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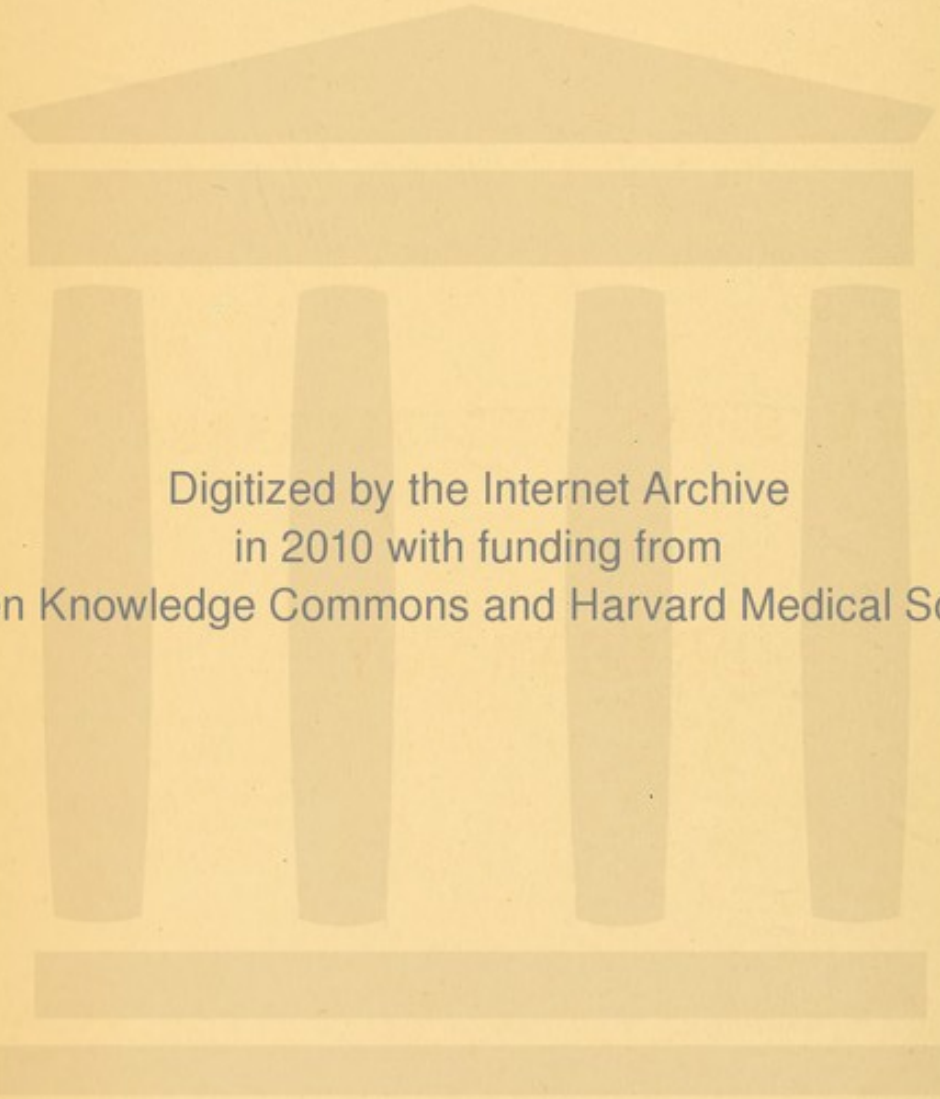

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THE SIGNS AND DISEASES

OF

PREGNANCY.

IMPORTANT NEW WORKS

ON THE DISEASES OF WOMEN.

I.

A COMPLETE PRACTICAL TREATISE ON THE DISEASES OF WOMEN. By T. Gaillard Thomas, M.D., Professor of Obstetrics and Diseases of Women and Children in the College of Physicians and Surgeons, New York; President of the New York Obstetrical Society, &c. In one very handsome octavo volume of 600 pages, with about 200 illustrations. (*Just Ready.*)

Summary of Contents.

Chapter I. History of Uterine Pathology.—II. Etiology of Uterine Diseases in America.—III. Diagnosis of Diseases of Female Genital Organs.—IV. Diseases of the Vulva.—V. Diseases of the Vulva (*continued*).—VI. Vaginismus.—VII. Vaginitis.—VIII. Atresia Vaginæ.—IX. Prolapsus Vaginæ.—X. Fistulæ of the Female Genital Organs.—XI. Fæcal and Simple Vaginal Fistulæ.—XII. General Remarks on Inflammation of the Uterus.—XIII. Acute Endo-Metritis and Acute Metritis.—XIV. Cervical Endo-Metritis.—XV. Chronic Cervical Metritis.—XVI. Chronic Corporeal Endo-Metritis and Metritis.—XVII. Ulceration of the Os and Cervix Uteri.—XVIII. General Considerations on Displacements of the Uterus.—XIX. Ascent and Descent of the Uterus.—XX. Versions of the Uterus.—XXI. Flexions of the Uterus.—XXII. Inversion of the Uterus.—XXIII. Peri-Uterine Cellulitis.—XXIV. Pelvic Peritonitis.—XXV. Pelvic Abscess.—XXVI. Pelvic Hæmatocele.—XXVII. Fibrous Tumors of the Uterus.—XXVIII. Uterine Polypi.—XXIX. Cancer of the Uterus.—XXX. Cancroid Tumors of the Uterus.—XXXI. Epithelial Cancer of the Uterus.—XXXII. Diseases resulting from Pregnancy.—XXXIII. Dysmenorrhœa.—XXXIV. Menorrhagia and Metrorrhagia.—XXXV. Amenorrhœa.—XXXVI. Leucorrhœa.—XXXVII. Sterility.—XXXVIII. Amputation of the Cervix Uteri.—XXXIX. Diseases of the Ovaries.—XL. Ovarian Tumors.—XLI. Ovariotomy.—XLII. Ovarian Tumors (*continued*).—XLIII. Diseases of the Fallopian Tubes.

II.

ON DISEASES PECULIAR TO WOMEN: INCLUDING DISPLACEMENTS OF THE UTERUS. By Hugh L. Hodge, M.D., late Professor of Midwifery, &c., in the University of Pennsylvania, &c. With Illustrations on Wood. In one beautifully printed octavo volume of about 500 pages.

Summary of Contents.

PART I. Diseases of Irritation.—Chapter I. Nervous Irritation and its consequences. II. Irritable Uterus—Complications. III. Local Symptoms of Irritable Uterus. IV. Local Symptoms of Irritable Uterus. V. General Symptoms of Irritable Diseases. VI. General Symptoms of Irritable Uterus—Reflex Influences of Cerebral and Spinal Irritation. VII. Progress and Terminations of Irritable Uterus. VIII. Causes and Pathology of Irritable Diseases. IX. Treatment of Irritable Uterus—Removal or Palliation of the Cause. X. Treatment of Irritable Uterus—to Diminish or Destroy the Morbid Irritability. XI. Treatment of Irritable Uterus—modified by Menstrual Disorders and Inflammations. XII. Treatment of Irritable Uterus, Complicated with Secondary and Sympathetic Symptoms.

PART II. Displacements of the Uterus.—Chapter I. Displacement of the Uterus. II. Causes and Symptoms of Displacement of the Uterus. III. Diagnosis of Displacement of the Uterus. IV. Treatment of Displacement of the Uterus. V. Treatment, continued—Internal Supporters. VI. Treatment, continued—Lever Pessaries. VII. Treatment, continued. VIII. Treatment of Complications of Displacements.

PART III. Diseases of Sedation.—Chapter I. General and Local Sedation. II. Sedation of Uterus. III. Diagnosis and treatment.

III.

LECTURES ON THE DISEASES OF WOMEN. By Charles West, M.D., F.R.C.P., Accoucheur to and Lecturer on Midwifery at St. Bartholomew's Hospital, &c. Third American, from the Third and Revised English Edition. In one handsome octavo volume of about 550 pages. Extra cloth, $3.75; Leather, $4.75. (*Now Ready.*)

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As a sound practical treatise, based on the extended experience of a close and accurate observer whose views and acquirements are quite *au niveau* with the present state of medico-obstetrical science, this work is fairly entitled to the highest rank; and as such, we strongly and heartily commend it to the attention of our professional brethren.—*The Dublin Quarterly Journal of Medical Science.*

The manner of the author is excellent, his descriptions graphic and perspicuous, and his treatment up to the level of the time—clear, precise, definite, and marked by strong common sense.—*Chicago Med. Journal.*

HENRY C. LEA, Philadelphia.

ON THE

SIGNS AND DISEASES

OF

PREGNANCY.

BY

THOMAS HAWKES TANNER, M.D., F.L.S.,

Member of the Royal College of Physicians, &c.

From the Second and Enlarged London Edition.

WITH FOUR COLORED PLATES,

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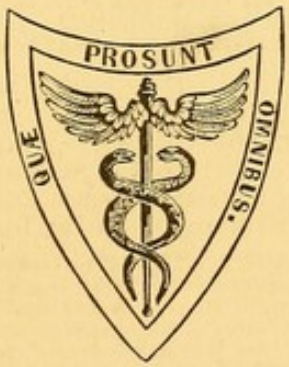

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TO

THE FELLOWS

OF

THE OBSTETRICAL SOCIETY OF LONDON,

AND TO THE MEMORY OF THEIR FIRST PRESIDENT,

(1859, 1860,)

EDWARD RIGBY, M.D., F.L.S.,

&c. &c. &c.

THIS VOLUME

Is with great Respect Inscribed.

PREFACE.

THE first edition of this work was published in 1860. During the seven years which have now elapsed, the subjects treated of in the following pages have been constantly brought under my notice. It is to be hoped that the experience thus gained will be found serviceable to my readers.

In preparing this edition for the press, the original plan has been adhered to of enforcing the general principles of the subject by the narration of illustrative cases. Attaching great importance to clinical teaching, I have repeatedly ventured to carry the student, in imagination, to the bedside. And if I have there endeavored to act as his guide, and to show him how to recognize and treat the various diseases to which pregnant women are subject, it is hoped that this attempt has always been made in a proper spirit.

HENRIETTA STREET, CAVENDISH SQUARE,
1st October, 1867.

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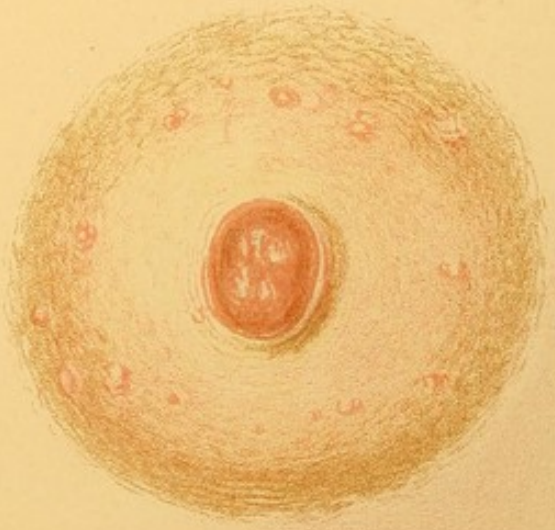


Areola in the third calendar month.

A J Robertson del.

T Sinclair sculp Edin.

Areola in the sixth calendar month

A. J. Boetson del.

T. Sinclair's Lith. Phila.

Plate III

Areola in the ninth calendar month.

A.J. Dodson del.

T. Sinclair's Lith. Phila.

Areola in the ninth calendar month

A.J. Peterson del. J. Sinclair lith. Phila.

THE

SIGNS AND DISEASES OF PREGNANCY.

CHAPTER I.

GENERAL OBSERVATIONS ON THE STATE OF PREGNANCY.

1. Introductory remarks—The clinical study of disease—Importance of auscultation in detecting pregnancy.—2. Definition of pregnancy—The varieties.—3. The limits of the generative faculty in women and men—Examples of precocious menstruation, early pregnancy, etc.—4. An inquiry into the number of children a woman can bear.—5. Multiple births—Fabulous tales—Statistical facts.—6. Age at which women are most prolific.—7. Anxiety of men to discover the sex of the fœtus while it is still in the uterus.—8. Statements of patients in doubtful cases—Simulated pregnancy and labor—Concealed pregnancy—Women not always aware of their condition.—9. Brief remarks on the function of reproduction as it is effected in the various classes of the animal kingdom.—10. Mode in which pregnant women should be treated—Mortality from childbirth—Means to be adopted to lessen the dangers of parturition.

1. An elaborate argument is quite unnecessary to prove that few subjects connected with obstetric medicine can be of much greater interest or importance than the consideration of the signs and symptoms indicative of pregnancy. During the early months, when the development of the uterus is inconsiderable, the difficulty of forming a correct opinion as to the existence of a fecundated ovum in the uterine cavity is acknowledged to be great. But the delicacy of the question only renders its study the more imperative. The physician, in giving his opinion on any doubtful case of pregnancy, can seldom do so without incurring a serious responsibility; for very disastrous results to the mental and physical well-doing of the patient may follow from an erroneous diagnosis. Hence, great caution is always

to be exercised; while it is imperative that the practitioner make himself well acquainted with those general rules which ought to guide him in drawing his conclusions. To advise that frequent opportunities should be sought for verifying the statements contained in the following pages might be deemed impertinent by those who I trust will try to glean information from this volume, since every tyro in midwifery is aware that knowledge derived from reading is of little value by itself. The remark of Dryden, that books are to be regarded as spectacles with which to read Nature, applies peculiarly to medical writings. Indeed no one will be found to deny, that he who would become skilful in the diagnosis of disease, in the present day, must combine the study of the literature of our profession with the personal observation of the sick. For although a certain delicacy of the senses, with the capability of distinguishing between various slight impressions, can be acquired by practice alone, yet the *tactus eruditus*, or faculty of properly interpreting these differences, demands a knowledge and consideration of the subject in all its bearings.

It was long since well said by D'Alembert, that the physician is not—as is the vulgar opinion—he who cursorily and without discrimination accumulates facts in the course of a large practice; but rather the man who exercises great scrutiny and penetration in making his investigations, and joins to what he has himself observed an acquaintance with the far greater number of observations that have been made in all ages by men animated with the same healthy impulse. Such knowledge constitutes the true *experience* of the physician. Believing implicitly in the truth of this remark, I need hardly say that it has been my endeavor to act up to its spirit. The attempt has been generally made on my own part to render each case met with in practice a study in itself; to compare it not merely with like examples previously under treatment, but also with recorded instances in any way bearing upon it; as well as to note minutely the effects of the different remedies employed. In pursuing this plan, the greatest assistance has been derived from reading the writings of those masters of our profession who have published the well-considered results of their experience; and having had greater opportunities for practically studying the diseases to which women are liable during pregnancy than fall to the lot of many, I have felt that a

debt has been incurred by me. How far I have been successful in partly repaying this obligation, my readers must judge for themselves while perusing this volume.

The author of the imperishable treatise *De l'Auscultation Médiate, ou Traité du Diagnostic des Maladies des Poumons et du Cœur*, has not only claims upon our gratitude for the light which his genius has thrown upon the diseases of the chest, but also for the results which have flowed from his discoveries, in enabling us materially to simplify the diagnosis of pregnancy. In the middle of the nineteenth century, such an impostor as Joanna Southcott would be detected immediately; and no woman could now—as this "chosen vessel" succeeded in doing in 1814—lead medical men to state that a distended urinary bladder, or a flatulent colon, was an impregnated uterus at the sixth or seventh month of gestation. The charlatan and plausible quack will still find followers and admirers, it is true; for without a doubt gross credulity and superstition even yet reign supreme over many imperfectly educated or weak minds. But it is probably less injurious in a moral point of view to put faith in table-turning, clairvoyance, spirit manifestations, and infinitesimal doses of drugs, than to believe—as many thousands did—that a silly old woman has been impregnated by supernatural influence, and that she is about to be delivered of the Holy Ghost personified!

The advantages to be derived from the practice of auscultation, not only in detecting pregnancy but also in deciding upon the life or death of the fœtus, are now so manifest, that it is surprising they were not at once appreciated. Yet, just as Laennec was laughed at for using the stethoscope in the years 1818 and 1819, at the Parisian Hospital Necker, so attempts to hear the pulsations of the fœtal heart were deemed useless and ridiculous; and many years elapsed before the authors of systematic works on midwifery thought proper to speak of the practice of auscultation. In looking back to the history of science and art, it is curious to observe with what pains some men step aside from their accustomed duties to oppose the progress of knowledge; and yet in spite of their industry, and often of their great—though misdirected—abilities, how ultimately futile are their efforts. Any one who attempts to benefit his fellow-men by the promulgation of some novel fact, must make up his mind to meet with antagonism; and happy will he be, if—his private character escaping

abuse—he have to submit to no further opposition than is implied in the assertion that his discovery is either useless or obsolete.

The following opinion of Dr. Lyall, on a subject of which he confesses himself to have been ignorant, now merely excites our contempt or laughter, though doubtless it had some little weight when written. He observes: "Of the utility or uselessness of auscultation, in discovering pregnancy, we have had no experience. It is said that the operation may be performed, either by applying the ear to different parts of the abdomen, or by using the stethoscope of Laennec. Reasoning *à priori* we anticipate little advantage from such an examination."[1]

More extraordinary, because promulgated ten years subsequently, was the view taken by Dr. James Hamilton, the Professor of Midwifery in the University of Edinburgh, who gives some curious reasons for not investigating the subject of obstetric auscultation. The chief are, that he never adopted new modes of practice when experience had taught him that the old ones were successful; that,—"in the better ranks, no prudent practitioner would have recourse to means calculated to excite alarm in the patient, and surely the ceremony of applying the stethoscope must be very formidable to susceptible females;" that he believed there "must be some fallacy in the observations of those who have supposed that the stethoscope can detect the pulsations of the fœtal heart;" and lastly, admitting that the placental souffle and fœtal heart can be heard by the stethoscope, "he is convinced that few cases can occur in actual practice where this test can be required, or can be applied."[2] But if these remarks of Lyall and Hamilton call forth our wonder, what will be the feeling raised by a perusal of the doubts entertained by Dr. Francis Adams, in the year 1859, on the question of fœtal auscultation. This gentleman—the learned translator of the works of Paulus Ægineta—believed that success in detecting the sounds of the fœtal heart depends in a great measure upon the circumstance whether or not the auscultator considers that he ought to

[1] The Medical Evidence relative to the Duration of Human Pregnancy, as given in the Gardner Peerage Cause before the Committee of the House of Lords in 1825–6. With Remarks and Notes by Robert Lyall, M.D., &c. Introduction, p. 20. London, 1826.

[2] Practical Observations on Various Subjects relating to Midwifery. Part I, pp. 154, 158, and 166. Edinburgh, 1836.

detect them; and he asserted—"that the whole system of fœtal auscultation originated soon after the dawn of general auscultation, when men's minds were excited by the love of novelty, and warped by many erroneous impressions and mistaken modes of thinking; and has since been mainly upheld by authority."[1]

Whether Dr. Adams died before his mistake was made clear to him, I do not know; but he published no other papers on this subject than these referred to. It is, however, much to be regretted that because this excellent scholar could not hear the sounds of the fœtal heart in one particular instance, he should therefore have jumped to the conclusion that physicians more skilful than himself were merely the victims of their imaginations; and I cannot but think his papers would never have been written had he only taken the trouble to visit the wards of one of our lying-in hospitals before sitting down to his desk. Much in the same unhealthy antagonistic spirit as that manifested by these gentlemen, a portion of the British public—and not an uninfluential section either—met together one evening in the month of March, 1808, to discuss the question: "Which has proved a more striking instance of the public credulity, the gas lights of Mr. Winsor, or the cow-pox inoculation?" The orators of course proved conclusively that both gas-lights and vaccination should be regarded with contempt and ridicule as gross absurdities. Let us learn from all this not to put our trust in mere *à priori* arguments, nor allow ourselves to be swayed by that aversion to all innovation which seems so peculiarly to afflict the medical mind after the age of forty; but rather, without encouraging a weak gullibility, to carefully weigh and practically test the opinions of other men. "There are some," says Sydenham, "who, adding nothing to medicine of their own, are angry at the most trifling addition of another." If any such there be in the present day, let them think upon the advice of old Mauriceau to his readers, which may be as advantageously acted upon now, as when it was written: "Since in the age we live we see most people governed rather by opinion than judgment, I desire (if you mean to profit by my book) you will read and examine it without *Critical Envy*, free from all *preoccupation* that may obscure your judgment, and hinder your acknowledging the truth of what I pro-

[1] Medical Times and Gazette, p. 402. London, 22d October, 1859: p. 615, 17th December, 1859: and p. 66, 21st July, 1860.

fess to teach. Therefore, follow not such as *condemn a conception* when they *understand it not*, and believe it *false* because it is *new;* neither imitate those who seeking only to carp at *words*, neglect the *sense* of the discourse."[1]

2. Pregnancy may be defined as the condition of a woman who has conceived, and bears within her body the product of conception. It extends from the moment of conceiving until the expulsion of the ovum or fœtus; whether this take place prematurely, or at the proper period when the nine calendar months of gestation have elapsed. There are two kinds of pregnancy, viz., uterine and extra-uterine; in other words, the ovum may be developed within the uterine cavity, or outside the womb. Uterine pregnancy is conveniently divided by French authors into three kinds: The *simple*, where there exists but one fœtus; the *compound*, where there are two or more children; and the *complicated*, where, together with a fœtus, there coexists some pelvic or abdominal tumor, or some structural disease of the uterus, rendering the diagnosis difficult. The term *pseudo-pregnancy* is also sometimes applied to diseases which simulate pregnancy; and though such an expression should hardly have a place in any scientific nosology, yet we shall subsequently find that it is very difficult to propose a good substitute.

3. The limits of the generative faculty in women are those of the function of menstruation; *i. e.*, from about the fourteenth or fifteenth to the forty-fifth or forty-eighth year. Some few girls, however, menstruate as early as the eleventh, twelfth, or thirteenth year; and about a dozen extraordinary cases are to be found scattered through medical literature in which children have had the catamenia appear when only two, three, and five years of age. The most recently recorded cases of this kind with which I am acquainted are the two following. The chief facts in the history of the first example are these:

Mary Deane was born at Manchester on the 7th January, 1853. In May, 1858, when examined by Mr. R. B. Smart, she was three feet seven inches high, and her weight—in her clothes—was fifty-two pounds and a half. Her

[1] The Diseases of Women with Child, and in Child-bed. Translated from the French of Francis Mauriceau by Hugh Chamberlen, M.D. 7th edition. Introduction, p. vii. London, 1736.

general appearance was wonderfully like that of an adult female, of short stature. The menses appeared every month as regularly as in their normal manifestations, and had done so since she was three years and six months old. The bust was full and womanly, the breasts larger and more protuberant than in most girls who have recently attained puberty, while the nipples were well-developed. The pubes was sprinkled over with light-brown hair about an inch in length; the mons veneris being prominent, the labia externa and nymphæ large, and the vagina capacious, with a fringe-shaped hymen. It need hardly be added that the intellectual and moral faculties exhibited no signs of precocity at all commensurate with the forward development of the body. For six months prior to the appearance of the catamenia the child seemed ailing, she had a leucorrhœal discharge, and complained of headache and drowsiness, with pains in the back and groins; but since the first menstrual flow she had gained in flesh, and been hearty and well. The catamenia generally lasted four days, and were natural in quantity.[1]

The second instance is still more remarkable. As the child died, it is much to be regretted that no examination of the body was allowed after death, for the condition of the uterus or ovaries might have thrown some light on the cause of the phenomena. The principal points in the case, as recorded by Dr. T. C. Allbutt, are as follows:

M. A. W. was seen in the summer of 1865, and was reported to have menstruated within the last few days. Her age was one year and six months. She was then suffering from emaciation, weakness, quick pulse, and other indications of hectic fever. These symptoms passed off in a few days, and she partially recovered her health. On examination the anal and genital regions were found free from discharge, and quite healthy in appearance. On the following month the discharge again appeared, and after it had passed away Dr. Allbutt found her as before—in a state of hectic, and still presenting a perfectly healthy appearance about the anus and pudenda. He was unfortunately unable, being absent from home for a while, to see her during the continuance of the flow. In about a fortnight, some degree of health had been again recovered. On many occasions the child was carefully examined for disease in other organs, but nothing could be found of any importance. At the third monthly period, Dr. Allbutt actually saw the child in a menstruating state. The flow appeared with curious accuracy at the month, and lasted about two days and a half. The discharge was sanguineous, and in every way resembled that of a girl at puberty; except that it was more scanty in quantity.

A return of the hectic fever followed, and the child's life was endangered. She recovered, but only to be again prostrated by a fourth appearance; while after a fifth she died, wasted and exhausted, without any effort to rally. There were no other signs of premature puberty. A post-mortem examination could not be obtained.[2]

But, it may be said, cases like these are mere violations of the

[1] Medico-Chirurgical Transactions, vol. xli, p. 455. London, 1858.
[2] Medico-Chirurgical Transactions, vol. xlix, p. 161. London, 1866.

usual law, and ought not to be taken into consideration when treating of the subject of menstruation generally. This is no doubt true. They are analogous to the nondescript cases of very early puberty in male children, instances of which have been transmitted to us since the days of Pliny, whose *Historia Naturalis* is preserved to us.[1] And moreover, in the second girl there may have existed some ovarian disease, though not sufficiently advanced to allow of detection during life. Thus, a child under my own care had a discharge of blood from the vagina when a little more than nine years of age; this discharge being regarded by the mother as an ordinary monthly period. At this time the young girl appeared in good health, although shortly afterwards symptoms of ovarian cancer set in, and ultimately proved fatal. Putting aside, therefore, these deviations from the natural course, it can be shown that the majority of young women have their menses for the first time between the fourteenth and sixteenth years. An examination of numerous English, French, and German tables leads me to infer, that if the histories of 5000 women were taken, it would be found that the catamenia first appeared in these at the following ages:

Between the tenth and eleventh year,	in	50
Between the eleventh and twelfth year,	"	200
Between the twelfth and thirteenth year,	"	350
Between the thirteenth and fourteenth year,	"	600
Between the fourteenth and fifteenth year,	"	900
Between the fifteenth and sixteenth year,	"	1000
Between the sixteenth and seventeenth year,	"	715
Between the seventeenth and eighteenth year,	"	500
Between the eighteenth and nineteenth year,	"	350
Between the nineteenth and twentieth year,	"	170
Between the twentieth and twenty first year,	"	100
Between the twenty-first and twenty-second year,	"	40
Between the twenty-second and twenty-third year,	"	12
Between the twenty-third and twenty-fourth year,	"	8
Between the twenty-fourth and twenty-fifth year,	"	4
Between the twenty-fifth and twenty-sixth year,	"	1
		5000

Cases in which conception takes place before the age of fourteen years are certainly very rare. A few remarkable examples of early maternity are, however, on record. According to Paris and Fonblanque, some girls were admitted, during the year 1816, into the Maternité at Paris, as young as thirteen years; while

[1] A remarkable case of premature puberty in a boy two-and-a-half years of age, with references to similar histories, will be found in the Medico-Chirurgical Transactions, vol. i, p. 278. London, 1809.

during the Revolution one or two examples occurred of females at eleven, and even below that age, being received in a pregnant state into that hospital. Schurigius states the case of a Flemish girl, who was delivered of a son at the age of nine years; and in the notes to Metzger several instances are related where conception had occurred under the age of ten.[1] The most precocious instance of pregnancy with which Dr. Montgomery was acquainted, was that of a young lady who brought forth twins before she had completed her fifteenth year.[2] The earliest age at which Dr. Goodeve, Professor of Midwifery at Calcutta, has known a Hindoo woman bear a child is ten years; but this gentleman says that he had heard of one at nine. A large portion of Hindoo women bear children before they are fifteen years old. The ordinary age at which, in Bengal, women commence menstruation is twelve years.[3] Dr. Josiah Curtis has related the history of a girl aged ten years and eight months, who was delivered of a healthy child at the full term of pregnancy. The chief particulars of this case were obtained from Mr. Presbury, one of the overseers of the poor, in the town of Taunton, United States; and from Dr. Alfred Baylies, of Taunton. The facts are as follows:

Mr. P. says (15th November, 1858): Elizabeth Drayton was born at the Almshouse in this town, 24th May, 1847. So says the record in the old family Bible belonging to that establishment, and so also says Dr. Alfred Baylies, who was with the mother when Elizabeth was born. The entry in his book also corresponds with the time and circumstance. Dr. Baylies was also with Elizabeth on the first day of February last, when this male child was born, a nice, full-grown, plump baby, weighing eight pounds, good weight. These are facts, against which there does not exist the shadow of a doubt.

The reputed father of this child is a lad said to be about 16 years old, who belongs to the State of Maine. There are some circumstances in this case which go to prove that this precocious girl was pregnant twenty-four days before she was 10 years old. On the first day of May, 1857, they were detected in their illicit pleasures by his aunt, who lives in Norton, with whom she had lived two years or more, and to whose house he had come to make a visit of two or three weeks. Immediately after they were caught together, the boy was sent home forthwith to his father, who resides in Bangor, Me. The child was born the first day of February, 1858, leaving a space of just nine months. He is a fine little fellow, of a very handsome model, hair

[1] Medical Jurisprudence. By J. A. Paris, M.D., and J. S. M. Fonblanque, Barrister-at-Law, vol. i, p. 257. London, 1823.

[2] An Exposition of the Signs and Symptoms of Pregnancy. Second edition, p. 314. London, 1856.

[3] Essays and Notes on the Physiology and Diseases of Women, and on Practical Midwifery. By John Roberton. P. 118. London, 1851.

curls a little, has a bright blue eye, and to all human appearance he has the essential elements in him to make a great man. His growth thus far corresponds with his age. The mother is a fleshy, healthy girl, and rather larger than girls of her age.

Dr. B. (20th December, 1859) gives the same dates as Mr. P. for the birth of the mother and her child, and says: They are of pure Yankee blood, and in fine health. The mother menstruated once or twice before conception, was of good size for her age, and was tolerably healthy during gestation, but had a rather lingering time at her confinement, which lasted two or three days, though perfectly natural. The child weighed at birth 8 pounds, and to-day he weighs 37½ pounds. The child was nursed by his mother until last March, at which time he was weaned; though from paucity of nourishment he was fed somewhat after three months. The reputed father of this child was, at the time of conception, between 16 and 17 years of age. The warden of our Almshouse, both he and his wife, Mr. and Mrs. Bassett, think the little boy uncommonly smart, and in appearance he beats all the boys of his age that I have seen. He appears well formed, and of great muscular strength.[1]

The earliest age at which I have known a patient to be delivered is between the thirteenth and fourteenth year, the lady being a native of Hayti married to an English gentleman. In the preparation of a table of the births in Glasgow, during the year 1865, it was found that five of the mothers were in their sixteenth year. One mother, only eighteen years old, had 4 children; and another woman, twenty-two years old, had 7 children. One of the mothers, who had borne 13 children, was only in the thirty-fifth year of her life; and the youngest mother of 14 children was only thirty-four years of age.[2] In England, in one instance at least, pregnancy is positively known to have occurred at eleven years. The case is recorded by Mr. Roberton, of Manchester:

A girl who worked in a cotton factory became pregnant in her eleventh year. When in labor she was seized with convulsions; but was delivered of a full-grown still born child without unusual difficulty, and she recovered favorably. Mr. Thorpe, who attended the girl, was at the trouble of examining the registers of her birth and christening; and he satisfied himself that she had conceived in the eleventh year of her age, and that at the time of her delivery she was only a few months advanced in her twelfth year. Her figure was that of a well-grown young woman; her mammæ were fully developed; and it was proved that she had menstruated before she became pregnant.[3]

[1] The Boston Medical and Surgical Journal, vol. lxviii, No. 3, p. 49. 19th February, 1863.

[2] Second Detailed Annual Report of the Registrar-General in Scotland. P. 18. Edinburgh, 1861.

[3] Essays and Notes on the Physiology and Diseases of Women, and on Practical Midwifery. By John Roberton. P. 30. London, 1851.

The following is a second example of early pregnancy, the mother being twelve years and seven months old at the time of her labor:

At the Coventry assizes of August, 1848, Julia Sprayson preferred a charge of rape against her uncle, who was convicted of the assault, and sentenced to two years' imprisonment. This girl began to menstruate when ten years and six weeks old; and it was distinctly ascertained that there had been a regular return of the catamenial discharge, in somewhat profuse quantity, up to the period at which conception took place. The criminal intercourse first occurred about the middle of November, 1847, and was repeated on four occasions, at weekly intervals; but as the catamenia had appeared during the last week of that month, and did not recur in the Christmas week, she dated conception from the latter period. She was delivered of a healthy but rather small child on the 16th September, 1848, after a short and favorable labor. Mr. John Smith, who attended her, took the trouble of consulting the registers both of birth and baptism; and he found the former to bear the date of 13th February, 1836, while the latter was the 7th March of the same year.[1]

Dr. Macdowall, of Helensburgh, N. B., delivered a girl thirteen years and six months old, of a full-grown female infant. Conception must, therefore, have occurred at the age of twelve years and nine months. The particulars of this case are as follows:

"On the 17th November, 1860, I was called," says Dr. Macdowall, "to visit J. W., a girl aged 13 years on the 4th of July last (according to the record of the family Bible), in consequence of some abdominal enlargement. I soon satisfied myself that the enlargement of the abdomen was due to pregnancy, and intimated my opinion accordingly to the relatives, who received the intelligence with much amazement and doubt. I watched the case from time to time; and as pregnancy is very uncommon at such an early age, I requested my friend Dr. J. G. Wilson, of Glasgow, to see the patient with me, who at once confirmed my diagnosis. On inquiry, I ascertained that the catamenia appeared for the first time in January, and that she menstruated regularly till the end of April. The patient appeared quite ignorant of her condition, and made no complaint.

"On 11th January, 1861, I received an urgent call to visit the girl, and on my arrival I found she had shortly before given birth to a full-grown female child. She could not have been more than three hours in actual labor. I should infer, from the way I found the infant lying in bed, that the presentation was natural. I at once detached the child and removed the placenta. The patient made an excellent recovery. The breasts (which had been suppurating previously) healed up, but without any appearance of milk. The lochial discharge was quite natural as to quantity, character, and duration. Four weeks after delivery the mother and child were transferred to a

[1] London Medical Gazette, p. 751. 3d November, 1848.

neighboring county, and shortly afterwards the child died, I presume from bad nursing. The age of the lad who acknowledges the paternity is 19 years."[1]

The early marriages of the more precocious natives of tropical climates have long attracted the attention of the physiologist, as have also the marriages of mere children in the Arctic regions. Amongst the Esquimaux, young couples have been seen living together as man and wife, where the latter could not have been above twelve or thirteen years old. But it is not as generally known, that in former days marriage often took place in Scotland at a very early age. David Calderwood notices an Act of Assembly passed in 1600,—"to correct divers and great inconveniences arising by the untimeous marriage of young and tender persons;" and ordaining "that no minister presume to join in matrimony any persons in time coming, except the man be fourteen years of age, and the woman twelve complete."[2] Mr. Robert Chambers also, quotes from the Chronicles of Perth, under the date of 29th August, 1618, the following: "Mr. John Guthrie, minister of Perth, on ane Sunday after the afternoon's sermon, married the Master of Sanquhar with Sir Robert Swift's daughter, ane English knight, in Yorkshire. Neither of the parties exceeded thirteen years of age."[3] In the same work, the following instance also occurs,—9th February, A. D. 1659, the Countess of Buccleugh, a child eleven years of age, was married to Walter Scott, a youth of fourteen.

About 2200 years have elapsed since Aristotle taught, that premature wedlock is peculiarly dangerous to women; inasmuch as many of them suffer greatly in childbirth and several die. The truth of this observation has frequently been confirmed. It was shown, for example, by Burns that when a girl early becomes a mother, the imperfect shape of the pelvis alone may occasion a painful and tedious labor. The result to the offspring in these precocious unions is also apt to be unfavorable, either as regards duration of life, or the physical and mental development. Probably, therefore, it is a safe assertion to make, that no woman under twenty years of age should be allowed to marry. And yet it is a remarkable fact, that according to the present laws of

[1] Edinburgh Medical Journal, p. 332. October, 1861.

[2] True History of the Church of Scotland, from the beginning of the Reformation unto the end of the Reign of James VI, vol. vi, p. 24. Edinburgh, Wodrow Society, 1842-9.

[3] Domestic Annals of Scotland, from the Reformation to the Revolution. Second edition, vol. i, p. 505. Edinburgh and London, 1859.

England, a girl may marry at the age of twelve, and a boy at that of fourteen, provided the consent of the parents and guardians be obtained. Of course it is not supposed that unions at these very early years do take place. But still it is a matter without doubt, that in the year 1864, there were married in England, 11,934 men and 36,235 women, all of whom were "under age,"—that is to say, they had not attained the full term of twenty-one years.

When the menstrual flow has once fairly ceased at any age between forty and fifty, it does not necessarily follow that it has permanently stopped. Dr. Tilt mentions the instance of a lady in whom menstruation ceased at forty-five, was absent for two years, then returned with regularity, and was followed by pregnancy at fifty. The same author refers to a case cited by Capuron, where the menses are said to have returned at sixty-five, after being absent for several years; the patient becoming pregnant, and aborting three months afterwards of a well-formed fœtus.[1] I think Haller states that he delivered one woman in her sixty-third and another in her seventieth year. Such instances as these are almost incredible. But it is as well to bear them in mind; and still more not to infer in any given case that pregnancy does not exist, simply because "the change of life" has previously taken place, or for the reason that the patient's age is above fifty. The latest period at which parturition, at the full term of gestation, is satisfactorily known to have taken place is probably fifty-four; although in Glasgow, in 1855, one mother was registered as having given birth to a child in the fifty-seventh year of her age.[2]

Dr. Carpenter, of Durham, says that he has attended several women in their confinements whose ages were fifty. He remarks: "I well remember a case occurring in my father's practice, in 1839, where a woman became a widow at 49 years of age. Shortly afterwards she married her second husband, and within twelve months of this time gave birth to her *first* child. These cases belong to the working classes. But I know of two others, where

[1] The Change of Life in Health and Disease. By Edward John Tilt, M.D. Second edition, p. 18. London, 1857.

[2] In the same city, during the same year, of the women who bore children, four were between 47 and 48 years old; five were between 48 and 49; two were between 49 and 50; two were between 51 and 52; and four were between 52 and 53 years of age. Second Detailed Annual Report of Registrar-General in Scotland. P. 18. Edinburgh, 1861.

gentlewomen became mothers at 50; one with her first child, the other with her eighth. I can say nothing of how they menstruated; but I know of a virgin in whom the catamenia appeared *regularly* and undiminished up to and at the age of 60."[1] Mr. Henry Bloxam, of Portsmouth, has favored me with the particulars of a case, in which he delivered a patient of her first child, when she was 52 years of age. This lady had been married since her eighteenth year. The child was a fine healthy male, above the average size, and was suckled by his mother for the usual time. The labor lasted for sixteen hours, and was not attended with more than ordinary suffering.

In our Court of Chancery, the succession to a large property depended entirely on the question whether a woman might have a child at sixty years of age. The Attorney-General, Sir William Horne, stated that there was no such case satisfactorily recorded, and he offered to give up his client's title if any credible evidence could be produced in support of an instance; but as none was brought forward, he was deemed to have succeeded in proving his claim.[2]

The case is very different with the male sex, who may retain the generative power to a great age. As Lord Erskine asserted in his speech on the Banbury peerage trial,—"there is no statute of limitations on the powers and faculties of man;" and he quoted the instance of Sir Stephen Fox, who married at seventy-seven, and was the father of four children by the day he was eighty-one. Many other analogous cases might be quoted, but the following are the only two sufficiently interesting to merit notice: (1) In the Edinburgh Courant for 3d May, 1776, there is this paragraph: "Wednesday last, the lady of Sir William Nicholson, of Glenbervy, was safely delivered of a daughter. What is very singular, Sir William is at present ninety-two years of age, and has a daughter alive of his first marriage, aged sixty-six. He married his present lady when he was eighty-two, by whom he has now had six children." (2) Old Thomas Parr is said to have died on the 14th November, 1635, at the age of one hundred and fifty-two years and nine months. His body was examined two days subsequently by the illustrious Harvey, who reports that,—"the organs of generation were healthy, the penis neither retracted

[1] British Medical Journal, p. 552. London, 21st November, 1863.
[2] London Medical and Surgical Journal, vol. iii, p. 687. 29th June, 1833.

nor extenuated, nor the scrotum filled with any serous infiltration, as happens so commonly among the decrepit. The testes, too, were sound and large; so that it seemed not improbable that the common report was true, viz., that he did public penance under a conviction for incontinence after he had passed his hundredth year; and his wife, whom he had married as a widow in his hundred and twentieth year, did not deny that he had intercourse with her after the manner of other husbands with their wives, nor until about twelve years back had he ceased to embrace her frequently." This account was first published by Dr. Bett, who received the manuscript from Harvey's nephew. The entire report deserves perusal.[1]

4. The inquiry is sometimes made,—How many children can a woman bear? Dr. Szukits, in replying to this question, says that he has himself observed two women, each of whom had borne twenty-four children. Osiander refers to one woman who during her married life bore forty-four children; and to another who had fifty-three. Burdach mentions that the wife of a countryman in the Moscow district had given birth to sixty-nine children in twenty-seven confinements: viz., four times, four at one birth; seven times, three; and sixteen times, twins. In the Harleian MSS., Nos. 980–87, is the following extraordinary case, which is generally regarded as true:

"A weaver in Scotland had by one woman 62 children, all living till they wer baptized, of which ther wer but fower daughters onely, who lived till they wer women, and fourty-six sonns, all attaining to man's estate. During the time of this fruitfulness in the woman, her husband at her importunity absented himself from her for the space of 5 years together, serving as a soldier under the command of Captain Selby, in the Low Countries. After his return home, his wife was again delivered of three children at a birth, and so in her due time continued in such births till through bearing she became impotent. The certainty of this relation I had from Joh. Delavall, of Northumb' Esqr. who, anno 1630, rid about 30 miles beyond Edinburrough to see this fruitful couple, who wer both then living. Her stature and features he described to me then more fully. Ther was not any of the children then abiding with ther parents, Sir John Bowes and three other men of qualitie having taken at severall times ten of ther children a peece from them and brought them up. The rest were disposed of by other English and Scottish gent. amongst which three or four of them are now alive, and abiding at Newcastle, 1630."[2]

[1] De Ortu et Natura Sanguinis. Joanne Betto, M.D. Editio secunda, p. 320. Londini, 1692.

[2] Quoted from the History and Antiquities of Newcastle-upon-Tyne. By John Brand, M.A. Vol. ii, p. 454. London, 1789.

A Vienna newspaper, in the year 1809, contained the following announcement:

Maria Ann Helm, the wife of a poor linen-weaver, in Neulerchenfeld, has been married twenty years, and has borne, in eleven labors, thirty-two children. Of these, twenty-eight are living and four are dead: twenty-six are males, and six females; and all were begotten by one man, and nursed by herself. She had at her last confinement three children; one living and two dead. Her husband was a twin, she herself one of four; her mother gave birth to thirty-eight children, and died during a labor with twins.

Among the family portraits in the Palazzo Frescobaldi, at Florence, there is a full-length painting of a good-looking lady, with this inscription beneath it: "Dianora Salviati, moglie di Bartolomeo Frescobaldi, fece cinquantadue figli, mai meno che tre per parto." (Dianora Salviati, the wife of Bartolomeo Frescobaldi, gave birth to fifty-two sons, and never had less than three at a labor.)

The following histories are interesting, as examples of the fecundity of women in the present day:

Mrs. W., now a nurse in the London Hospital, was married in 1839, at the age of 21 years. In nineteen years (*i. e.* by 1858) she had borne twenty children, viz., eight *single* births, three times *twins*, and *triplets* twice.

Elizabeth D., of Old Montague Street, Brick Lane, was attended by one of the maternity pupils (Mr. Dyte), in her twenty-sixth labor. She had previously borne twenty-five children, all of them at full time, or near it.[1]

In the year 1857, I was consulted by a poor woman, the wife of a shoemaker, who stated that she had been pregnant twenty-five times in thirty-three years, and that she had given birth to nineteen living children. None of these, moreover, had been plural births. It is perhaps fortunate, that cases such as the foregoing are very exceptional; or otherwise some corrective to the redundance of mankind would be needed. The result even of giving birth to sixteen children may be very remarkable; as the following inscription on the tomb of a Robert Thompson, in Lenham Church, Essex, serves to show. This epitaph states that "He was grandchild to Mary Honeywood of Charing, who had at her decease 367 children lawfully descended from her: 16 of her own body, 114 grandchildren, 228 in the third generation, and 9 in the fourth." The third quarterly return of the Wycombe

[1] Clinical Lectures and Reports, by the Medical and Surgical Staff of the London Hospital. Vol. i, p. 208. London, 1864.

Registrar for 1863, records the death at Wendover of a woman 94 years old, who left a husband also 94; as well as 7 children, 46 grandchildren, 77 great grandchildren, and 3 great great grandchildren—133 descendants, who with herself formed five generations. She had lived in marriage over 74 years. Upwards of 60 of her relatives are said to have followed her to the grave.

The fruitfulness of marriages in different countries is liable to some variations. According to Burdach, the proportion of children born to each marriage in England is five to seven; in Germany, six to eight; in France, four to five; and in Spain and Portugal only two to three. With regard to England and France, I believe these numbers are now too high; the average in our own country being slightly above four children for each marriage, and in France only about three. The same physiologist likewise says that one marriage out of fifty is unfruitful; that there is one birth on an average for every twenty-five of the population of a place; and that, taking the whole population of the world at six hundred and thirty-three millions, about fifty-one children are born every second. Great difficulty is experienced in obtaining any accurate returns of the proportion of unproductive to productive marriages; but with regard to Great Britain it will possibly be nearly correct to say that one marriage in every ten is without issue.

In 1864 there was one child born alive, in England, to every 28 persons living; the birth-rate in this year being the highest experienced since the commencement of registration. The total number of births registered, amounted to 740,275; the males being in the proportion of 104.2 to every 100 females. The natural increase of the population in England, during this year, by the excess of births over deaths, was 244,744, or at the rate of 669 daily.

At the first blush it might be supposed that the greater the facilities for bringing up children, the greater would be their rate of increase; and that the rich consequently would be more prolific than the poor. Hippocrates did not leave unnoticed the fact, however, that the labor and privation of the lowest sphere of life were just as favorable to fertility, as the indolence and affluence of the highest were adverse to it; and it still remains true that the poorest and most industrious part of mankind are the most fruitful. Among the British peers, in 1833, there were 503 existing

marriages, of which no fewer than 102 had no issue.[1] What is the explanation of this remarkable fact? Is it true, as Adam Smith following the doctrine of Hippocrates suggests, that luxury, while it probably increases the passion for enjoyment, seems always to weaken, and frequently to destroy altogether, the powers of generation? Dr. Short certainly entertained this view, for he went so far as to attribute the great prolificness of the Israelites in Egypt, as a secondary cause, to their bondage and affliction; and he even attempted to prove that in his day the most laborious and toilsome months of the year were the most fruitful in conceptions. A more enlightened and comprehensive consideration of the subject, however, shows us that these explanations will not entirely suffice. The true reason, it has been suggested, is in all probability this,—that a large proportion of the upper classes possess unhealthy or feeble constitutions, which are unfavorable to increase; and it is this circumstance which explains why so many of our old families have died out. Throughout the higher ranks of society most of the children are reared. Among the lower classes more than one-half perish before the fifteenth year is attained; while in numerous unhealthy towns, one-half of all who are born to the lower orders are cut off before they reach their fifth year. The natural physiological consequence of this is, that among the adults of the higher classes there exists a much larger proportion of individuals of feeble frames than among the lower classes. It has also been shown that throughout the whole of Europe, marriages are less prolific in large than small towns, and less again in these than in the rural districts.

There is a very prevalent opinion that marriages between near relations are undesirable, so that the remark is proverbial—"The marriage of first cousins proves either healthless, wealthless, or childless." Certainly, recent observations seem to show that such unions are relatively more completely sterile, or lead to more frequent abortions, than is the case in mixed marriages; or, if these intermarriages are prolific, that the offspring will more than ordinarily be the subjects of some arrest of development, or will exhibit a physical and intellectual feebleness. Hence, the children born from these intermarriages are more liable to early death, or to strumous affections, malformations, blindness, and deaf-mutism,

[1] Journal of the Statistical Society. Vol. xiv, p. 79. London, 1851.

than infants begot by individuals not related by blood to each other. And even if the first generation be spared, the injurious influence of consanguinity may show itself subsequently; while when these unions are continued for several generations, the family often steadily degenerates until it finally becomes extinct.

The number of children born out of wedlock in England is rather more than six per cent. of the total number of births. According to the Registrar-General, of 1000 children whose births are registered in England 65 are illegitimate; while of the same number registered in Scotand 89 are illegitimate (1856–60).[1] Parent-Duchatelet states that in a thousand prostitutes there will scarcely be six deliveries in the course of a year; but Marc asserts that not more than two or three mature children are born from two thousand prostitutes in the same space of time. Illegitimate children are also said to be more frequently malformed than the legitimate.

5. The various fictions which have been published as to the number of children which a woman can bear at one labor, at least afford evidence of the great inventive powers of authors. From an early period men seem to have taken a pleasure in publishing these tales, as the few following show. Pliny tells us, in the third chapter of the seventh book of his Natural History, that in Egypt as many as seven children were occasionally produced at one birth; and Seneca says it is an acknowledged fact, that the waters of the Nile possess the property of promoting fecundity. Albucasis mentions that not only may four, five, six, seven, or ten children be formed in the womb; but that in one case of abortion he has known of seven fœtuses being expelled, and in another of fifteen, all well formed.[2] Petrus Borellus records that a lady, the wife of the noble D. Darre, produced at one birth, in the year 1650, eight perfect children.[3] Paré, "a man of much experience, some erudition, and not a little credulity," relates that in his time there was the lady of a nobleman called Maldemeure, residing near Chambellay, who produced twins the first

[1] Twenty-seventh Annual Report of the Registrar-General of Births, Deaths, and Marriages in England. P. 22. London, 1866.

[2] Gynæciorum sive de Mulierum tum communibus, tum gravidarum, parientium et puerperarum affectibus et morbis, libri veterum et recentium. Israel Spachius. P. 444. Argentinæ, 1597.

[3] Petri Borelli, Medici Regii Castrensis. Centuria 2. Observatio xliv, p. 143. Paris, 1656.

year of her marriage; triplets the second; quadruplets the third; quintuplets the fourth; and sextuplets the fifth year, of which number only one survived. The mother died after this delivery.[1] Mauriceau's opinion of the following history will hardly be disputed: "But I esteem it either a miracle or a fable, what is related in the history of the Lady Margaret, Countess of Holland, who in the year 1713 was brought to bed of 365 children at one and the same time; which happened to her (as they say) by a poor woman's imprecation, who asking an alms, related to her the great misery she was in by reason of those children she had with her. To which the lady answered, *She might be content with the inconvenience, since she had had the pleasure of getting them.*"[2] Paré, referring to this case, completes the history, and states that 182 of the children were said to be males, as many females, and the odd one an hermaphrodite. The infants were baptized in two brazen dishes, by Don William, Suffragan Bishop of Treves; the males having the name of John bestowed on them, and the females that of Elizabeth. It might be thought that the force of imagination could hardly produce anything more remarkable than the foregoing; but these cases are insignificant compared to that of the estimable Bishop Otho, who solemnly asserts that he baptized one thousand five hundred and fourteen children, the miraculous offspring of his niece at one birth. It was, and perhaps is still, a doctrine of the Church of Rome, that the ovum becomes a fit subject for baptism as early as the fortieth day after conception; and hence it may be surmised that the simple prelate performed the sacred rite on a large bunch of vesicular hydatids which he mistook for aborted ova.

At Wishford Magna there is a very old monument in memory of one Thomas Bonham, lord of the manor, who died in 1473. Report says that he was the father of "seven children, born at one birth, and all brought to church in a sieve to be baptized."[3] The story goes, that Thomas Bonham and his wife Edith, finding a family coming on rather too rapidly for their means, agreed to separate for seven years; with the understanding, that if neither party was seen or heard of in that interval, either was to

[1] The Works of that Famous Chirurgion Ambrose Parey. Translated from the French by Thos Johnson. Liber xxv, p. 648. London, 1665.

[2] Diseases of Women with Child, &c., 7th Edition, p. 40. London, 1736.

[3] The Modern History of South Wiltshire. By Sir Richard Colt Hoare, Bart. Vol. ii, p. 48. London, 1825.

be at liberty to marry again. Thomas then went abroad; but at the instigation of "a witch" returned seven years afterwards, just in time to prevent his wife from contracting a new marriage. This lady, at her next labor, was delivered of seven children.

Although we cannot say with certainty what are the limits of human fertility, yet it is generally allowed in the present day that six children is the largest number which has ever been produced at one birth. I must, however, confess my inability to refer the student to any very authentic instance where this number has been borne. It is true that the following announcement is contained in a newspaper published in 1806; but it is not improbable that some ingenious contributor furnished it to fill up a column, just as marvellous stories are fabricated in our own time. The paragraph runs thus:

> At Ohlau, in Silesia, the wife of a chimney-sweeper was delivered of six children on the 10th December, 1805. They were all boys, and were all dead. The woman, who had been twice married, had altogether given birth to forty-four children. During her first marriage, which lasted twenty-two years, she bore twenty-seven boys and three girls. In her second marriage, which had lasted but three years, she had borne fourteen children; viz., three at the first labor, five at the second, and now six at the third confinement.

A second example which I have found recorded is more recent, and is possibly true. The report is to the following effect:

> On the 30th December, 1831, the wife of a peasant named Dernian Plosou, residing in the village of Dropin, in Bessarabia, was delivered of six daughters, all living. They were only a little smaller than the usual size of children at birth; with the exception of the one that was born last, which seems to have been very diminutive. The mother was not quite twenty years of age. She was of a strong constitution. All the six children lived long enough to be baptized, but died in the evening of the day of their birth. The mother suffered from a severe indisposition afterwards, but subsequently got quite well.[1]

A third and still more recent instance is that of an Irishwoman at Port Philip, who, in 1841, was delivered of six children, after a labor of sixteen hours. The infants were all females. The first was stillborn, two died directly after birth, and three were thriving six or seven weeks after the labor.[2]

But to leave the region of romance and descend to actual facts,

[1] The American Journal of the Medical Sciences, vol. xii, p. 218. Philadelphia, 1833.
[2] The Port Philip Gazette, 28th August, 1841.

it may be observed, that some five or six cases at least are recorded where women have been delivered of five children at once. Many years ago, Dr. Garthshore communicated to the Royal Society the particulars of a poor woman who rapidly recovered her health, after being delivered at the twentieth week of gestation of five children. They were all females. Two were born alive, and survived for a short time; two were putrid; and one was dead, but not decomposed. The whole proceeding was accomplished in fifty minutes. Each child presented naturally, was preceded by a separate burst of water, and was delivered by the natural pains only: there was only one extraordinarily large placenta.[1] The same author also refers to two instances published in the Gentleman's Magazine, a journal which is generally regarded as a trustworthy record of the times. In the first, a woman was delivered on the 5th October, 1736, at a milk-cellar in the Strand, of three boys and two girls at one birth. In the second example, a woman at Wells, in Somersetshire, was put to bed in March, 1739, of four sons and a daughter; all of whom, a few hours afterwards, were alive, all christened, and all seeming likely to live.[2]

Scattered through the various volumes of the periodical just alluded to are at least some half-dozen instances of four infants at a birth, and several more may be found in other journals.[3] One of the most curious of the cases in the Gentleman's Magazine is the following:

> On the 4th March, 1814, the wife of Mr. James Pickworth, grazier, of Sempringham in Lincolnshire, was delivered of two boys; after which she was so much composed that she got up the next day, and was able to go about until the 6th, when she gave birth to two more boys.

[1] Philosophical Transactions, vol. lxxvii, p. 344. London, 1787. The five fœtuses are preserved in the Museum of the Royal College of Surgeons. See The Descriptive and Illustrated Catalogue of the Physiological Series of Comparative Anatomy contained in the Museum of the Royal College of Surgeons in London, vol. v. Products of Generation, p. 177. London, 1840.

[2] The notes of a case of quintuple birth of living children will also be found in the British and Foreign Medico-Chirurgical Review, vol. vii, p. 547. London, 1851. And another is quoted from a Russian journal in the Medical Gazette, vol. ii, p. 93. London, 1828.

[3] In 1674 a pamphlet was published in London with the following title-page: "The Fruitful Wonder, or a strange relation from Kingston-upon-Thames, of a woman who, upon Thursday and Friday, the fifth and sixth days of this instant March, 1673–74, was delivered of four children at one birth, viz., three sons and one daughter, all born alive, lusty children, and perfect in every part, which lived twenty-four hours, and then died, all much about the same time; with several other examples of numerous births from credible historians, with the physical and astrological reasons for the same. By J. P., Student in Physic."

Dr. Hamilton reported the case of a woman, near Edinburgh, who was delivered of four children when she was advanced to the middle of the last month of gestation: some of the children lived two or three years. The same writer says that he attended a patient in Edinburgh, who gave birth at the seventh month to four infants, all perfect and well-developed: one was born dead, and the others died the next day. Dr. Hamilton adds that these are the only examples of quadruplets, or any larger number, he had ever heard of as born in Scotland, within his memory.

Mr. Black, a surgeon at Anstruther in Fifeshire, has published a case of quadruple birth, where the infants were all alive:

The patient was 32 years of age, and had previously been delivered of six children in the same number of labors. On the 30th January, 1845, when about nine months pregnant, she was delivered at half-past seven in the morning of two male children; and at two in the afternoon, of two female infants. Three of the placentæ formed but one mass: the fourth was distinct but connected with the others by a portion of the membranes. The first male presented the breech: it weighed 4lbs. 6oz. avoirdupois, and its length was 18 inches. The second male presented a foot: its weight was 4lbs. 5½oz, and its length nearly the same as its brother. The first female presented a foot: it weighed 4lbs. 7½oz., and its length was 18 inches. The second female presented the breech: it weighed 4lbs. 3oz., and measured 17 inches in length The patient for some weeks before labor was of an enormous size, and suffered much from dyspnœa. Her husband was phthisical. Their diet consisted chiefly of fish.[1]

The history of another case, the particulars of which have been kindly communicated to me, is as follows:

On the 22d March, 1864, a Mrs. Kennaby, æt. 24, was delivered by Dr. Simpson, of the City Road, London, of four mature female children. Three or four days afterwards the mother and infants were all doing well; but the latter then died. Dr. Simpson informs me that there were four separate placentæ, as well as a rough fibrous mass having the appearance of a false conception. The whole delivery only occupied forty-five minutes. It was the mother's second pregnancy; at her first labor she had only one child.

In the following example, the children were born prematurely; but the case, as related to the Fellows of the Obstetrical Society of London, in October, 1860, by Mr. Henry G. Times, is deserving of further record:

The patient, aged thirty-three, was pregnant for the fifth time. She was taken in labor on the morning of the 23d September, 1860. At eight P. M.,

[1] The Northern Journal of Medicine, vol. ii, p. 265. Edinburgh, 1845.

a female child was delivered by the midwife in attendance; ten minutes after, a second child; and twenty minutes afterwards, a third was born. Then followed a very large placenta; when the midwife, finding there still was left another child, sent for Mr. Times. The placenta had drawn down the abdomen of the remaining child. After a little manipulation the feet were reached, and delivery of this, the fourth child, effected. The first three were alive and crying; the last never breathed. There was little hemorrhage. The previous pregnancy terminated at eight months, in December, 1859. The last catamenial period was during the first week in March, but the discharge was so scanty that she considered herself to be then pregnant. Hence the quadruplets were probably between six and seven months old. The children were all well formed, all upwards of twelve, and one thirteen, inches in length. The first lived seven hours; the next two, three hours. The placenta was single, but each funis had a distinct attachment. There was no lobulation of the placenta. The patient recovered well.

The most recent case of quadruplets, in this country, with which I am acquainted, is the following:

On the 16th March, 1866, Mr. James Wilson, of Cullen, was called to see Mrs. M——, æt. 38, who had just been delivered by a midwife of two live full-grown male children. On examination, Mr. Wilson removed two placentæ united. He then discovered a third child presenting. It was born alive, was a female, and the placenta soon followed. Two hours afterwards a fourth child was born, a female; it showed symptoms of vitality, but the feeble powers of life could not be resuscitated. Shortly afterwards, the fourth placenta was removed. The children were all mature, about the average size of twins, well-formed, and healthy-looking. The mother speedily recovered.[1]

Haller conjectured that quadruplets happened once in about 20,000 births; but had he said once in 200,000 the remark would have been nearer the truth. In the reports of the Dublin Lying-in Hospital, only one case of quadruplets is recorded out of nearly 170,000 deliveries. Again, in England, during the year 1846, of married women who bore children, only 1 in 588,690 had quadruplets.

The most extraordinary history of a woman being several times delivered of triplets which I have met with, is that related by the Abbé Menage. He says:

"M. D. told me, the day before yesterday, that the wife of a petty shopkeeper in his neighborhood had borne twenty-one children in seven successive childbearings. These triplet children had not only been baptized, but had lived, some several days, others several months; twelve of the most robust being alive and grown up. He added, that as doubts might be entertained whether the husband or the wife contributed the most to produce this kind

[1] The Lancet, p. 558. London, 26th May, 1866.

of prodigy, the man made a further experiment by seducing the servant girl who lived with them. At the end of nine months she likewise was delivered of three male children, who, notwithstanding their mother's youth and delicate health, lived a fortnight or three weeks."[1]

A remarkable example of the delivery of triplets without any help, and of the murder of the three infants directly afterwards, occurred at Leominster in 1864. The report states:

For some six months past a young woman named Emma Smith, about 17 or 18 years of age, has been living in the service of a Mr. Wilkes, at the Leysters, near Leominster. About half-past twelve o'clock on Monday last, Mrs. Wilkes had occasion to go upstairs, when she saw the girl Smith in one of the bedrooms with a large slop-pail full of water. Mrs. Wilkes said she would carry it downstairs for the girl. To this Smith made strong objections. The suspicions of Mrs. Wilkes became aroused: she insisted upon taking the pail away with her, and eventually carried it downstairs. Mr. Wilkes was communicated with, and he examined the contents of the pail with a stick. He first brought up to the top of the water the arm of a child, then the body of a fine grown infant; he next brought up the leg and afterwards the body of a second child; and at last discovered a third. The three children were all, of course, dead. The girl Smith had delivered herself of the three children at a birth, and provided herself with the slop-pail full of water, into which she had plunged them immediately they were born. The girl had always borne a good character, and was believed to be a hard-working and industrious servant.[2]

Mr. Creswick Jackson has reported the history of one of his patients who was delivered of seven children within the space of two years and a half. The lady was about 30 years of age, was married in 1859, and did not give birth to her first infant until after more than two years. Then, in May, 1862, she was confined with twins; in July, 1863, with triplets; and on 2d November, 1864, with twins. The children were all born alive.[3]

The Dublin Lying-in Hospital was established in the year 1757, from which time until the end of November, 1854, there were delivered within its walls 169,848 women. These patients gave birth to 172,468 children. Of the women so delivered, 2599 had twins; 34 triplets; and only 1 quadruplets. As regards the sex, it may prove instructive to add, that 89,491 were males, and 82,977 females.—Again, of 18,300 women delivered at the British Lying-in Hospital in London, the proportion of twins was one in ninety-one births; while there was not a single case of triplets.—

[1] Menagiana. Tom. i, p. 332. Amsterdam, 1713
[2] The Times. London, 29th December, 1864.
[3] The Lancet, p. 589. London, 19th November, 1864.

Dr. Hamilton, of Edinburgh, said that he had seen triplets born there five or six times in less than twenty-five years; but it is not improbable that these births are more common in the north than far south of the Tweed. This opinion is confirmed by the fact, that of 1475 women delivered under the superintendence of the officers of the Edinburgh Maternity Hospital, between May, 1844, and the same month of 1846, 34 had twins and 3 brought forth triplets; whereas in England, during 1846, the proportion of married women who bore triplets was only 1 in 19,581.—During the year 1856, the births registered in Scotland amounted to 101,821. Of these, 1267, or 1 in every 84, were twin births; and 12 or only a fraction more than 1 in every 10,000, were cases of triplets.—If the student should wish for more extended tables, he will find them in the statistical accounts of Prussia, given by Hoffman. From these it appears, that between the years 1826–34 there occurred in Prussia 4,467,031 single births, 52,384 twin births, 659 triplets, and 11 quadruplets. One woman bore twins five times. In the same country, in the year 1840, there were 574,293 single births; 6381 twin births, or 1 in 90; 72 triplets, or 1 in 7976; and only 1 quadruplet.

Professor Spaeth, of Vienna, states that among 14,880 births at his clinic, twin births have been observed 185 times (1 in 80), viz., 135 times in pluriparæ, and 50 times in primiparæ. In 176 of the cases the infants were born alive, and in 62 examples at full term. In 108, the children were viable but not mature: in 6, they were not viable. In most instances the children were of unequal size: measurements taken in 65, gave only a like result in 3. In only 3 of the cases was the placenta of the first child expelled prior to the birth of the second. The placenta was carefully examined in 126 instances. In 49 there were separate organs with 2 chorions and 2 amnions; in 46, united placentæ with 2 chorions and 2 amnions; in 28, united placentæ with 1 chorion and 2 amnions; in 2, united placentæ with 1 chorion and 1 amnion; and 1 case was doubtful, as the textures were torn. As regards the children, the sexes were similar in more than double the number of instances in which they were different; for of the 185 cases, the twins were only of different sex in 56. Comparing this statement with the 126 examinations of the placenta it appears, that of the 49 instances with separate placentæ, 32 of the infants were of the same and 16 of different

sex. Among the 46 cases of united placentæ and double chorions, there were 26 of the same and 20 of different sex. The 31 cases with a single chorion all had twins of the same sex.[1]

6. Attempts have been made to learn at what age woman is most prolific. The investigation cannot be carried out very satisfactorily, as the facts illustrative of it are comparatively few. No data on which an opinion can be founded are supplied by the Registrar-General for England; while but few authorities appear to have paid any attention to the subject.

Dr. Bland, the first appointed physician-accoucheur to the Westminster General Dispensary, communicated the results of his practice to the Royal Society in 1781. From his register, carefully kept, it would seem that more women between the age of twenty-six and thirty years bear children than at any other periods. Thus, of 2102 pregnant women, 85 were from fifteen to twenty years old; 578, from twenty-one to twenty-five; 693, from twenty-six to thirty; 407, from thirty-one to thirty-five; 291, from thirty-six to forty; 36, from forty-one to forty-five; while 6 were between forty-six and forty-nine.[2] By extending the examination we shall obtain a confirmation of Dr. Bland's views.

The following table has been compiled from the reports of Dr. Collins and Dr. Granville, as well as from that of the Registrar-General of Scotland for 1855, as given by Dr. Matthews Duncan. The arrangement is such as to exhibit the ages of each of 48,929 women at or shortly before delivery. This number is made up of 16,385 women delivered in the Dublin Lying-in-Hospital, during the period of seven years, commencing November, 1826;[3] of 16,243 pregnant women who applied for admission either to the Westminster General Dispensary or to the Benevolent Lying-in Hospital, between December, 1817, and December, 1836;[4] and of 16,301 women delivered in Edinburgh and Glasgow during the year 1855.[5]

[1] Zeitschrift der Gesellschaft der Aerzte zu Wien. Pp. 225, 241. April, 1860.

[2] Philosophical Transactions of the Royal Society, abridged with notes, &c. Vol. xv, (from 1781–85), p. 120. London, 1809.

[3] A Practical Treatise on Midwifery, containing the result of 16,654 births in the Dublin Lying-in Hospital. P. 27. London, 1836.

[4] Transactions of the Obstetrical Society of London. Vol. ii. p. 177. London, 1861.

[5] Fecundity, Fertility, Sterility, and allied Topics. P. 9. Edinburgh, 1866.

A TABLE SHOWING THE AGE OF EACH OF 48,929 WOMEN AT, OR VERY SHORTLY BEFORE, DELIVERY.

At the age of	15	there were	12	women.
"	16	"	52	"
"	17	"	144	"
"	18	"	481	"
"	19	"	898	"
"	20	"	1788	"
				3375
"	21	"	1828	"
"	22	"	2778	"
"	23	"	2736	"
"	24	"	2975	"
"	25	"	3258	"
				13,575
"	26	"	3319	"
"	27	"	2836	"
"	28	"	3533	"
"	29	"	2127	"
"	30	"	5253	"
				17,068
"	31	"	1282	"
"	32	"	2140	"
"	33	"	1686	"
"	34	"	1593	"
"	35	"	1730	"
				8431
"	36	"	1512	"
"	37	"	944	"
"	38	"	1048	"
"	39	"	666	"
"	40	"	1088	"
				5258
"	41	"	290	"
"	42	"	345	"
"	43	"	200	"
"	44	"	151	"
"	45	"	107	"
				1093
"	46	"	53	"
"	47	"	21	"
"	48	"	15	"
"	49	"	13	"
"	50	"	13	"
				115
"	51	"	2	"
"	52	"	7	"
"	53	"	1	"
"	55	"	3?	"
"	57	"	1?	"

An inspection of this table shows that more women at the age of thirty bear children than at any other time. Taking each quintuple period, the increase up to the third is well-marked; as is the subsequent decrease of the numbers in the fourth and fifth and sixth similar periods. Hence we may infer, that the aptitude for childbearing gradually increases up to the age of thirty; after which year it as steadily declines until altogether lost.

For a woman to become pregnant in consequence of a single intercourse is comparatively rare. In the greater number of cases,

fecundation does not take place until the second or third month after marriage. Taking, for example, the population tables of Sweden for twenty years, they clearly show that the month of October is that in which the greatest number of marriages are celebrated, but the one in which the smallest number of conceptions occur; while the greater number of conceptions are proved to happen in the month of December.[1] Statistical tables prove, that when a mother suckles her children the ordinary interval between successive births is from twenty to twenty-four months.

According to M. Quetelet, the mean proportion of stillborn children in the chief cities of Europe, is one in every twenty-two births; the number being three times greater among illegitimate than among legitimate children.[2] Throughout the whole of France, in 1850, the stillborn to the living births were as 1 to rather above 37; whilst in Paris alone they were as 1 to about 12½. Probably in Great Britain nearly the same discrepancy exists between the numbers of those infants born dead in the rural districts as compared with those of large manufacturing towns. It is generally allowed that in the United Kingdom 1 child out of every 20 is stillborn; but in the Dublin Lying-in Hospital the proportion has been rather more than 1 in 17. Thus it has been already shown, that during nearly one hundred years, 172,468 children were born in this institution. Now of this number 10,259 were dead. Owing to the larger size of the head, males are much more frequently stillborn than females; the proportion being about 140 of the former to every 100 of the latter.

The dangers of parturition being greater to male than female children, it will at once be inferred that labors with the former are more frequently attended with difficulties and accidents than with the latter; and this inference is corroborated by statistical facts. From these two propositions a third follows, viz., that of the mothers who perish during parturition, or shortly afterwards from its effects, a much greater proportion have been in labor with male than with female children; the ratio probably being rather more than two to one.

[1] Traité de Physiologie. Par C. F. Burdach. Traduit de l'Allemand sur la deuxième édition, par A. J. L. Jourdan. Tome v, p. 74. Paris, 1839.

[2] Sur l'Homme, et le Developpement de ses Facultés, ou Essai de Physique Sociale. Tome i, p. 121. Paris, 1835.

Before leaving this topic I would briefly direct attention to the fact, that the mortality in first labors is about double that of all the subsequent deliveries classed together. This point is well shown in the following table of the deliveries which occurred in the Dublin Lying-in Hospital during Dr. Shekleton's mastership, from November, 1847, until the same month in 1854. The data from which the table has been constructed, have been derived from the report of Drs. Sinclair and Johnstone.

A TABLE OF 13,748 DELIVERIES, SHOWING THE MORTALITY IN MULTIPARÆ AND PRIMIPARÆ.

Months.	Total Deliveries.	Multiparæ	Primiparæ.	Deaths in Multiparæ.	Deaths in Primiparæ.
January, . .	1042	693	349	8	6
February, . .	1087	759	328	6	12
March, . . .	1255	857	398	7	7
April, . . .	1232	853	379	5	11
May, ...	1293	879	414	2	5
June, ...	1234	806	428	3	5
July, ...	1170	810	360	9	8
August, . . .	1143	779	364	7	6
September, . .	1072	691	381	8	1
October, . . .	1067	713	354	3	7
November, . .	1077	691	386	8	6
December, . .	1076	681	395	14	9
Total, . .	13,748	9212	4536	80	83

An examination of this table shows that while the mortality in multiparæ is only 1 in 115, in primiparæ it is about 1 in 55. The month of May is seen to be that in which the largest number of deliveries occurred, while it exhibits the smallest mortality. Contrasted with December, the latter appears in a very unfavorable light.

After the eighth labor certain conditions concur to gradually increase the dangers of each subsequent delivery. The chief risks are from flooding, placenta prævia, and puerperal fever; while from advance in age, combined with the effects of the wear and tear of a probably anxious life, the system is less able than in earlier years to bear up against pain and sickness.

7. From all time men have been curious to learn the sex of the fœtus contained in the uterus. And consequently, just as some farmers' wives pretend to be able to say whether an egg is fecun-

dated or not, and whether it will produce a male or female bird, so a Solomon can often be found to satisfy the curiosity of his brother sages with regard to the human female. Two aphorisms, attributed to Hippocrates, have especially been the cause of much criticism and useless speculation.[1] That physicians and astrologers in former days should not have deemed it a foolish waste of labor to treat of this subject, is by no means astonishing; and we can readily believe that such rules as those contained in *The Birthe of Mankinde*, and similar works, were thought by the vulgar to be the fruit of great learning.[2] But it is certainly remarkable to find, that even as late as the year 1834 an esteemed professor of midwifery, in a German university, did not consider it unscientific to discuss at some length the various theories which have been broached respecting the signs by which the sex of the child may be foretold; as well as the means which may be taken by the parents for securing the production of male or female children at pleasure. It seems almost incredible that any educated gentleman out of Bedlam could promulgate the doctrine that in order to obtain sons, the generative act is to be performed when the wind is northerly; yet this is one of M. Venette's seven chief rules on the art of procreating the sexes at will, and his writings were formerly much read in France. Almost equally ridiculous is the idea that the Graafian follicles of the right ovary discharge male ovules, while those of the left produce female; and no less so the advice which flows from this view, that in order to procure

[1] "A woman with child, if it be a male, has a good color; but if a female, she has a bad color." Aphorism 42, section 5.

"The male fœtus is usually seated in the right, and the female in the left side." Aphorism 48, section 5. The Genuine Works of Hippocrates. Sydenham Society's Edition, vol. ii, pp. 745, 746. London, 1849.

The first of these aphorisms is still acted upon by midwives in the East. Dr. Paul Eram says (Quelques Considérations Pratiques sur les Accouchements en Orient, Paris, 1860), that the first thing the midwife has to do on arriving at her patient's house, is to declare the sex of the child. This she does without hesitation. If the woman's face be highly flushed and her eyes brilliant, the child will be a boy. If, on the contrary, the expectant mother looks pale and sad, and her eyes are dim, the midwife declares that a girl will be born.

[2] "But if ye be desirous to know whether the conception be man or woman, then let a drop of her milke or twaine be milked on a smooth glasse, or a bright knife. Other els on the naile of one of her fingers, and if the milke spread abrode upon it by and by, then it is a woman child; but if the drop of milke continue to stand still upon that the which it is milked on, then is it a signe of a man child.

"Item, if it be a male, then shall the woman with child be well colored, and light in going, her belly round, bigger towards the right side than the left (for commonly the man childe lyeth in the right side, the woman in the left side), and in the time of her bearing she shall better digest and like her meate."—The Birthe of Mankinde, otherwise named the Woman's Booke, p. 193. London, 1604.

fecundation of the former the woman must lie on her right side during coitus, and on her left to impregnate the latter. For my own part I should scarcely have alluded to the matter, had I not reason to believe that erroneous views still prevail on this subject. Medical doctrines, no matter how absurd they may be, are very tenacious of life. Like some of the Rotifera, they appear dry and dead enough; when all at once an active and credulous student supplies them with moisture, and off they are started to run another career with as much vitality as ever. It is, however, to be hoped that there is no chance of all the old, ridiculous, and perhaps disgusting notions of the ancients being revived in the present day. To discard much of such nonsense, it is only necessary to remember two facts. First—that a man who has had one testicle removed by a surgical operation has afterwards been the father of both male and female children; and consequently the ancient opinion that boys were begot by the secretion of the right testicle, and girls by that of the left, can hardly be true. Secondly—that several years ago a poor woman died in the Maison d'Accouchement in Paris, who had had twelve or thirteen children of both sexes. On examining her body after death, it was found that the uterus was imperfectly formed; the left half of this organ and the left ovary and Fallopian tube being absent.[1]

In the year 1863, M. Zepulder, of Vienna, was in the habit of counting the beats of the fœtal heart to ascertain the sex. If the pulsations were 144, the birth of a male was predicted; if 150, a female. M. Zepulder stated, that of sixty cases, he was only five times in error; these mistakes arising from various circumstances independent of the soundness of his theory. Farther on it will appear that Dr. Frankenhauser had previously promulgated somewhat similar views, and it will be seen how little reliance can be placed upon them. Moreover, independently of the experiment related in the section on the sounds produced by the fœtal heart, I have examined the pulse in a considerable number of infants within one hour of birth, but have not found the difference in the sexes sufficient to allow of any rule being deduced. As might be expected, the frequency of the beats is less in the strong and large children than in the weakly and averaged size; while as most large children are of the male sex, this fact

[1] Dictionnaire de Médecine. Deuxième édition. Tome xiv, p. 369. Paris, 1836.

might seem to corroborate M. Zepulder's opinions. But taking an ordinary run of cases for some few weeks, it can be shown that the pulse is on an average the same in both sexes. Hence I advise, that if any physician, in fear of being deemed ignorant, should still desire to be thought clairvoyant, it will be wise for him to adopt the practice advocated by an ancient author, and predict the opposite to the patient's desires: "Because if it happen to be true (although by chance), what was foretold, they will then conclude me to be knowing, and to have said well; if otherwise (which may be once in twice), the woman and her husband obtaining what they desired, will not take so much notice of it, because one always receives with a good welcome what they desire, though unhoped for."

M. Thury, of Geneva, has propounded the doctrine that in animals the male sex is always produced when fecundation is accomplished upon ova of complete maturity, while females result when ova of a less advanced maturity are acted upon. Thus, by serving the cow with the bull at the commencement of the rut, females can always be produced; while by serving her at the middle and terminating periods of the rut, she will give birth to males. In proof of this it has been said to be a fact, that queen bees lay female eggs first and male eggs afterwards. The theory can also be tested in the common fowl; in which bird several eggs fecundated at the same time by a single impregnation arrive only successively, and in the order in which they are placed, at maturation. But in an experiment by M. Coste, a fowl, separated from the cock at the commencement of her laying, produced five eggs within the space of eight days, and the sexes resulting were as follows—male, male, female, male, female. This test, as far as it goes, certainly seems to offer a radical objection to the theory. I believe also that much stronger evidence could be adduced against the soundness of the doctrine, that conception in the human female, in the first half of the time between the menstrual periods, produces females: in the latter half, males.

It is not improbable, although nothing very positive is known, that a difference in the ages of the parents has some influence in regulating the proportion of the sexes of their children. The following table may be taken as indicating the proportion of

male births to females, under the conditions mentioned in the first column :[1]

Father younger than mother,	1000	males to	1156	females.
Father and mother of equal age,	1000	"	1055	"
Father older by 1 to 6 years,	1000	"	964	"
" 6 to 11 "	1000	"	789	"
" 11 to 16 "	1000	"	625	"
" 16 to 21 "	1000	"	625	"
" 21 and upwards,	1000	"	600	"

In a record of 2000 births by Hofacker, 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 353, 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 277, by fathers from nine to twelve years older than their wives, there were 113 females and 164 males.[2]

Thus it seems from these observations that the advanced age of the father possibly has a decided influence in occasioning a preponderance of male children. This view also tallies with what we know to be the case; for, as a rule, in England, the husband is rather older than the wife, and the proportion of live births is about 104.7 males to 100 females. It may perhaps also account for the circumstance, that amongst illegitimate children the number of males born to females is higher than it is amongst the legitimate, being as 106.3 to 100. The Messrs. Campbell state that in all countries, except among Europeans at the Cape of Good Hope, the male progeny predominate. At the Cape, from 1813 to 1820, there were born of European parents, 6789 females and 6604 males; while among the slave population the returns were 2826 females and 2936 males.

The proportion between the sexes in England, at the time of

[1] The Law of Population. By Michael Thomas Sadler, M.P., vol. ii, p. 343. London, 1830.

[2] Introduction to the Study and Practice of Midwifery. By William and Alexander D. Campbell. Second edition, p. 76. Edinburgh, 1843.

puberty, is rendered more equal than a consideration of the birth-rate alone would lead us to expect, owing to the fact that the deaths of boys in each year average 103 to 100 deaths of girls. After puberty the females predominate, in consequence of the large number of youths drafted into the army and navy and merchant marine for foreign service, the immense drain by emigration, and the greater mortality among males in consequence of their more hazardous occupations. In the year 1866, the population of the United Kingdom, including the islands, was estimated at 14,775,810 males, and 15,553,397 females.

8. The examination of cases of doubtful pregnancy must always be conducted with considerable deliberation and delicacy. It is of course to be regretted that very little reliance can usually be placed upon the statements of the patients themselves, especially if any motives exist for their resorting to deception. The fact is well known that women occasionally feign pregnancy, and even labor, either for the purpose of extorting money, or compelling marriage, or to gratify the expectations of a husband, or in order to be fashionable or patriotic. On the authority of Madame de Créquy it may be mentioned, that after the first French Revolution there was a great cry about patriotism, and the need of children for the Republic. Hence, those Parisian ladies who were fortunately *enceinte*, made the greatest possible display of their condition; while such as were less happily situated, invented a style of dress which should at least give them the reputation of being as they vainly desired to be.

More than 2000 years ago, Terence, in "The Woman of Andros," ridiculed the imposition attempted by Glycerium with the aid of Lesbia, the midwife, and showed how it failed. Davus thus explains the state of affairs to Simo:

> Multa concurrunt simul,
> Qui conjecturam hanc nunc facio: jam primum hæc se e Pamphilo
> Gravidam dixit esse: inventum est falsum: nunc, postquam videt
> Nuptias domi apparari, missa est ancilla illico
> Obstetricem arcessitum ad eam, et puerum ut afferret simul.[1]

Frauds like the foregoing are still practised, and often require much care for their detection, since the skill of a cunning and

[1] Andria. Actus iii, scena 2.

unscrupulous woman is considerable. But the practitioner who is properly impressed with the responsibility attached to his calling, and who considers how readily negligence on his part may be the origin of private pain and public scandal, will not fail to be scrupulous and watchful. Sometimes the impostors are caught by their own devices, as is shown in the following curious case reported by Capuron:

A young person, about 25 years of age, had been seduced under a promise of marriage. The promise not being fulfilled, she thought to hasten it by counterfeiting pregnancy. She arranged her dress, so as to make her abdomen appear to be gradually increasing in size; at the same time her friends were informed of her supposed condition. At the proper time, preparations were made to counterfeit a confinement. She obtained two or three pounds of bullock's blood, with which her bed and linen were soiled. A confidential friend procured a nurse. After remaining in bed for nine or ten days, a fortnight was devoted to a convalescence. Then, reappearing in public, the patient asserted that she had been delivered, and had placed the infant out to nurse. The lover still refused, however, to marry the woman, though he did not deny that he was the father of the supposed child. A year or two passed, and the father then claimed the infant. The woman refused to give it up; and hence proceedings were taken against her before the criminal tribunal of the Département de la Sèine. She was then obliged to confess to the fraud she had practised, and she defied any one to find a trace of her having had a labor on her person. Capuron, with two other physicians, was deputed to examine her; and she was discharged from custody upon their declaration that they could discover no trace of delivery either recent or otherwise.[1]

In a remarkable case (*Gedney* v. *Smith*, Rolls Court, November, 1864), the imposition succeeded for nearly ten years, and indeed would not have been detected then save for the confession of the fictitious mother just before her death. The chief features of the trial, abbreviated from the reports published at the time, are the following:

The plaintiff claimed to be the only child of Mr. and Mrs. Gedney, and to be entitled to property under a marriage settlement. The supposed parents were married in May, 1851: from that time to 1854 there was no issue, though it was said there had been several miscarriages. Mrs. Gedney, alleging she was pregnant in 1853, came to London into lodgings in the early part of 1854. On the 10th February, she had labor pains, and sent for a man named Goss. This person, it was said, delivered her of a female child—the plaintiff. Mr. Gedney came up to town in a day or two, dismissed Goss from further attendance, and called in Dr. Arthur Farre. This gentleman

[1] La Médecine Légale, relative a l'Art des Accouchemens. Par J. Capuron. P. 110. Paris, 1821.

testified at the trial, that he first saw Mrs. Gedney on the Tuesday, as she was said to have been delivered on the previous Friday; that he attended her from the 14th February until the 7th March; that it was an ordinary case; that he put his hand on the uterus, abdomen, &c.; and that it was impossible, in his opinion, the lady *could not have been confined at all.* The reputed father had registered the child and always treated it as his own until his wife's death.

On the part of the defendant, it was alleged that Mrs. Gedney had not been delivered of a child. Her physician, who examined the body after death, deposed to this effect; while another practitioner, who attended her for venereal disease in September, 1853, stated his belief that she was not at that time pregnant. It was further proved that Goss and his wife—the latter with a bundle under her cloak—called at the lodging-house on the day Mrs. Gedney was said to be confined, and remained with her for some hours. No nurse was procured; no noise of a child was heard; and the landlady, in the evening, was shown a baby, which had no redness of the skin about it like new-born children. There were marks of blood about the fireplace, and Goss said he had burnt the afterbirth. It was also shown that on the 4th February, as Mrs. Gedney was alleged to have been confined on the 10th, a poor woman named Fletcher was delivered at the York Road Lying-in Hospital; and that on the 7th February, a man and woman—afterwards identified as Goss and his wife—called at the hospital and induced Fletcher to give her child to them, in order that it might be adopted by a lady. In addition to other evidence, a clergyman was examined, who swore that Mrs. Gedney voluntarily communicated to him that the plaintiff was a supposititious child, which she had adopted in order to recover the affections of her husband by appearing to have become a mother. The secret had also been confided to her maid by Mrs. Gedney; and, on her death-bed, to her father. The jury returned a verdict for the defendant; thus denying the fact of the plaintiff being the child of Mr. and Mrs. Gedney.

This extraordinary investigation may serve to prove, that when a medical man is called in, for the first time, to a case of so-called recent delivery, where the surrounding circumstances are in the slightest degree suspicious, he is bound to make a careful examination of the infant and the patient. No statements should, *per se*, be taken on trust; any more than a physician ought to rely only on the word of one who consults him, as to the existence of some form of structural disease. There is neither difficulty nor impropriety in making the necessary scrutiny. Every accoucheur, for example, can tell at a glance an infant that has been born only a few hours from one, two, or three days old. So, also, an examination of the umbilicus would enable us to distinguish between a child of four days and one of ten; for, in the great majority of cases, the remains of the umbilical cord do not fall off until the fourth or fifth day after birth, while cicatrization of the navel is commonly complete by the tenth or twelfth. And

then as regards the mother, or reputed mother, as the case may be, it is useless to trust to the appearances of the breast; inasmuch as no great skill is needed to produce a fictitious areola with walnut-juice, or to give prominence to the gland by irritating it. So, again, any woman can arch her spine forwards, and thus produce a feeling of abdominal fulness very much like that caused by a tumor. But no patient is able to induce artificially that condition of the uterus and its mouth which exists naturally for a few weeks after labor. And hence, by a vaginal examination, the true nature of the case could be proved incontestably; so that if there were any attempt at imposition, the fraud would be detected before much harm had been done, or if the patient had been really delivered, she would be protected from unjust suspicions.

The physician, in the daily practice of his profession, has more frequently to deal with instances of concealed, than of simulated pregnancy. Concealment of pregnancy is not regarded as an offence by the law of England. But the concealment of delivery, or of the birth of a child which has died before or at or after its birth, is a misdemeanor, punishable by imprisonment for any period not exceeding two years (24 and 25 Vict. c. 100, sect. 60). It should be noticed that the child must be dead; concealment of the birth of a child which is living at the time of the investigation not being a crime.[1]

The dogged and indignant manner in which some women who are pregnant when they ought not to be so, will dispute the possibility of such an occurrence, is often rather startling to a young practitioner. The case of the nun—as mentioned by Fodéré—who sent for a surgeon to cure her of a violent colic, and who continued to disown being with child, until the cries of the infant silenced her, is doubtless no exaggeration. Indeed, it has been said that women have not only unfalteringly denied ever having been pregnant, directly after giving birth to a child; but have even drawn so extensively on the credulity of their friends as to

[1] By the law of Scotland, if a woman conceals her pregnancy during the whole period thereof, and if the child of which she was pregnant be found dead, or is missing, she is guilty of an offence, and is liable to prosecution. Evidence may be given as to there having been outward appearance, indicative of pregnancy; but the main proof of a woman having been pregnant, and that which is relied on for conviction, is clear and distinct evidence of the actual delivery of a child. See The Principles and Practice of Medical Jurisprudence, by Alfred Swaine Taylor, M.D. &c., p. 759. London, 1865.

assert, that the newly-born infant has been brought to them by the accoucheur in attendance. Hence, in estimating the value to be attached to the remarks of patients, it is necessary to be more skeptical even than the learned Irish bishop; who, after reading Gulliver's book of travels, hypercritically remarked that the volume contained *some* things which he could not prevail upon himself to believe. But independently of the notorious fact, that single women who have clandestinely indulged in sexual intercourse, and become impregnated, will resort to every kind of equivocation and falsehood and will make the most obstinate efforts to deceive, it not very unfrequently happens that the patient herself is really ignorant of her condition. There is, indeed, no doubt that a woman who has incurred the risk may become pregnant without being aware that she has conceived; and not only so, but—extraordinary as it may appear—it must be allowed that she may become pregnant in consequence of intercourse without knowing that such intercourse has occurred. Beyond all question, such an event is very rare. But the possibility of a woman, habituated to sexual connection, being impregnated while in deep sleep under the influence of excessive fatigue or of narcotics, or of alcoholic drinks, cannot be denied; since certain indisputable examples of its occurrence are recorded. In investigating cases of this kind, however, the shrewd observation attributed to old Valentin must not be forgotten,—*Non omnes dormiunt, qui clausos et conniventes habent oculos.* Somewhat allied to the very exceptional occurrences just referred to, are those instances in which women have been delivered during natural sleep, without any knowledge of the circumstance; illustrations of which are to be found in most works on medical jurisprudence.[1]

Much more marvellous are those cases where virgins are said to have been impregnated without their knowledge. It was formerly the law, that when in a charge of rape pregnancy was

[1] The following well-marked case may be quoted: M. Schultze was called on the 25th May, 1844, to attend the wife of an artisan who had reached the full term of her fourth pregnancy. He found her lying in a state of profound somnolency; so that it was quite impossible to arouse her, either by a violent shaking, or by applying the most powerful stimulants to the nostrils. On the third day of this unnatural sleep, the woman without awaking, was delivered of a healthy, living, well-formed child. On visiting her the following morning, M. Schultze found that she had just previously awakened spontaneously from her sleep; and as she had no recollection of being delivered, she was of course much astonished to find the child by her side.—Annales d'Hygiène Publique et de Médecine Légale. Tome 33, p. 216. Paris, 1845.

found to have ensued, the occurrence of this state should be deemed as proving that the woman had consented; it being held that fecundation could not take place without the woman sharing in the enjoyment of the man during coition. This opinion, however, was founded on error; experience and the first principles of physiology alike contradicting it. Gooch very truly remarks, that it is not necessary the woman should be sensible at the time of impregnation, and he subjoins the following narrative in proof of his assertion:

A maid at an inn, who was always thought to be virtuous, and bore a good character, began to enlarge in a way which excited suspicions of pregnancy. She solemnly declared that she had never had connection with any man. At length she was delivered, and was afterwards taken before a magistrate to swear to the father; but she repeated her former declaration. Not long afterwards, a postboy related the following circumstance: He said that one night he came to this inn, put his horses in the stable, and went into the house. He there found that all had gone to bed except this girl, who was lying asleep on the hearth-rug, and without waking her he found means to gratify his desires.

Mr. Cusack communicated to Dr. Montgomery the following particulars of a somewhat similar case, which occurred under his own observation:

A female servant at a hotel in Nenagh proving pregnant, solemnly declared that she was not conscious of having had intercourse with any man. Suspicion, however, fell upon a hostler in the establishment, who subsequently acknowledged that he believed himself to be the father of the child. He stated, that having found the woman in a deep sleep from great fatigue, he had connection with her; and, as he believed, totally without her knowledge, as she neither evinced conciousness of the act at the time, nor recollection of its occurrence afterwards. The parties were married by mutual consent.

Not many years since it was the opinion of physiologists, that the only active portion of the seminal fluid was its volatile odor, the grosser particles being merely of use as a vehicle for this *aura seminalis*. On this absurd hypothesis, the foregoing cases would have been easily explained; and it is strange that the first one has not been added to the histories of what Gardien terms those "marvellous phenomena," where women are said to have become impregnated by the mere application of the male secretion to the external parts of the vaginal labia.

But allowing that impregnation may occur, under very peculiar

circumstances, without a woman's knowledge, is it possible that she can continue ignorant of her pregnancy until the child is brought forth? Hebenstreit, writing one hundred years ago, answered this question in the affirmative; for he asserts that a female might be impregnated while intoxicated, could go to the full period without knowing she was pregnant, and might mistake her labor pains for an attack of colic or dysmenorrhœa. Here it will be observed the combination of three most improbable conditions is required, viz., impregnation without consciousness, the imitation of disease by the gradually enlarging gravid uterus, and the mistaking of labor pains for an attack of colic. Surely it must be conceded that if such an occurrence is barely within the bounds of possibility, yet to say the least very strong moral evidence would be requisite to make it credible in any particular instance.

On the other hand, putting aside the question of unconsciousness during sexual intercourse, it is quite possible for a woman to become pregnant, and to go to the full term of gestation, without knowing that she is in such a condition. She may, indeed, remain for some hours in labor, and yet be ignorant that she is about to give birth to a child. The following case, which occurred in my own practice, is a proof of the truth of these remarks:

I was sent for on Thursday morning, 17th April, 1862, at nine o'clock, to see Mrs. G., forty-two years of age, who had been suffering great pain in the abdomen since eleven o'clock on the preceding night. This lady had previously sought my advice on some half-dozen occasions. She had last consulted me at the beginning of March for an attack of indigestion, on which occasion no mention was made of any enlargement of the abdomen, nor was there any swelling perceptible through her dress. Her history is that she has been married rather more than three years (since February, 1859), and that she has never been pregnant. The catamenia were last on some time in June, 1861; but as they had been very scanty for five or six months before, this circumstance did not particularly attract her attention. In fact she attributed the cessation to the change of life.

On my arrival at the patient's house I found her in bed, complaining of great abdominal pain, which had kept her awake the whole night. Her husband and mother-in-law were present, as well as a married sister who had borne children. I was told that Mrs G. had not been well for a fortnight, her breath having been short on making any exertion, and her legs having become swollen. On Wednesday night, at eleven o'clock, she suddenly began to suffer from pain in the stomach, for the relief of which her friends applied a mustard-poultice. At two o'clock A. M. the sufferings were so great, that a neighboring medical man was sent for. This gentleman was unable to attend, but sent his assistant, who was said to have stated that the illness was due to "flatulence and inflammation of the bowels." He gave a bottle of medi-

cine, the second dose of which, however, caused sickness, and failed to afford any relief.

On examining the abdomen, I discovered an oval tumor distinctly occupying the right side, and extending from the pelvis to some two inches above the umbilicus. It seemed to be about the size of the adult head; but although the abdominal parietes were thin, the tumor was by no means distinct to the sight, though it was readily made out on palpation. On making a vaginal examination I found the os uteri dilated to the size of a crown piece, and the head of a fœtus entering the brim of the pelvis, with the vertex presenting. The membranes were ruptured; but the patient was not conscious of any discharge of water having taken place, and there was no appearance of moisture on the bed upon which she had been lying all night. On inspecting the breasts a narrow brown areola was seen; but it certainly did not exceed half an inch in width. When Mrs. G. was asked if she had felt any movement in her abdomen, she allowed that she had occasionally experienced curious sensations for some weeks past, but these were attributed to flatulence. During the whole period of pregnancy there had been neither sickness nor any feeling of nausea. The moderate increase in size which was perceptible had been attributed to the natural deposition of fat, for all the members of her family are disposed to be stout.

As the pains were not violent, and the head did not advance, I left the case at nine o'clock, after explaining its nature; but this explanation was received with incredulity, neither the patient nor her husband having the slightest suspicion that pregnancy existed. The sister, however, took steps for obtaining the loan of some baby-linen, &c.

At half-past one in the afternoon, when I returned, the pains of labor were strong and of frequent occurrence. The head was low down and the parts fully dilated. After waiting an hour the violence of the pains and their slight effect upon the fœtal head led me to fear that rupture of the uterus might take place, unless relief could be quickly afforded; and therefore I applied the short forceps, and easily effected delivery. The child, a female, was born with animation suspended; but, by a persevering use of artificial respiration, it was resuscitated at the end of half an hour. Although small it seemed to be a mature infant. She has since become strong and healthy.[1]

The medico-legal bearings of the foregoing curious case are so apparent, that they need but little comment. The history, however, seems to establish the fact that a woman may conceive, may go to the full term of gestation, and may be in labor for ten hours, without having any suspicion that she is pregnant. It ought perhaps to be mentioned that from all I have seen and heard of Mrs. G., no doubt whatever is entertained but that her statements may be taken as strictly true. Independently of this circumstance it so happens that both parents, though they despaired of ever having a child, were most anxious for one; and the birth of the little girl is, therefore, regarded as the happiest event which could befall them. The publication of this case led Dr. J. Shortt, of

[1] Transactions of the Obstetrical Society of London, vol. iv, p. 113. London, 1863.

Chingleput, Madras, to forward the details of a somewhat similar instance to the Obstetrical Society of London. The chief features are as follows:

A. B., æt. 40, European. Married in India in 1844, where she has been residing for the last eleven years. Has had two children, the last nine years before. She had been at first actively treated by the speculum and caustic for inflammation of the womb; and had likewise taken much medicine, with the idea of removing what was considered to be a dropsy of the abdomen. She was in entire ignorance of her pregnant condition. The escape of a watery fluid for two days was considered as evidence of rupture of the ovarian cyst. At the end of the two days severe pains set in, for which she was directed by a surgeon to be placed in a warm hip-bath; opiates were given. While in the hip-bath, however, delivery of a living mature child occurred, to the great surprise of the patient and her friends.

The presence or absence of the hymen proves nothing with regard to pregnancy; for it can be ruptured by other causes than sexual intercourse, while it may continue perfect in spite of connection, and may even remain intact until labor has set in. Still it must be allowed, that although the presence of this crescentic reduplication of the vaginal mucous membrane is not a reliable sign of chastity, yet the presence of a delicate and complete hymen renders it very probable that the woman in whom it exists is a virgin. When this membrane is found uninjured in a pregnant woman, it will generally, but certainly not always happen, that impregnation has been the result of one coitus; and hence it is much more frequently met with in girls who are the victims of the seducer than in married women.[1]

Women sometimes imagine themselves to be with child when they are not so; such a mistake being most commonly made about the time of "the change of life." Although this subject

[1] The reader should refer to a few notes of cases where the vagina has been found at the time of labor, almost completely closed by the hymen, or by an adventitious membrane, extending between the labia, in A Synopsis of various kinds of Difficult Parturition, by Samuel Merriman, M.D., third edition, p. 216 to 222. London, 1820. Some remarkable examples of the same kind are also related by Mauriceau, Gardien, Baudelocque, Meigs, and many other authors; and further on, one will be found quoted which happened in the practice of Professor Rossi. In the Medical Times and Gazette (p. 606, 28th May, 1864), there is a remarkable instance, in which pregnancy was detected by Scanzoni, although the orifice of the vagina was closed by a firm and tense membrane, in which an aperture only big enough to admit a probe was discovered with much difficulty. The same journal cites a case by Dr. Mattei, where instead of the vagina there was only a cul-de-sac, in which no opening through which semen could have passed was to be detected. After severe labor for three days, the tissues in front of the head gave way, and delivery was accomplished with the forceps.

will be found more fully treated of in the third chapter of this treatise, yet a few remarks in the present section will hardly be deemed out of place. It may be shortly said, then, that in such instances the error is fostered chiefly by the following circumstances: The catamenia become irregular, or they entirely cease; the breasts enlarge; there is often nausea and vomiting; the abdomen grows full and prominent from the deposition of fat in the integuments and throughout the omentum, as well as from flatulent distension of the intestines; the appearance of a tumor is produced by some abnormal action of the diaphragm and abdominal muscles; while the movements of a fœtus are simulated by the rapid passage of flatus from one portion of the intestine to another. Occasionally the self-deception is carried so far, that at the end of the supposed gestation, spurious pains imitative of labor set in. Under such circumstances, the patient is often apt to be both incredulous and indignant when told that she is not pregnant. I remember a case which occurred in my own practice, a few years since, and which may be mentioned as corroborative of these remarks:

Having been previously engaged to attend a lady forty-two years of age in her second labor, I received a message one evening that my assistance was required immediately, as the pains had commenced. On visiting the patient, I found the nurse busily engaged in airing the infant's clothes, and in assuming all the bustling importance of a person in authority; while the expectant mother was walking about the room, and complaining of her sufferings. On making a vaginal examination, however, I found to my great surprise that the uterus was only of the normal size in its unimpregnated state, with a long cervix, and the mouth and lips small and healthy. Pursuing the investigation still further, it became clear that she was not even pregnant; but had been deceived by the natural, though early cessation of the catamenia, by an excessive increase in the adipose tissue of the abdominal walls, and by an abundant secretion of flatus in the intestines. I was, of course, prepared to find my explanations of her condition laughed at as impossible; for it is not to be expected that when a woman has been dwelling exclusively upon one idea for many weeks, she will cast it aside just at the moment she believes her anticipations are about to be realized. It is due, however, to my patient to add, that she did not maintain her delusion very long; since she listened to a simple statement of the facts, and was apparently convinced of her mistake by the end of twenty-four hours.

Ladies are not by any means always as sensible as the one whose history has just been given. Dr. Montgomery states that he has known them remain perfectly persuaded of their pregnancy for one, two, and three years; while, in one instance,

both the lady and her physician assured this gentleman that the movements of the child had been distinctly felt for nine years.[1]

9. The function of reproduction, as it is effected in the various classes of animals, is one of the most interesting subjects to which the attention of the physiological student can be directed. A superficial examination of the matter shows that there are three modes in which this function is performed: (1) *Fissiparous multiplication*, a non-sexual mode of reproduction, in which propagation is effected by the division of the parent body into two symmetrical portions, or into four or six or eight or more irregularly shaped masses, each of which becomes an independent individual; this process being common amongst the Infusoria, and in some of the Cestoidea and Annelida. (2) *Multiplication by gemmation*, also a non-sexual form of reproduction, in which the offspring arise by buds, like the parts of a tree, as is seen in Vorticellæ and Polyps. In this variety of reproduction, the buds or sprouts either gradually assume the structure and appearance of the perfect animal while attached to the parent stem, afterwards being separated to enjoy an independent existence; or the young are produced from small germs or buds detached from the parent body, the evolution of the new animal not beginning until after such separation, in a manner analogous to the production of the fœtus from the egg in higher animals.[2] And (3) *True generation*, or sexual reproduction, consisting in the union of the contents of two different cells, called respectively the "sperm cell" and the "germ cell." The sperm cell is secreted by the male organs, and the germ cell by the female; and these male and female organs may exist in one individual or in separate individuals. The first condition is known as *unisexual*, and the second as *bisexual* generation. In some unisexual, or hermaphrodite animals, self-impregnation takes place, as is the case in the tænia solium; while in other instances concourse is necessary, in order that the ovules should be exposed to the action of the spermatic fluid, as happens with many of the mollusca like the common snail. In these last instances each hermaphrodite animal impregnates its neighbor; that is to say,

[1] An Exposition of the Signs and Symptoms of Pregnancy, &c. By W. F. Montgomery, M.D. Second Edition, p. 394 London, 1856.

[2] Animals which propagate by self-splitting or self-dividing, or by budding from without or within, are often spoken of as parthenogenetic individuals. The term is derived from παρθενος, a virgin, and γιγνομαι, to be born.

the male organ of each fecundates the female of the other. Again, where the situation of the sexual organs on separate individuals leads to the necessity for copulation, the offspring may be born alive, or they may be hatched from eggs produced by the female. To the *viviparous* animals, the mammalia belong: to the *oviparous*, the birds, with most reptiles and osseous fishes. The distinction, however, between these two classes is more apparent than real. For in both, fecundation of the ovum—or ovule, as it is better to term it, so as to distinguish it from the fecundated ovum—generally occurs within the body of the female parent; the egg, so to speak, being hatched after its expulsion from the oviduct. But in the one case, this hatching or incubation takes place within the female body, in a special organ known as the uterus; while in the other, it occurs out of the body under the influence of warmth and air. The exceptional cases, in which the ovules are not fecundated within the female parent's body, consist of those osseous fishes and batrachian reptiles, in which there is no strict union between the sexes; the ovules or spawn deposited by the female having the seminal fluid or milt diffused over them by the male. Intermediate, as it were, between the viviparous and oviparous, are the *ovo-viviparous* animals; of which the cartilaginous fishes, with certain snakes and lizards, are examples. In these, the ovule is fecundated before it leaves the ovary or just afterwards: in the oviduct, the ovum inclosed in a vitelline membrane, receives a covering of soft albumen, on which is condensed a thin and tough membrane free from calcareous matter. The eggs are retained within the oviduct until the young are able to leave them; so that the offspring are born alive.

Among the placental mammalia the generative organs resemble those of the human subject. In the male, we have the bundles of seminiferous tubules inclosed in a fibrous capsule, and constituting the testicle, together with the efferent duct; to which is added the penis and certain accessory glandulary structures. On the part of the female, there is the ovary with its Graafian follicles or ovisacs, in which the ovules are developed and prepared for fecundation; together with the parovarium or remains of the Wolffian body, the Fallopian tube or oviduct, the uterus, and the vagina. Each ovule is invested with a homogeneous tissue, called the zona pellucida, or vitelline or yolk-

membrane, within which is the yolk, with its germinal vesicle containing the germinal spot. The ovule is about the $\frac{1}{120}$th, and the germinal spot about the $\frac{1}{1000}$th of an inch in diameter. The spermatic filament, or spermatozoon, or sperm cell of man is about $\frac{1}{800}$th of an inch long and about $\frac{1}{3000}$th of an inch wide at the head. It is now regarded in the light of an epithelial cell—or rather as its nucleus—modified in structure, and endowed with peculiar properties. The originally received notion of its animal nature is placed without the bounds of speculation. The movements of the spermatozoa continue longer in the interior of the female organs of generation than in any other situation. The researches of Mr. Newport on the ova of the frog, prove that impregnation does not take place unless the spermatozoon actually passes through the vitelline membrane, and comes into immediate contact with the yolk-substance.

The exact nature of the influence communicated by the spermatozoa to the ovule is an enigma which has not yet been solved. Philosophers, however, are chary of confessing their fallibility; and hence many and strange are the opinions which have been put forward as a cloak for ignorance. Yet the errors which seem unavoidably to belong to the early stage of almost all scientific investigation may—if rightly studied—serve for something more than mere amusement. Just as the search by the alchymists for means whereby they might transmute the baser metals into gold has been productive of some most important and varied chemical facts, so inquiries into the inexplicable ultimate cause of all vital functions has at least increased our knowledge of the various processes of the phenomena of life. Drelincourt, in his *Opuscula Medica*, published in 1727, prefaced his theory of generation by showing that two hundred and sixty-two groundless hypotheses had already been proposed; and as Blumenbach naïvely remarks, "Nothing is more certain than that Drelincourt's own theory formed the two hundred and sixty-third." Some of these conceits are perhaps sufficiently extraordinary to demand a passing notice. Thus, Pythagoras thought that a vapor descended during coition from the brain and nerves of the male, from which these parts were formed in the embryo; the grosser tissues being composed of the blood and humors contained in the uterus. He considered also that the fœtus was formed in forty days; but that seven, nine, or ten months were required for its perfection. Empedocles

imagined that some portions of the embryo were contained in the semen of the male, and others in that of the female; the child being formed by the union of the two. The opinion of Hippocrates also was, that conception took place in the uterus by the mixture of due proportions of the male and female semen, in which the organic principles of the embryo were equally contained; the sex of the offspring depending upon whether the male secretion was more powerful than the female's, or *vice versâ*. Aristotle taught that the material parts of the embryo were formed by the catamenial blood, and that the male semen imparted the principle of life when the body was formed. Making a long stride over many centuries, we find Descartes and his followers believing that when the male and female seminal fluids were mingled, a fermentation took place and a fœtus was formed. The experimenters in chemistry would have it, that the male secretion being acid, and that of the female alkaline, a double decomposition took place on their mingling, so that a fœtus was precipitated. Then, lastly, we have Ludwig Hamm in 1667, and a few months subsequently Leeuwenhoek, asserting that an immense number of animalculæ exist in the semen of all male animals, and that they contain the perfect rudiments of a future animal, each of its own kind; and that these animalculæ merely require from the female a proper nidus or habitation, and suitable nourishment. The discovery of the movements of the minute seminal particles seemed to confirm this theory; while some writers even held that these supposed animalcules were of different sexes, and that they copulated so as to engender male and female offspring.

Leaving these fancies of a bygone age, I would add a few words upon the immediate signs by which many obstetricians of the present day consider it may be inferred that a woman has conceived. Although undeserving of much attention, the phenomena which have been relied upon for centuries are as follows: A sense of greater voluptuousness, a more general erethism is experienced during the fruitful coition by both parties, but especially by the female; a slight rigor or spasm or feeling of contraction is excited, followed by an indescribable pleasure, which is again succeeded by a sense of languor and depression; while the seminal fluid is retained, instead of passing away by the vaginal orifice. Sometimes a sensation like colic is felt in the umbilical region, with pain in the pelvic and lumbar regions; and a feeling as of

congestion and slight weight in the uterus occurs, with a tendency to nausea. In a day or two there may be neuralgic tenderness of the cutaneous surface of the abdomen, with a variable amount of tumefaction; as well as a general excitement of the vascular system, with a disposition to feverishness. The eyes become more sunken and languishing, their brightness diminishes, and a bluish circle appears round the orbits; and there is often a peculiar softness and trifling lividity of the features. One author, M. Mangars, has said that it is a sign of conception when the seminal odor is appreciable to the taste; but some foreign writers seem to take a pleasure in suggesting anything that is grossly extravagant.

10. When a woman has become pregnant she should be treated with watchful solicitude and tenderness by those immediately around her, and more particularly so the nearer the time of her suffering draws nigh. In all ages the state of utero-gestation has secured certain privileges to the female. Paris and Fonblanque remind us that the Athenians spared the murderer who took refuge in her dwelling. The ancient kings of Persia presented pieces of gold to every woman in this condition. In Egypt, the woman condemned to die was never executed till after her delivery; while even the Jews relaxed the rigid commandments of the Mosaic law and allowed prohibited viands to the pregnant female, whose fastidious appetite might make them articles of desire. The fact is undeniable that pregnancy increases the general susceptibility and alters the disposition. It may give rise to a weak self-indulgence in wayward and capricious fancies; whilst the most amiable are often rendered by it extremely irritable, particularly under any attempt at control or contradiction. In many, also, the anticipation of the pains and dangers of labor is the cause of much mental uneasiness, or even of great despondency; the depression rather increasing than diminishing with each gestation. The respectful deference which is commonly shown to women in civilized countries at all times, is now therefore more especially demanded; while a little forbearance and gentleness and persuasion will do much more than rudeness or harshness in making the future mother conceal any infirmity of temper, as well as in enabling her to assume a calm and cheerful deportment.

These remarks will possibly be deemed unnecessary by some of my readers, but it is often far from unprofitable to repeat home truths. No doubt pregnancy and parturition are perfectly natural conditions; and certainly very many individuals can be found who are able to go through both with almost as much ease as the women of rude and savage nations are supposed to have formerly done. We know that many barbarous customs were prevalent in days long gone by, but we cannot learn to what extent the victims of these habits died. Thus Bruce, in describing the inhabitants of Galla, in Abyssinia, curtly observes: "The women are said to be very fruitful. They do not confine themselves even a day after labor, but wash and return to their work immediately. They plough, sow, and reap."[1] Even in the present day, according to Dr. John Batty Tuke, the process of parturition among the Maori women is not the dreaded ordeal which it is amongst more civilized nations. When the native feels that her time has come, she retires alone to a creek or brook, preferring one that flows through the bush. There she gives birth to her child, performing the necessary duties herself. On the completion of labor, she steps into the water, washes herself and infant and clothes; and then proceeding to her *whare* or hut, reappears with the babe in the family circle, as if only a matter of slight moment had occurred. Her female friends never interfere unless assistance is solicited. "I have seen," says Dr. Tuke, "a woman quietly leave the house, and reappear within the hour with her baby in her arms, and surrounded by her congratulating relatives." The umbilical cord is never tied, merely twisted. The result is, that umbilical hernia is very common. But Dr. Tuke adds that mal-presentations are by no means unknown, and when nature cannot relieve the patient, death necessarily results. The usual treatment under such circumstances consists in scarifying the abdomen, and the employment of charms and incantations. "This practice is, like some in more civilized nations, more warranted by antiquity than success."[2] Still more extraordinary stories are told by ancient travellers. Diodorus, the Sicilian—the contemporary of Cæsar and Augustus, and who travelled over a great part of Europe and Asia before writing his Universal His-

[1] Travels to Discover the Source of the Nile. By James Bruce. Vol. iv, p. 468. Edinburgh, 1790.

[2] Medical Notes on New Zealand. Edinburgh Medical Journal, vol. ix, p. 724. February, 1864.

tory—speaking of the Corsicans, tells us: "A very strange thing there is among them concerning the birth of their children. When the woman is in labor, no care is taken of her in the time of her travail; but the husband goes to bed, as if he were sick, and there continues for certain days, as if he were suffering the pains of a woman in travail."[1] So also Strabo relates of the Iberian women, that "they till the ground, and after parturition, having put their husbands instead of themselves to bed, they wait upon them."[2] And if we are to believe the statement of a former Bishop of Norwich, these manners were not quite extinct at the end of the last century; for Dr. Horne remarked that—"In Kardan, a province of Tartary, as soon as a woman is delivered, she rises, washes, and dresses the child. Then the husband, getting into bed with the infant, keeps it there forty days, and receives visits *as if he* had lain in."[3] I have also heard that this practice is still adopted among the Basques of Spain; and that a like custom prevails with some of the Indians of South America.

Now although it may be well supposed that no change of fashion can ever introduce these manners into any part of civilized Europe, yet it is not as certain that we shall not draw false conclusions from reasoning upon them. As I before remarked, we have no means of learning what proportion of women formerly died in childbirth. But we happily can tell, that as our knowledge of physiology and pathology has increased in modern times, so the mortality of parturition has certainly, in this country at least, lessened. Not to weary the reader with long proofs of this, it will suffice to mention that the annual deaths in childbirth, in London, in the years 1660–79, were 86 for every 100,000 inhabitants; whereas in 1859 the numbers were only 17 for the same proportion.[4] Moreover, it has been shown again and again, by Dr. William Farr, in letters to the Registrar-General, that the mortality during childbirth in England and Wales is steadily diminishing. For instance, in the year 1847, the birth of every

[1] Diodori Siculi, Bibliothecæ Historicæ. Liber v, cap. 5, p. 139. Basileæ, 1578.

[2] The Geography of Strabo. Book iii, chap. 4. Bohn's Edition, vol. i, p. 247. London, 1854.

[3] Memoirs of the Life, Studies, and Writings of Dr. George Horne, late Lord Bishop of Norwich, &c, p. 405. London, 1795.

[4] The Twenty-second Annual Report of the Registrar-General of Births, Deaths, and Marriages in England, p. 36. London, 1861. The reader may likewise be particularly referred to a table showing the average number of deaths in childbed in London from the year 1660 to 1819, contained in Dr. Merriman's Synopsis of the Various Kinds of Difficult Parturition, &c. Third edition, p. 323. London, 1820.

10,000 living children was the death of 60 mothers; in 1848, of 61; in 1849, of 58; and so gradually downwards, until in 1857 only 42 mothers died to every 10,000 live births. Unfortunately the decline has not been progressive. The number of deaths to the same proportion of births, runs thus: 48 in the year 1858; 51 in 1859; 46 in 1860; 43 in 1861; 43 in 1862; 49 in 1863; and 54 in 1864, during which year 740,275 children were born alive. That the mortality in childbirth is still so large, should not be allowed to escape the notice of the practitioner of obstetric medicine. The number of deaths registered in England during 1864, as due to childbirth, was 2532; this number not including 1484 fatal cases of puerperal fever (metria), nor 460 deaths after childbearing from diseases not incidental to parturition, though possibly aggravated by it. How to lessen such a mortality as this for the future, ought to be a subject of serious reflection with us all. For my own part, I cannot but believe that some advance may be made in this direction by discouraging the marriages of young women before their growth is complete, and before their organs are fully developed; as well as by paying greater attention to the general health during the whole period of pregnancy. Seeing that several zymotic diseases have a somewhat more fatal tendency when they occur during gestation, the greatest care is necessary by sanitary arrangements and measures against contagion to guard the pregnant women from the influence of epidemic disorders. And then, instead of attempting to harden the system, instead of allowing the pregnant woman to toil and endure anxieties and hardships beyond her strength, we should try to soften her lot as much as possible, and to avert as far as may be the law—"in sorrow thou shalt bring forth children." It has sometimes been erroneously thought that because the parturient process in domesticated animals is easy or difficult in proportion as they are subjected to a life of toil, so a similar law must apply to the human subject. But the experience of every obstetrician who has practised both in St. Giles's and in St. James's will rebut this opinion. The cow in the country farm, living unfettered in the meadow until the day of calving, has in general a safe and easy labor. The poor beast, on the contrary, which is kept in a town dairy has a time so incredibly dangerous, that the proprietor generally sells off his stock every year, and replaces it with cows in calf; such cows not being put into the stalls

till within six or eight days of the expected period of parturition. The correct deduction from this is, that an artificial mode of life—a life maintained by improper food, and without a sufficient supply of pure air, or a due amount of exercise—has a most deleterious influence upon the process of labor; and not that a toilsome existence, embittered with all the pains and anxieties of poverty, gives comparative immunity from danger in the hour of parturition.

The only other step that can be recommended, in addition to the measures already advised, to render the time of pregnancy and labor in women less dangerous than it is now, is to lay the foundation of a sound and vigorous constitution in early life. If the present race of mothers can but be taught to rear and educate their girls in accordance with the simple teachings of physiological science and sound common sense, the future mortality in childbirth will be materially lessened. Instead of being so anxious to provide their children with wealth, and to make them worldly-wise or fashionable or even learned at any cost, let the parents consider how much more important it is to devote some time and attention to securing for each of them a sound and robust constitution. Let them take care to note in time, the truth of those wise words of the son Sirach, that—"Health and good estate of body are above all gold, and a strong body above infinite wealth."

CHAPTER II.

THE SIGNS AND SYMPTOMS OF PREGNANCY.

Section 1. The classifications which are usually adopted—A table of the symptoms and signs of pregnancy.
Section 2. Suppression of the catamenia—Puberty and menstruation.
Section 3. Nausea and vomiting—diarrhœa and salivation.
Section 4. Mammary sympathies—The areola, secretion of milk, etc.
Section 5. Enlargement of the abdomen—Position of the uterus at different periods of pregnancy.
Section 6. Movements of the fœtus—Quickening and its causes.
Section 7. Changes in the uterus—Dimensions of this organ at the various months.
Section 8. Ballottement or repercussion.
Section 9. Signs derived from auscultation—The fœtal movements—The funic pulsations and funic souffle—The uterine souffle—The fœtal heart.
Section 10. Minor signs—Kiestein—Contractile power of the gravid uterus—Discoloration of vagina—Examination of the blood—Vaginal temperature—The vaginal mucus—Shape of the os uteri—Vaginal pulse—Occipital headache—Certain physical and moral changes.

Section 1.—Classification of the Signs of Pregnancy.

The division of the signs of pregnancy into classes appears to have been a favorite custom with most authors. In France, the almost universal subdivisions which are adopted seem to be into the rational and the sensible signs. The first class includes those characters usually pointed out as existing in the earliest periods, —such as the suppression of the menses, the enlargement of the abdomen, the darkening of the areola, the functional disturbances in the digestive organs, the modifications in the urine, and the changes in the general habits as well as in the moral and intellectual faculties; while in the second category we find those signs which are derived from the practice of the touch, or of auscultation. In Germany, some of the most esteemed writers speak first of those signs which are to be detected only by a physical examination; and secondly, of such as result from the derangements of particular functions. The authorities of Great Britain are wanting in unanimity as to a system of classification, and

each teacher strives to put forward a different scheme. Thus, Dr. Evory Kennedy speaks of—(1) those signs ascertained through the representations of the individual supposed to be pregnant,—such as the pelvic and lumbar pains, morning sickness, menstrual suppression, mammary pains, vitiated tastes, &c.: (2) the evidences which are tangible to the practitioner,—particularly the state of the hymen, the changes in the os uteri, ballottement, and the condition of the abdomen: (3) the visible evidences,—as the appearance of the areola, the emergence of the umbilicus, the discolorations of the skin, the swelling of the limbs, and the varicose state of the veins: and (4) the audible evidences,—or those which are detected by mediate or immediate auscultation. Dr. Montgomery classes the signs into three groups,—the presumptive, the probable, and the unequivocal. Many of the sympathies included in the first class may arise from uterine irritation equally with pregnancy, since they consist chiefly of constitutional affections; in the second class are included the symptoms which are due to the altered condition of the uterus itself, which, increasing in size, ceases to be a pelvic organ, and rises into the abdomen; while, under the head of unequivocal symptoms, are placed those which are produced by the movements of the fœtus, as well as the signs derived from the practice of auscultation. Dr. Rigby considers—(1) the *general* effects which pregnancy produces upon the system; and (2) the changes and phenomena that are *peculiar* to this state, and which may therefore be taken as so many means of diagnosis. Dr. Blundell treats of those phenomena which are of ordinary occurrence; those which are rare or anomalous; and those which are common to all women, but which can be ascertained solely by means of a careful manual examination. Dr. Churchill groups together the early evidences of pregnancy, and afterwards the indications of more advanced gestation.

Not to push this uninteresting inquiry further, I shall content myself by remarking, that no classification can be proposed with which some fault may not readily be found; and that even if a perfect subdivision could be laid down, it seems to me that it would be useless. In the daily practice of the obstetrical portion of his profession, the physician must have his knowledge so arranged in his mind—so, in every sense of the phrase, at his fingers' ends—that he can immediately apply it to the particular

case before him; and this will be best accomplished by each one making himself fully acquainted with the subject in all its bearings, and then, if he should find it necessary, forming such divisions and subdivisions as the bent of his own judgment will readily suggest.

A very remarkable and progressive increase in the vital actions of the generative system is manifested almost immediately after a woman has conceived. As might be expected, this is shown chiefly in the uterus. But it is also exhibited, though to a lesser extent, in the striking metamorphosis of the Graafian follicle, or ovisac, which has discharged the ovule, into a true corpus luteum; as well as in the congestion and tenderness of the mammæ which ensue. The uterus not only acquires a principle of growth, but its walls are rendered very vascular; the tissue of this organ gets infiltrated with serum, while the mucous membrane becomes greatly thickened; and the cervix and labia consequently present a peculiar velvety feel, not unlike that presented by an abraded os. In time, as the womb gradually expands and slowly rises out of the pelvic cavity, it disturbs the relations of the abdominal viscera. The bladder—being supplied, like the uterus, with nerves from the hypogastric and sacral plexuses—first suffers. This organ becomes irritable, so that a frequent troublesome desire to micturate is manifested; while in the latter stages of gestation, when the pressure and weight of the womb are considerable, great inconvenience is ordinarily experienced from an inability to retain the urine, which comes away involuntarily on coughing or laughing or even walking. Moreover, as soon as the uterus has acquired considerable size, it necessarily begins to interfere with the circulation, and particularly with that through the veins; producing more or less anasarca of the feet and legs by its pressure on those venous trunks which return the blood from the lower extremities. In the same way, the foundation is laid for intractable varicose veins and troublesome piles; though in the production of the latter the pregnancy may have a smaller share than that congestion of the hemorrhoidal veins which results from constipation. So, also, from the pressure on the pelvic nerves, numbness and cramps are experienced in the thighs and legs; and occasionally even, a temporary form of paralysis results from this cause. By the time the uterus has

acquired its full growth, it looks as if it occupied almost the whole of the distended abdominal cavity; while by pressing the liver and stomach against the diaphragm it diminishes the capacity of the chest, impedes the action of the lungs and heart, and occasionally produces a considerable amount of dyspnœa. Sometimes the uterus, as it expands and stretches the abdominal parietes, causes a separation between the recti muscles,—perhaps to the extent of two or even three inches; this abnormal chink contracting after delivery, though the sides never come into as close apposition as they were originally. The umbilical ring also is likely to become dilated, leaving a predisposition to hernia at this part. And not uncommonly, pain is complained of on either side, just below the false ribs; this pain, which at times is very acute, being consequent on the dragging of the abdominal muscles at their insertions.

In addition to these mechanical effects, the new action in the uterus induces certain changes which are to be regarded as symptoms of pregnancy. Prominent amongst these are suppression of the menses, nausea and sickness and other disturbances of the digestive organs, increased irritability of the nervous system, peculiar alterations in the tastes and disposition, and various neuralgic pains. Equally remarkable are the appearances presented by the mammary areolæ, the enlargement and extra firmness of the breasts, and the secretion of a small quantity of milk; the alterations in the countenance, resulting either from an increase in the adipose tissue or from absorption of the fat; and the change in the hue of different parts of the skin, as well as in the deepening of the color of the vaginal mucous membrane. Generally, on making a vaginal examination, strong pulsations can be felt in the arteries of the lower part of the uterus. Any of the foregoing conditions may, however, be present independently of pregnancy; though it is certain that if they all coexist, they are very much more likely to be the result of utero-gestation than of any combination of local and constitutional disease. At the same time it must be granted, that the only certain signs of pregnancy are,—the detection of the active movements of the child, positively feeling the presence of the fœtus in utero by ballottement, and the discovery of the pulsations of the fœtal heart by auscultation.

Before proceeding to the consideration of the symptoms and

signs of pregnancy *seriatim*, it will probably facilitate their study to glance at the chief of them as they are arranged in the following tabular form:

A Table of the Symptoms and Signs of Pregnancy.

Term of Pregnancy.	Morning Sickness.	Suppression of the Menses.	Mammary Areola.	Enlargement of Abdomen.	Fœtal Movements.	Shortening of Cervix.	Ballottement.	Uterine Souffle.	Fœtal Heart.	Dusky hue of Vagina.
End of First Month, . .	+	+	...	...	...	...	...	...	...	...
" Second " . .	+	+	?	...	...	...	...	...	...	...
" Third " . .	+	+	+	?	...	...	...	?	...	?
" Fourth " . .	?	+	+	+	?	...	+	+	?	+
" Fifth " . .	...	+	+	+	+	...	+	+	+	+
" Sixth " . .	...	+	+	+	+	...	+	+	+	+
" Seventh " . .	...	+	+	+	+	...	+	+	+	+
" Eighth " . .	...	+	+	+	+	...	?	+	+	+
" Ninth " . .	...	+	+	+	+	+	?	+	+	+

This table reads thus: At the end of the third calendar month the symptoms and signs of pregnancy are, morning sickness, suppression of the menses, the development of the mammary areola, perhaps enlargement of the abdomen, possibly the uterine souffle, and may-be a dusky hue of the vagina. Again the table shows that, at the end of the eighth month, we may expect to find suppression of the menses, increased development of the areola, enlargement of the abdomen, fœtal movements, perhaps ballottement, the uterine souffle, the fœtal heart, and a dusky hue of the vagina.

Section 2.—Suppression of the Menses.

The exact value to be attached, as a symptom of pregnancy, to the circumstance that the menses have become suppressed, can scarcely be explained without some brief preliminary remarks. Hence, a few observations on the accession of puberty in the male and female will hardly be deemed out of place. It is necessary to premise, however, that the time of puberty is not to be confounded with the epoch of the perfect development of the organization, when the stature has ceased to increase and ossification is completed. This epoch in man is probably not attained until the twenty-fifth year. In woman, the age of nubility—when by the development of her frame and intelligence she is

fitted to bear healthy and vigorous children, and is competent to discharge all the duties of a mother—is reached at a period varying from the nineteenth to the twenty-second year.

In the *male*, puberty occurs about the sixteenth year, and is marked by an increase in the tone of voice, by augmented development and symmetry of the limbs, by the growth of hair on the face and pubes, by a greater development of the genital organs, and by the formation of perfectly formed spermatozoa in the testes.

In the human *female*, the accession of puberty at about the fifteenth year is characterized by an exaltation of the mental powers, by an increased development of the body generally, by enlargement of the breasts, by the growth of hair upon the mons veneris, and especially by the appearance of the menses or catamenia—*Κατὰ*, according to; *μὴν*, a month. The power of procreation continues for about thirty or thirty-five years; viz., from the time of puberty until the decline of menstruation—"the change of life,"—at about forty-five to forty-eight or fifty years of age. In the intermediate years between puberty and the change of life women suffer from a sanguineous flow—the catamenia, menses, or courses—every lunar month, except during the periods of lactation and pregnancy; the menstrual discharge appearing every twenty-eight days, counting from the beginning of one period to the commencement of the next. As each period lasts, on an average, four days, the interval is of course about twenty-four days. This it must be observed is the rule, but it is a rule which has numerous exceptions. Many healthy women have an interval of thirty or thirty-one days between each period; while others, on the contrary, are unwell every three weeks. I have sometimes seen such women subjected to very unnecessary medical treatment; the practitioner forgetting that his patient was "regular" so long as her periods recurred at the times to which she was habituated. In tropical climates the menses appear about two years earlier than in this country; and about one year later in cold northerly latitudes. Puberty, also, in both sexes, is hastened by luxurious and indolent habits, by high living, and perhaps by residence in large towns. It is probable that in at least two cases out of every three, primary menstruation is unattended with any pain. And it is certain, that as a rule, strong and healthy women menstruate more sparingly than

anæmic or strumous girls; many females with a tendency to tuberculosis having a copious watery—perhaps almost colorless—catamenial flow for eight or ten days.

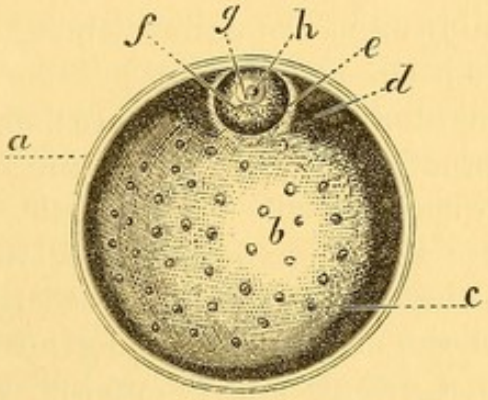
The menstrual fluid consists of pure blood, which becomes mixed with mucous and epithelial cells in its flow through the cervix uteri and vagina. It is of alkaline reaction in the uterus; and if, owing to contraction of the os, it be retained in the uterine cavity, it coagulates, and is expelled in the form of small clots. When it becomes mingled with the secretions of the vagina, however, it is rendered acid; and it is this acidity which prevents the menstrual blood from coagulating, and not, as was erroneously supposed, an absence or diminution of fibrine. The quantity of the menstrual discharge at each period varies; but it may be stated that from four to six ounces is the average.[1] The source of the flow is chiefly the mucous membrane of the body of the uterus; and perhaps, in a less degree, the lining membrane of the Fallopian tubes. It is still a disputed point whether the discharge is a secretion from the mucous membrane of the uterus and tubes, or simply a mechanical filtration of blood owing to great congestion. The latter view is the one which commends itself to my judgment; but some authorities are of an opposite opinion. On a more important question, however, there is less uncertainty; for it may now be said to be a recognized fact in physiology, that during menstruation—as during the rut or heat of animals—Graafian vesicles are ruptured and ovules discharged.[2] At the same time it must not be overlooked, that a discharge of blood from the uterus is not neces-

[1] A great variety of opinion has existed upon this point. Hippocrates thought that the Greek women lost twenty ounces at each period. Galen supposed it to be eighteen ounces in the Romans. Haller says it varies from eight to twelve ounces for German women. Du Hahn found, as the result of many careful experiments, that some women evacuated three ounces, others four or five, and very few ten ounces, unless the uterus was diseased. Baudelocque estimates it as three or four ounces for the French, though Magendie thinks it is often much greater Fitzgerald regards it as amounting to fourteen or fifteen ounces in Spanish women. In Holland, according to Gorter, the discharge does not exceed six ounces. Dr. Meigs states that he is confident that many healthy American women lose fully twenty-one ounces as the regular and normal elimination; while in England authorities calculate that it varies from three to ten ounces, though—as stated in the text—from four to six ounces is probably the average.

[2] Mr. Roberton has pointed out the curious circumstance that the Hindu lawgivers have long since acted upon this notion; for it is enjoined in the Hindu Shastras, that females be given in marriage before their first menstrual discharge, and that should marriage not take place until after this event, then the ceremony is regarded in a sinful light. Moreover, Atri and Kasyapa (Hindu sages) state, "that if an unmarried girl discharges the menstrual fluid at her father's house, the father incurs a guilt similar to that of destroying a fœtus, and the daughter becomes *Brisalee*, or degraded in rank."

sarily a menstruation ; for while the latter is a natural and healthy function, the former frequently occurs as the consequence of local or constitutional disease. Neither should it be inferred, that during each menstruation the rupture of a Graafian vesicle necessarily takes place; or, on the other hand, that a vesicle may not rupture without any external flow of blood. It is only by allowing that the ovarian portion of menstruation may occasionally occur without the uterine part, that those rare cases can be

FIG. 1.



SECTION OF A GRAAFIAN VESICLE FROM THE HUMAN OVARY. (After Valentin.)

At *a* is the follicular membrane, which everywhere incloses the vesicle. The greater part of the cavity *b* is filled up by a peculiar homogeneous fluid. A proper *membrana granulosa*, *c*, covers almost all the inner surface of the follicular membrane. The highest part of the follicular cavity is occupied by the very minute ovule *f g h*; which is everywhere surrounded by a ring or girdle, *e*, called the *zona pellucida*. The *discus proligerus*, *d*, arises from a thickening of the membrana granulosa in the neighborhood of the zone *e*. The ovule itself contains the yolk or vitellus, *f*, the germinal vesicle, *g*, and the germinal spot, *h*.

explained in which pregnancy has occurred prior to any menstrual flow, or in which pregnancy has taken place during lactation without the return of the monthly periods.

On making a section of the human ovary, it is found to contain numerous transparent vesicles, those nearest the surface of the organ being larger than the deeper-seated ones. These cells are the *Graafian vesicles* or *follicles*. Each contains a minute ovule or egg. Each vesicle consists of a closed globular sac, having a fibrous and vascular wall known as the *follicular membrane*. This membrane has a lining of fine granular cells, termed the *membrana granulosa;* the part of this layer nearest the surface being thicker than elsewhere, and being termed the *cumulus proligerus*, or *discus proligerus*. In the centre of this circular mound is the egg or ovule, surrounded by a ring called the *zona pellucida*. As the time approaches for the discharge of the ovule, the vesicle enlarges and projects from the surface of the ovary. Finally,

the vesicle ruptures; the serous contents rush out with the ovule; and the latter, entering the fimbriated extremity of the oviduct, begins its passage to the uterus. At the same time, the old follicular cavity becomes filled with serum or blood, leading to the formation of that dense yellow globular mass which is known as the *corpus luteum*.

In the human female the ovule is supposed to escape towards the termination of the catamenial flow; and sometimes one, or even more, will be discharged from each ovary. The time occupied by the descent of the ovule through the Fallopian tube and uterus is possibly eight or ten days, though nothing positive can be said on this head. During this passage it either perishes, if no fruitful sexual intercourse takes place; or, on the contrary, it becomes impregnated by the nuclei of the sperm cells—spermatic filaments or spermatozoa—of the male, and so gives rise to the formation of the embryo. From all that has been observed during the last few years, it seems most likely that the material contact of the male and female generative elements, in the human subject, takes place in the uterus; which organ must therefore be regarded as the normal seat of conception. It is probably only in exceptional cases, and as the result of some accident, that the spermatozoa reach the Fallopian tubes or traverse them to the ovaries; although this very commonly happens in several of the lower mammalian animals. The researches of Mr. Newport on the ova of the frog confirm the opinion put forward by Dr. Martin Barry in 1843, that impregnation does not take place unless the spermatozoa actually pass through the zona pellucida, or bounding membrane of the ovule, and get into immediate contact with the germ mass, in which they become liquefied. What is the nature of the force communicated by the spermatozoon to the germinal vesicle or germ cell of the ovule, we cannot tell. All that we know is, that those marvellous changes in the ovule which lead to its conversion into the ovum and the development of life, cannot take place without the agency of the sperm cell.

To return from this digression, it may be remarked that the suppression of the menses is generally looked upon as the first reliable symptom of pregnancy; which, from its almost uniform occurrence, is constantly used by women as the test of conception,

and also as affording the best means of calculating the date of parturition. Too much confidence, however, must not be placed upon this symptom; for many circumstances tend to render it inconclusive. Thus, the catamenia may recur regularly for three or four months after conception; while a very few cases are even recorded where they have continued to appear at natural intervals throughout the whole period of utero-gestation. The explanation of this occurrence will appear presently. "A woman," says Dr. Blundell, "supposing herself to be pregnant, asks whether gestation is possible; for, it is added, the system is still regular. To such a query, the answer is, that it is not only possible, but probable; for—notwithstanding what Denman has said to the contrary—I have myself known women in whom, during the first three or four months, the catamenia have continued to flow, though not in so large a quantity, nor so long, as if they were not pregnant; and in rare cases, I am told—though I have not seen any such case myself—the catamenia may continue to flow up to the very last month."[1] In my own case-book I find the notes of a patient who had had one natural labor at the full term, in whom the catamenia appeared regularly every month, usually for three days, during the whole period of her pregnancy. Much more curious are the cases where menstruation comes on for the first time after conception. In 1817, Sir Everard Home related to the Fellows of the Royal Society, the history of a young woman who was married before she was seventeen. She had never menstruated, but pregnancy occurred. Four months after parturition, she became pregnant a second time; and four months after the second delivery, pregnancy again took place. On this occasion she miscarried. Afterwards the catamenia appeared for the first time, and continued to return for several periods until she again became pregnant.

Still more remarkable are those very rare instances in which women menstruate only during pregnancy, and at no other period. Deventer has recorded a case in which he had the opportunity of observing the occurrence of the catamenia during the time of gestation *only*, in the four successive pregnancies of the same woman.

It has been observed since the time of Aristotle—and the cir-

[1] The Principles and Practice of Obstetric Medicine, p. 1053. London, 1840.

cumstance has been confirmed by many modern authors—that not only may pregnancy take place without the previous occurrence of any catamenial discharge, but also after the total cessation of the menses. For pregnancy to happen during lactation, without the recurrence of any menstrual period, is by no means so uncommon. Several years ago I delivered a poor woman of her second infant, while her first child—fourteen months old—was unweaned, and was actually at the breast half-an-hour before the completion of labor. The following case is another proof that suckling will not always prevent pregnancy:

Mrs. A. E., ætat. 24. Consulted me on the 16th January, 1867. Has been married nearly five years. Has been pregnant three times: has had three children, the last having been born on 1st July, 1866. She suckled this infant for rather more than four months, and then weaned it, as the courses came on and lasted from the 9th to the 15th November.

Since the time of her marriage in March, 1862, until now, the catamenia have only been on twice; viz., in April, 1862, and November, 1866. Has always got pregnant while suckling. The first child was weaned, owing to pregnancy occurring, when it was nine months old; the second, for the same cause, when thirteen months old; and the third, as before stated, when it was four months old Is now about two months advanced in her fourth pregnancy.

The explanation of all such facts as the foregoing seems to be this,—that the capital phenomenon in the function of menstruation consists in the maturation and periodical discharge of the ovules, the hemorrhage being but a secondary phenomenon. Hence, the terms ovulation and menstruation are not strictly synonymous.

On the other hand, the practitioner will be liable to be misled if he concludes, that because a patient states she menstruates regularly, therefore she really does so. Every woman who has a discharge of blood from the vagina during pregnancy—or indeed at any other time—will attribute it to "her courses;" though the bleeding may be due to a polypus hanging from the cervix uteri into the vagina, or even—as in an instance which came under my own observation—to a mass of epithelial cancer. The irregular hemorrhages which occur during the latter portion of gestation from placental presentation, have also been mistaken for the catamenial secretion. There can be no doubt, also, that in some cases the discharge is due to inflammation and excoriation of the cervix uteri; the excoriated surface bleeding freely on being

touched, or on the uterus becoming more than usually congested by the pressure of a loaded rectum, &c. These cases are very important, not merely in a physiological point of view, but really as regards the patient's welfare; for if the diseases to which I have alluded are allowed to go unchecked by art, abortion is very likely to be the result.

From the foregoing it seems to me, that if we take a certain number of the cases in which menstruation is reputed to take place regularly during pregnancy, and subtract those in which there is merely hemorrhage from some morbid condition of the uterus, we shall reduce the number very materially. Granting this, then, the question arises—How are the real cases of menstruation during the first three or four months of gestation to be accounted for? The explanation of this point has been for many years a stumbling-block to physiologists; for so long as the decidua was regarded as a distinct exudation from the mucous membrane of the uterus, the occurrence of menstruation after the formation of this membrane seemed impossible. Until the last few years the opinion has always been maintained, that the earliest effect of successful impregnation was the formation of a new membrane in the cavity of the uterus; which membrane (the decidua) was believed to resemble a complete bag, occluding the os uteri and the orifices of the Fallopian tubes. As the fecundated ovum descended, it was said to push before it that portion of the decidua which had been formed over the uterine extremity of the Fallopian tube: and so the embryo entered the uterine cavity, covered really with two layers of decidua. The layer of this membrane lining the uterus was called the decidua vera; while that part pushed forward by the ovum, and closely enveloping it, was termed the decidua reflexa.

The fallacy of these specious hypotheses has now been proved by the simple discovery that the decidua is not a new tissue, but merely the congested and swollen uterine mucous membrane; so that the orifices of the Fallopian tubes and of the cervix are not closed. When the ovule or egg, propelled by the vermicular action of the Fallopian tube, enters the cavity of the uterus, it finds the mucous lining of this organ considerably hypertrophied. The progress of the ovule being much impeded by this swollen velvety membrane, there is more time given for fecundation to occur. Should it happen, the fecundated ovum either takes root,

as it were, and becomes embedded in a fold of decidua which closes around it, forming the decidua reflexa; or, possibly, having dropped into one of the openings leading to the utricular follicles, it there forms the decidua reflexa by drawing around it—as suggested by Bischoff, Farre, and Otto Funke—the soft and spongy decidua constituting the walls of the orifice. Now it is clear that until the ovum so enlarges as to force the decidua reflexa into close and firm apposition with the decidua vera, there can be no mechanical obstacle to the flow of the menstrual blood; and by consequence—as will again be shown in a succeeding chapter—none to the occurrence of superfœtation. Dr. J. Matthews Duncan has given a description of a beautiful preparation taken from the body of a pregnant woman, who died in consequence of disease which was quite unconnected with the uterus or its functions. Judging from the development of the fœtus, she had arrived at least at the eighth week of pregnancy. The mucous membrane lining the body of the uterus was seen to be of great thickness, while that coating the cervix was unchanged. The openings of the cervix uteri and of the Fallopian tube of the left side were easily seen, but that of the right tube had been destroyed in dissection. The decidua reflexa completely covered the ovum, being a thin layer without glands, springing from the decidua vera. The cavity of the uterus was still not closed, there being ample space all around the ovum between the two parts of the decidua, from the os uteri to the tubes.

There are only two remaining points to notice. In the *first* place, with regard to the time at which the decidua reflexa comes into apposition with the decidua vera. On this head it seems to me difficult to speak positively. According to Dr. J. Matthews Duncan it is probably about the third month; but I am inclined to believe that it does not happen until later. Certainly, the surfaces of the decidua vera and reflexa do not become fused into a single layer until towards the end of the seventh month. And indeed, it is not impossible that in some rare instances the decidua vera and the decidua reflexa remain non-adherent during the whole term of pregnancy. It is in such cases, probably, that menstruation has continued to recur regularly during the whole term of gestation; the discharge coming from the decidua vera, as it ordinarily does from the uterine mucous membrane in the non-pregnant state. *Secondly*, physiologists assert that the menses

cannot escape from the cavity of the uterus during pregnancy, because a plug of viscid cervical mucus acts as an obstacle. To this it need only be replied, that the plug is as dense in the non-menstruating and unimpregnated uterus as in the impregnated; and, since it offers no obstacle in the one case, there is no reason why it should do so in the other.

The menses become suppressed from many other causes than pregnancy. In young newly-married women we not uncommonly find that two or three periods are passed over without any assignable cause; and as, at the same time, the breasts increase in size, and get rather tender, the anxious wife readily, but erroneously, believes that she is "as she would wish to be." Moreover, the catamenia often cease or become irregular from cold, from shocks to the nervous system, and from disease—especially, perhaps, in consequence of advanced ovarian affections and confirmed phthisis;—or they may stop at an unusually early age, owing to some constitutional peculiarity. At "the change of life" too, intermissions of several periods, before final cessation, are very frequent. The fact has already been noticed, that women who are suckling may conceive—especially if they continue nursing for too long a period—without the previous reappearance of the catamenia; and hence instances are met with where, from a rapid succession of pregnancies, menstruation has not occurred for years. It must also be remembered that the discharge of the catamenia may be prevented by adhesions forming between the vaginal labia, or by an imperforate hymen; and as the retained secretion enlarges the uterus, so it gives rise to symptoms which are not unlikely to be attributed to the presence of a fœtus. An attempt at a vaginal examination will detect the obstruction; while a cautious division of the membrane will give exit to the collection of fluid. This has been found to amount to two or three pints, or more.

Lastly, there is a source of deception which we cannot easily prevent, and it is this. A young girl, fearing she is pregnant, and presenting evidence to the eyes of others that she is so, will assert boldly that her courses are regular, although they have quite ceased. To prevent detection she will possibly carry the trick so far as to stain her linen every month with blood.

Section 3.—Nausea and Vomiting.

It is of course obvious, that the occurrence of gastric disturbance is not of much value by itself as a sign of pregnancy. For while, on the one side, obstinate nausea and vomiting are caused by a great variety of circumstances quite independently of the presence of a fœtus in the uterus; so, on the other hand, the whole period of gestation may be passed through without their occurrence. Nevertheless, when a woman has conceived, the stomach frequently becomes very irritable, so that much suffering ensues from the nausea and sickness which result; these symptoms occasionally coming on within three or four days of conception, and sometimes being deferred until about the commencement of the fourth week.

Speaking in general terms, there are certain facts with regard to these attacks which should be borne in mind. Thus, they are usually most distressing in the early part of the day; whence they have commonly come to be spoken of as "the morning sickness." The duration of the daily attack varies from a few minutes to an hour or even longer. When it has ceased, there is often a desire for food; and a moderate breakfast seems to remove all discomfort, especially if the sufferer will remain quiet in bed for a short time after taking it. The sickness is peculiar, inasmuch as it is not due to dyspepsia, but to sympathetic gastric irritability—reflex irritation. As a rule, the patient does not vomit her food undigested, but merely ejects the mucous secretions of the stomach. In exceptional instances, without a doubt, the irritability is so great that the stomach will retain nothing, not even iced water; but of these I am not now speaking. The nausea may persist during the whole time of pregnancy; or it may cease spontaneously—as it does in the great majority of cases—about the beginning of the fourth month. Sometimes, the sudden cessation is said to have been the first indication of some unfavorable change in the woman's system, or of the death of the embryo, or it has proved the immediate forerunner of abortion. The authorities who promulgate this opinion generally assert also that utero-gestation proceeds more regularly and favorably when vomiting is present than when it is absent. But I am inclined to believe that this is one of those traditions which has met with

credence more from frequent repetition, than because it contains any germ of truth; just as is the case with the old midwife's proverb that a sick labor is a safe one. In instances where the sickness continues during the whole of pregnancy, or when it returns in the latter months, it will generally be found that there is some concomitant uterine disease. This point, with others bearing on this matter, will be again referred to in the chapter on the disorders of the digestive organs.

The same sympathetic action which gives rise to the morning sickness may likewise induce loss of appetite, a distaste for animal food, longings for unusual articles of diet, as well as a disposition to *diarrhœa*. Not very uncommonly, also—as has been noticed since the days of Hippocrates—the salivary glands become affected, inducing copious *salivation*. The latter is distinguished from mercurial ptyalism by the absence of sponginess and soreness of the gums, by the non-existence of any ulcerations upon the sides of the tongue, by the freedom from pain about the jaws, and by the odor of the breath remaining inoffensive, or comparatively so. Moreover, there is no fever, and little or no constitutional disturbance. The quantity of saliva which is discharged is sometimes surprising. In one case, with the particulars of which I am acquainted, three or four quarts were excreted daily.

Section 4.—Mammary Sympathies.

When the catamenia have been suppressed for about two periods, the pregnant woman begins to experience a feeling of fulness, increased firmness, tenderness, and throbbing of the breasts; together, frequently, with a sensation of soreness in the nipples. Sometimes these symptoms set in much earlier. I recollect attending a delicate lady in her confinement, who assured me, that from the end of the first fortnight of pregnancy until the termination, she was seldom free from very great uneasiness in both mammæ; the tension and weight and throbbing being at times almost unbearable. Generally speaking, however, it is not until the end of the eighth week of gestation that the breasts increase in size and firmness. They then present a knotty and uneven and glandular feel; the blue veins coursing over them begin to be more developed; the circles around the nipples get

gradually altered in color and in structure, constituting the areolæ; while about the same date, or perhaps somewhat later, milk may be secreted. If it be a first conception, the glands lose their conical shape and become more hemispherical. At the same time it must be remembered, that some of these changes can occur from other causes than pregnancy; for the breasts often enlarge simply from the excitement produced by marriage, from accidental suppression of the menses, and from some diseases of the uterus or its appendages. In more than one case of cancer of the uterus I have witnessed the sympathetic pains in the breast form a source of serious distress; while I have seen the same thing happen occasionally in instances of chronic metritis, uterine fibroid tumors, and more especially in subacute ovaritis. So, again, a feeling of fulness and pain in the breasts, with a slight deepening in the color of the areola, may be experienced by delicate women of an irritable temperament upon each appearance of the catamenia; although then, these symptoms instead of being persistent decrease as the discharge ceases, and in a few days afterwards subside entirely.

The alteration in that part of the breast around the nipple—the *areola*—deserves great attention; since when all the changes to be detailed occur, a very strong presumption of the existence of pregnancy is afforded. At the end of the second month, the puffy turgescence of the nipple and surrounding disk is usually visible; the little glandular follicles, sixteen or twenty in number, are seen to be getting more developed; and the color of the areola is observed to consist of a deep shade of flesh tint with a slight brownish hue. These appearances have been admirably described by Dr. Montgomery, who says,—"During the progress of the next two or three months, the changes in the areola are in general perfected, or nearly so; and then it presents the following characters: a circle around the nipple, whose color varies in intensity according to the particular complexion of the individual, being usually much darker in persons with black hair, dark eyes, and sallow skin, than in those of fair hair, light-colored eyes, and delicate complexion. The area of this circle varies in diameter from an inch to an inch and a half, and increases in most persons as pregnancy advances, as does also the depth of color. I have seen the areola, at the time of labor, almost black, and upwards of three inches in diameter, in a young woman of very dark hair

and complexion; while in another instance, in a lady who had borne several children, its breadth around the base of the nipple did not, at any time of gestation, amount to a quarter of an inch, and, at first, was not more than an eighth; this circle, however, narrow as it was, was studded at nearly regular intervals with the glandular tubercles, which were not unlike a ring of beads. In negro women the areola becomes jet black, with somewhat of a purple shade through it. In the albino it is of a delicate rose color."[1] While the alterations thus described are taking place, the breasts get fuller and firmer, and the veins ramifying over their surface increase in size; the nipples become turgid, slightly enlarged, and covered at their apices with small branny scales; the glandular follicles on the areolæ appear prominent, and the integuments covering these parts become raised and soft and moist and turgescent; and, lastly, numerous small mottled patches are seen scattered over the outer portion of the areola and the parts immediately around, presenting an appearance as if, says Dr. Montgomery, "the color had been discharged by a shower of drops falling on the part." This last appearance is seldom observed before the fifth month, and is a distinctive sign of pregnancy.

The formation of the color of the areola depends upon the deposit of actual pigment beneath the cuticle; and it is curious that a similar deposition is also often found in pregnancy around the umbilicus, down the middle of the abdomen forming a brown line, and sometimes around the eyes. More rarely the skin of the arms and hands has been found to assume a yellowish-brown hue, like that of a mulatto. The evidence derived from the color of the areola is most conclusive in a first pregnancy; for, although the coloring matter is sometimes rather rapidly removed after delivery, yet most frequently it is not entirely absorbed. The varied appearances presented by the areolæ, at different periods of pregnancy, are well shown in the excellent drawings by Dr. Westmacott prefixed to this volume. The sketches for Plates I and IV were made from primiparæ: those for Plates II and III were from multiparæ. The woman who furnished the sketch for Plate III was a brunette; while the complexion was fair of the patient whose breast is shown in Plate IV.

[1] An Exposition of the Signs and Symptoms of Pregnancy. Second edition, p 106. London, 1856.

William Hunter had such faith in these altered states of the areolæ, that he always asserted he could judge by them alone whether or not a woman was pregnant. The story goes, that on one occasion a subject was brought to him for anatomical purposes. On carefully looking at the breast, he declared, from the appearance of the areola, that the female had died while pregnant. One of his pupils, on examining the genitals, found the hymen perfect; but Hunter still maintained his opinion, and, on opening the uterus, it was found to contain a small fœtus.

The shining silvery streaks or scars, which are often seen radiating from the centre to the circumference of the breast, afford conclusive evidence that pregnancy has existed at some time or other. They are, however, of no importance as signs of a present conception. Such streaks are the result of over-distension of the gland, and when once formed are never removed. Very similar appearances are produced in the integuments of the abdominal walls, through the stretching of the skin by a large gravid uterus or an ovarian tumor.

The *secretion of milk* by the breasts is not, if taken by itself, usually considered to be of any diagnostic value; though when it occurs in combination with other symptoms of pregnancy—especially if the woman has never given birth to a child—most observers allow that it then assumes a certain degree of importance. The reason for this reservation is the well-known fact, that the breasts may occasionally take on their natural functions without the existence of pregnancy, or indeed, without the woman ever having indulged in sexual intercourse. Before mentioning the grounds for my opinion that the secretion of milk in a first pregnancy is a valuable sign of the existence of this condition, reference had better be made to the chief cases which are usually quoted to show the fallacy of this test. Thus, M. Donné has noticed that he found a fluid in the breast of a young woman, who was said never to have been pregnant, which presented all the microscopic characters of milk.[1] Baudelocque mentions the case of a girl, eight years old, who milked her breasts before the Royal Academy of Surgery in Paris; while Belloc refers to a similar instance. In both of these instances the cause of the secretion was the same, namely, the application of a child to the

[1] Cours de Microscopie, p. 441. Paris, 1844.

breasts. I am told that it is not uncommon in Western Africa for young girls who have never been pregnant to regularly employ themselves in nursing the children of others; the glands being excited to action by friction with the juice of one of the Euphorbiaceæ. Many of the native women of New Zealand endeavor to keep up a flow of milk from the breasts for years; so that a Maori woman who cannot find a child in need of a foster-mother will suckle a little pig. One gentleman informed Dr. Tuke, that he actually saw a child, five or six years of age, alternately "taking a pull" at his mother's pipe and breast. So, again, it is certain that the stimulus imparted by sucking the nipple will make the mammary glands of old women perform their functions anew. Dr. Livingstone, speaking of the Bechuanas, tells us that he examined several cases in which a grandmother took upon herself to suckle a grandchild. He relates especially, that—

> Masina of Kuruman had no children after the birth of her daughter Sina, and had no milk after Sina was weaned, an event which usually is deferred until the child is two or three years old. Sina married when she was seventeen or eighteen, and had twins; Masina, after at least fifteen years' interval since she last suckled a child, took possession of one of them, applied it to her breast, and milk flowed so that she was able to nurse the child entirely. Masina was at this time at least forty years of age. I have witnessed several other cases analogous to this. A grandmother of forty, or even less, for they become withered at an early age, when left at home with a young child, applies it to her own shrivelled breast, and milk soon follows. In some cases, as that of Ma-bogosing, the chief wife of Mahure, who was about thirty-five years of age, the child was not entirely dependent on the grandmother's breast, as the mother suckled it too. I had witnessed the production of milk so frequently by the simple application of the lips of the child, that I was not therefore surprised, when told by the Portuguese in Eastern Africa of a native doctor who, by applying a poultice of the pounded larvæ of hornets to the breast of a woman, aided by the attempts of the child, could bring back the milk. Is it not possible that the story in the "Cloud of Witnesses," of a man during the time of persecution in Scotland, putting his child to his own breast, and finding, to the astonishment of the whole country, that milk followed the act, may have been literally true? It was regarded and is quoted as a miracle; but the feelings of the father towards the child of a murdered mother must have been as nearly as possible analogous to the maternal feeling; and as anatomists declare the structure of both male and female breasts to be identical, there is nothing physically impossible in the alleged result. The illustrious Baron Humboldt quotes an instance of the male breast yielding milk; and though I am not conscious of being over credulous, the strange instances I have examined in the opposite sex make me believe that there is no error in that philosopher's statement.[1]

[1] Missionary Travels and Researches in South Africa, p. 127. London, 1857.

The two instances noticed by Dr. Livingstone in the above quotation are without a doubt quite authentic; since the fact has been noticed by others that, under certain circumstances, the male breasts will secrete milk. The Bishop of Cork has given an account, in the *Philosophical Transactions* for 1741, of a man who succeeded in suckling and rearing his child after the death of the mother. In Captain Franklin's *Narrative of a Journey to the Shores of the Polar Sea in* 1819, *&c.* (p. 157, London, 1823), there is a most interesting description of a young Chipewyan, whose wife died three days after giving birth to a boy. To preserve the life of this infant, the widower nourished the child from his own breast, and was successful in rearing him. The case of a robust soldier, twenty-two years of age, with well-formed genital organs, whose mammæ acted so efficiently that on one occasion a wineglassful of milk was drawn off, is related in Schmidt's *Jahrbücher* for July, 1837. The most perfect case of this kind, and perhaps the most satisfactory, is given in the writings of Dr. Dunglison. This gentleman says:

> Professor Hall, of the University of Maryland, exhibited to his obstetrical class, in the year 1837, a colored man, fifty-five years of age, who had large, soft, well-formed mammæ, rather more conical than those of the female, and projecting fully seven inches from the chest, with perfect and large nipples. The glandular structure seemed to the touch to be exactly like that of the female. This man had officiated as wet nurse for several years in the family of his mistress; and he represented that the secretion of milk was induced by applying the children intrusted to his care to the breasts during the night. When the milk was no longer required, great difficulty was experienced in arresting the secretion. His genital organs were fully developed.[1]

Now it may at first sight appear strange, that notwithstanding these cases, I am very much disposed to believe that the presence of milk in the breasts of a woman who has never given birth to a child is an early and reliable sign of pregnancy. I may even go further and say, that when there has been a previous pregnancy the presence of milk is an important sign that the woman is at the time gravid, provided three or four years have elapsed since the date of last giving suck. It is necessary to make these limitations, because the fact is beyond dispute, that a small quantity of milk may remain in the breasts for some months after suckling has been abandoned, and may easily be expressed by

[1] Human Physiology. By R. Dunglison, M.D., &c. Seventh edition. Vol. ii, p. 514. Philadelphia, 1850.

the fingers. I have so often succeeded in doing this, where there has been neither pregnancy nor lactation going on at the time, that I can speak positively on the matter. But the reasons for my reliance on the milk test are founded on the experience which was obtained during a long attendance in the hospital out-patient room; in which place I have, in at least two or three dozen cases, diagnosed the existence of pregnancy from the presence of the mammary secretion alone, though the fluid could be expressed only in a very small quantity. So early as the ninth and tenth weeks has this sign held good; and, as far as can be known, it never led me into error. In resorting to this test, the fluid must be pressed up from the mammary gland, and brought by persuasion, as it were, to the point of the nipple. A single drop of a slightly viscid, serous-looking fluid is sufficient; provided the drop, on being microscopically examined, is found to contain the characteristic milk globules, with large oil particles, and colostrum granules. The latter seem always to be present under the circumstances mentioned, just as they are found in the secretion of recently-delivered women. Of course, if there were reasons for believing that the girl had been stimulating the mammary glands by the application of any galactagogue, or by allowing the nipples to be sucked by an infant, I should reject the evidence afforded by the existence of a few drops of milk. But young women who come to us to be cured of amenorrhœa, though they may have been unable to curb their passions, have not usually been anxious to prematurely develop their breasts. Whatever may be the case in New Zealand and in South Africa, it is certain that in this country, girls and single women do not occupy themselves as wet-nurses.

By way of summing up the preceding observations it may be said, that the circumstances which ought to be specially considered in examining the breasts for the purpose of ascertaining the existence or absence of pregnancy are as follows: The increase in the fulness and firmness of the entire gland; the enlargement of the veins coursing over the breast, especially if they traverse the areola; the development of the glandular follicles or tubercles; the progressive increase of color in the areola; the soft, humid, slightly raised condition of the cuticle within the areola; the formation of small round spots or mottled patches about the circumference of the areola, and on the adjacent skin;

and the secretion of milk. Where these conditions all coexist in any given instance, a positive opinion may be entertained that the woman is pregnant; though the absence of any one or more of them is not to be taken as indicative of the reverse. The mammary sympathies are sometimes entirely wanting, notwithstanding that gestation is progressing favorably. Conversely, when all these changes are present and well-marked they may at once begin to fade on the fœtus perishing, even though the dead body should be retained in the uterus for some time afterwards. And, finally, it may be laid down as a law, that when a woman is gravid for the first time, and has missed two monthly periods, a drop or more of fluid may be expressed from the breasts, which, on minute examination, will be found to present all the characters of true milk; while from the presence of even this small quantity, in the great majority of cases, we may alone successfully predicate the existence of pregnancy.

Section 5.—Enlargement of the Abdomen.

The progressive enlargement of the abdomen, if not a very certain, is at all events a very familiar symptom of pregnancy, to which the unlearned attach much more importance than we shall find it merits. During the first thirty or forty days after impregnation the uterus falls rather low down in the pelvis, whilst its fundus is inclined backwards; so that the abdomen is even flatter above the pubes—as is proverbially known to be the case—than it was prior to this event. It is not until about the end of the twelfth week that the womb ascends just above the level of the symphysis pubis, and that the flattening gives place to augmented fulness in the hypogastric region; the enlargement increasing from week to week, as the—at first round, but afterwards oval—uterine tumor becomes more and more developed.

About the middle of the fifth month the fundus of the uterus can generally be felt midway between the umbilicus and pubes; by the end of the sixth month it may be detected reaching to the umbilicus, or a little above it; in another month it is two inches higher; at the close of the eighth month it is found in the epigastric region; while before the termination of the ninth month, the fundus closely approaches the scrobiculus cordis—as

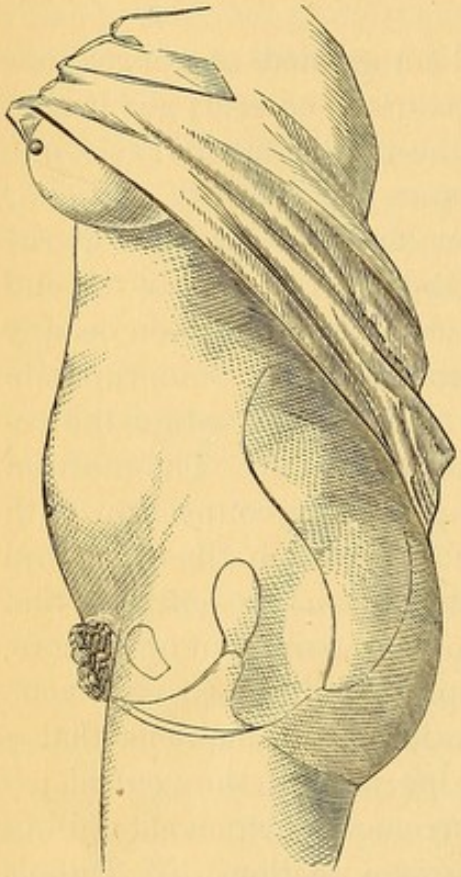
the depression which exists immediately below the ensiform cartilage of the sternum is usually termed. The annexed diagrams illustrate the most marked of these changes. A few days prior to the setting in of labor the uterus sinks rather lower; this being more particularly noticeable in women who have a roomy pelvis.

The foregoing statements are to be regarded as approximations to the truth rather than as absolutely correct; for it is of course obvious that the elevation of the fundus must vary somewhat according to the size of the fœtus, the quantity of liquor amnii, &c. In all instances, however, we find that the uterus fills completely the fore part of the abdomen at nearly the end of pregnancy. The ascending and descending colon then occupy either side; the transverse colon, stomach, and omentum are pushed up between the fundus and diaphragm; while the remainder of the viscera lie posterior to the womb. The position of the small intestines—which, owing to their connection with the mesentery, cannot be displaced—between the vertebral column and the posterior surface of the uterus, is not only that in which they best escape any injurious pressure, but one where, by their elasticity, they can serve to protect the aorta and vena cava from any undue weight. Occasionally it happens that a piece of intestine slips between the uterus and the ventral parietes; an anomaly, the possible occurrence of which should not be forgotten in performing the Cæsarean section. M. Dubois met with it in practising this operation in 1839.

The enlargement of the abdomen which is due to pregnancy must not be confounded with that which arises from mere tympanitic distension of the intestines; from which it should be remembered, some women suffer for many days after conception. Still more important is it to distinguish the enlarged pregnant uterus from the increase in size due to ascites, ovarian dropsy, fibroid tumors of the uterus, hydatid tumors of the liver, and renal enlargement. The diagnostic signs between these various conditions require to be considered at some length, and hence the succeeding chapter will be chiefly devoted to this subject. It may, however, be here remarked that the enlargement of the abdomen from pregnancy is always greater anteriorly than laterally, especially in multiparæ; that the inferior part of the thorax is less expanded than in diseases of the viscera producing large tumors;

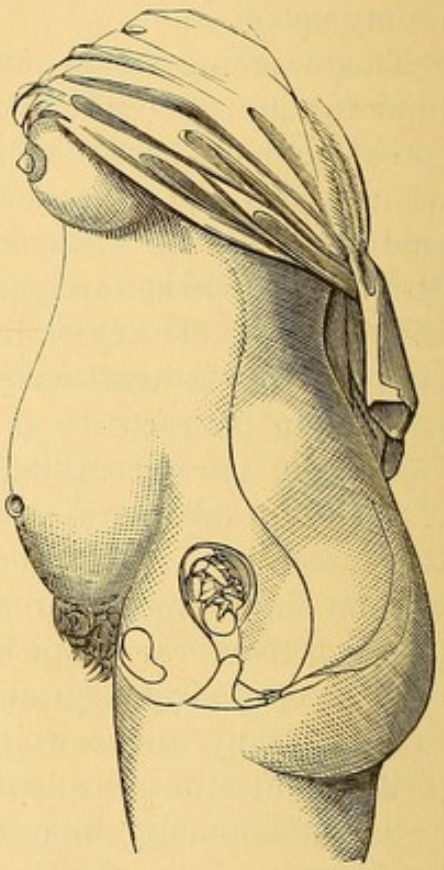
that change of posture alters very slightly the appearance or form of the swelling; and that the flanks do not bulge outwards as in ascites, when the patient is placed upon her back.

FIG. 2.



ABDOMEN AND UTERUS IN UNIMPREGNATED STATE.

FIG. 3.



ABDOMEN, AND UTERUS WITH ITS CONTENTS, IN THE THIRD CALENDAR MONTH OF GESTATION.

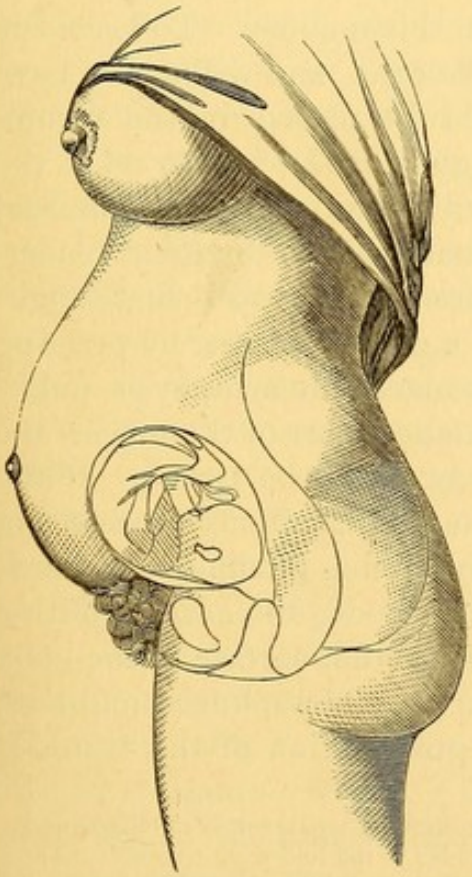
When the fœtus dies, whatever the period of gestation may be, the growth of the uterus is of course arrested; and consequently the abdomen then ceases to enlarge, even though the dead body be retained until the ninth month. Cases of this kind are always very puzzling, and sometimes it is impossible to give a decided opinion upon their nature. The following is an illustration of this difficulty.

About the end of the year 1859, I was consulted by a married lady, forty-four years of age, who complained of an abdominal tumor. She told me that her husband was some ten years older than herself, that she had been married twenty-three years, and that it was twenty-two years since her first and only pregnancy. Six months before consulting me she began to suffer from morning sickness, while her courses ceased. She referred these symptoms to the

change of life; and did not give up her opinion even on finding the abdomen beginning to enlarge. After passing over four catamenial periods the sickness ceased, and the enlargement remained stationary. On examining the abdomen, I found a soft, oval, elastic tumor, reaching nearly to the navel; there was dulness on percussion over it, but I could detect only a feeble uterine murmur, and no fœtal heart-sounds. The finger introduced into the vagina discovered the cervix of normal condition, and the uterus enlarged; while on practising ballottement, I fancied I could detect a fœtus falling with a very light pat on my finger. I gave a guarded diagnosis; but at the same time stated that I thought she was pregnant, and that the child was dead. This proved to be the case. Three months afterwards labor pains came on, and she was delivered of a shrivelled fœtus about the size usually attained at the fifth month.

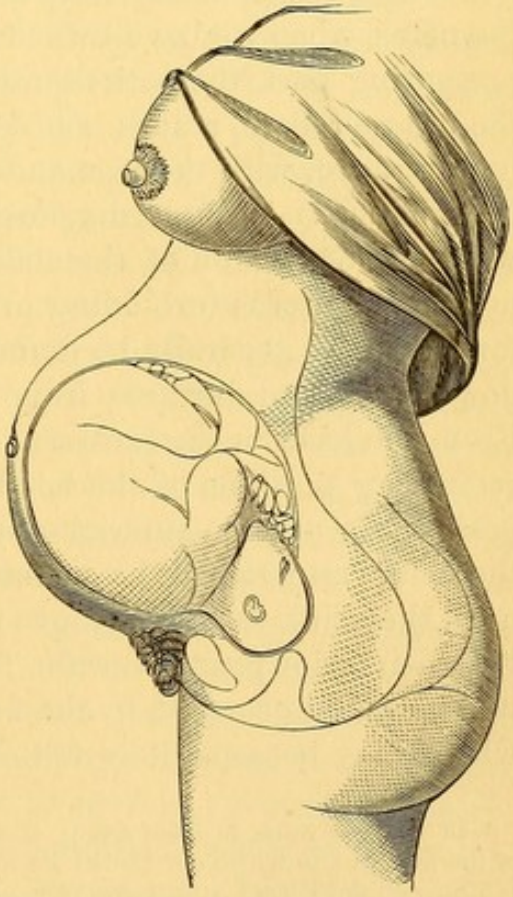
As the abdomen enlarges, the umbilicus becomes gradually less hollow than before conception, so that by the sixth month

FIG. 4.



ABDOMEN, AND UTERUS WITH ITS CONTENTS, IN THE SIXTH CALENDAR MONTH OF GESTATION.

FIG. 5.



ABDOMEN, AND UTERUS WITH ITS CONTENTS, IN THE NINTH CALENDAR MONTH OF GESTATION.

its depression has almost disappeared; while a few weeks later it is on a level with the integuments of the abdomen, or even projects above them. Occasionally also, a dark disk or areola is

developed around the navel; from which discoloration a brown streak, about a quarter of an inch in breadth, runs downward to the pubes. This line, however, often exists quite independently of pregnancy. I have seen it on several occasions in single women suffering from fibroid tumors of the uterus, about whose chastity there could be no doubt.[1] The emergence of the umbilicus likewise takes place whenever the abdomen becomes greatly distended, being merely due to the mechanical stretching of the parts.

During the last four or five weeks of pregnancy, careful palpation of the abdominal surface will often enable us to learn the position of the fœtus in utero. We may even in transverse presentations rectify the position by external manipulations: although, as the child is very movable in the amniotic cavity, it is difficult to permanently keep the head in the superior strait of the pelvis when we have turned it in this manner. To learn the presenting part, the patient must be calm, and willing to have the examination made; she should be placed in the recumbent posture, with the legs and thighs flexed, so as to relax the integuments. A clear diagnosis will be prevented by unusual thickness or tension of the abdominal walls, or by great tenderness of the uterus forbidding pressure. The head is first sought for, and may generally be found as a globular mass, by pressing downwards and inwards from just above the symphysis pubis. From the head in the lowest and smallest part of the uterus, the remaining portions of the fœtal body are to be traced. If the position be a dorso-anterior one, the small spinous processes of the fœtal vertebræ will be detected by passing the fingers upwards until they sink into the groove which divides the nates. With a ventro-anterior position of the fœtus, the flat surface of the belly will be found occupied by the fore-arms, elbows, knees, and legs, which may be separately felt. A presentation of the trunk is

[1] Of still less value, in other words, of no significance whatever, is the discoloration of the forehead, to which old Daniel Turner alludes in the following passage: "There is a Spot on the Face, I must just stay to mention, more peculiar, according to our great Master Hippocrates, to big Belly'd Women, and reckon'd as one of the Signs of Conception, nay, according to one of his Aphorisms, a *Criterion* (tho' fallible) of the Sex also; Where he saith *Quæ Utero gerentes, Maculum in facie veluti ex solis adustione habent, eæ fœmellas plerumque gestant.* To this Spot or Mark authors have generally given the name of *Ephélis.* Sennertus describes it as a tawny, dark, or dusky spot, principally seated on the Foreheads of breeding women, and spreading both in length and breadth at sometimes to the compass of the palm of the hand, without asperity or inequality: contrary to Celsus, who calls it *Asperitas quædam et durities, mali coloris.*" A Treatise of Diseases Incident to the Skin, p. 181. London, 1714.

indicated by the shape of the maternal belly, the transverse diameter of which will exceed the longitudinal. The child's head will also be felt in one of the iliac fossæ; and if a vaginal examination be made, no portion of the presenting part of the fœtus can be detected. Dr. G. C. P. Murray states,[1] that by palpation, together with auscultation, we may determine, in a vertex presentation, whether it be a first, second, third, or fourth position. Thus, if the fœtal spine is to the left of the maternal umbilicus or mesial line, it is a first position; if to the right, it is a second position; if the prominent knee and elbow are found to the right of the maternal umbilicus or mesial line, and the sounds of the fœtal heart are heard most distinctly near the mesial line, it is a third position; while, if the prominent knee and elbow are found to the left of the mother's umbilicus, and the sounds of the fœtal heart are heard distinctly quite towards the right flank of the mother, it is a fourth position. In speaking of first, second, &c., the nomenclature of Churchill is adopted. Should two fœtal heads be felt, we have of course evidence of a plural pregnancy.

The successful way in which unmarried females who are pregnant manage to conceal all external appearances of their condition, by some arrangement of the dress and a skilful mode of walking, is often very remarkable. It not unfrequently happens that servants are delivered at the full period of gestation, in the houses of their employers, who have seen them daily at their work without entertaining the least suspicion of the state of affairs. A mistress, however, will possibly overlook an alteration in her servant's appearance which a keen-eyed stranger will at once notice; simply because the increase in size has taken place by imperceptible degrees, and the sight has become accustomed to it. The practical hint which should be deduced from the foregoing circumstance is this: That when consulted as to the cause of the catamenia having ceased, the physician had better put no trust in appearances; but if there be morning sickness, enlargement, &c., of the breasts, or other conditions such as to arouse his suspicions, he ought carefully to examine the abdomen by inspection and palpation and percussion. Where there is any tumor, auscultation must be practised. The dress and petticoats are to be removed; and the woman—her bladder being empty—

[1] The Lancet, p. 262. London, 13th March, 1858.

should be lying down on her back in bed, with the knees slightly drawn up.

Section 6.—Movements of the Fœtus.

The movements of the fœtus are usually felt by the mother about the sixteenth week after conception; the term *quickening* being commonly employed to designate the parent's first perception of motion. This expression is an unfortunate one. It tends to perpetuate the erroneous idea—still maintained by the English law[1]—that at this period the child first becomes alive, or quick;

[1] By the Ellenborough Act, passed in 1803, it was ordained that any person wilfully causing abortion in a woman *not quick with child* should be fined, imprisoned, whipped, or transported for any term not exceeding fourteen years; but if the offence were committed *after quickening*, it was punishable with death. Within the last few years the law has been twice altered. By the statute for the consolidation of criminal law (24 and 25 Vict. c. 100, ss. 58, 59), which came into operation in 1861, it is now clearly enacted: "Every woman, being with child, who, with intent to procure her own miscarriage, shall unlawfully administer to herself any poison or other noxious thing, or shall unlawfully use any instrument or other means whatsoever with the like intent, and whosoever, with intent to procure the miscarriage of any woman, whether she be or be not with child, shall unlawfully administer to her or cause to be taken by her any poison or other noxious thing, or shall unlawfully use any instrument or other means whatsoever with the like intent, shall be guilty of felony, and being convicted thereof shall be liable, at the discretion of the court, to be kept in penal servitude for life, or for any term not less than three years—or to be imprisoned for any term not exceeding two years, with or without hard labor, and with or without solitary confinement.—Whosoever shall unlawfully supply or procure any poison or other noxious thing, or any instrument or thing whatsoever, knowing that the same is intended to be unlawfully used or employed with intent to procure the miscarriage of any woman, whether she be or be not with child, shall be guilty of a misdemeanor, and being convicted thereof, shall be liable, at the discretion of the court, to be kept in penal servitude for the term of three years, or to be imprisoned for any term not exceeding two years, with or without hard labor." It had been previously ruled by the judges (Regina *v.* Goodall, Notts. Assizes, 1846), that a person making the attempt to produce abortion on a female erroneously deemed to be pregnant, could be convicted under the former statute of 1 Vict. c. 85, s. 6. The *intent* was very properly said to be the same whether the woman were pregnant or only thought to be so. On this point the French code is the same as the law of England. In 1846, a woman was sentenced to eight years imprisonment for attempting to produce abortion in a female who was subsequently proved to be only afflicted with an ovarian tumor (Annales d'Hygiène, &c., vol. i, p. 466. Paris, 1847).—The law in this country, moreover, makes no exception with regard to medical men inducing premature labor to benefit the female or her child; but as this operation would be undertaken without any criminal design, and only from an obvious necessity, so it could not be held as unlawful. It ought, however, to be laid down, as a rule of medical ethics, that no practitioner is justified in having recourse to this proceeding without a consultation with one or more of his professional brethren.

With respect to the plea of pregnancy in bar of execution, the English law is still ridiculous and cruel; for when a woman is capitally convicted, and pleads pregnancy, the question of pregnancy is allowed to be determined by a jury of twelve ignorant women, and the respite is made to depend, not upon the proof of pregnancy, but upon the question of the woman having *quickened*. As Paris and Fonblanque remark, in their work on Medical Jurisprudence (vol. iii, p. 141, London, 1823): "The law of the land is not only at variance with what we conceive to be the law of nature, but it is at variance with itself; for it is a strange anomaly, that by the law of real property an infant *en ventre sa mère* may take an estate from the moment of its conception, and yet be hanged four months afterwards for the crime of its mother."

whereas, of course, it is well known that not only is there vitality from the earliest period of conception, but that positive indications of life are given long before the mother feels them.

The remark has been made more than once, and to a certain extent it is doubtless true, that the life enjoyed by the embryo is a peculiar and circumscribed life; and that a wide difference exists between the born and unborn child. Still, allowing this, I am not aware that any physicians or jurists in our country have yet adopted the extreme views of Dr. Jŏrg, who, after tracing the development of the fœtus and showing how closely it is dependent on the mother for existence and growth, states his opinion that this body is merely to be regarded as a higher species of *intestinal worm*, being neither endowed with a human soul nor possessing any claim to human attributes while in the uterus.[1] It is no argument in favor of these and such like conceits to say, that there is no distinct anastomosis between the bloodvessels of the uterine and fœtal portions of the placenta; or that the membranes round the fœtus constitute an essential part of it; or that the rudimentary organs are adapted only to a future use; or lastly, that the fœtus cannot receive mental impressions. The formation and growth of a human being are very gradual processes; embryonic development consisting of a series of stages so closely dovetailed into each other that no two admit of separation. Neither physiological laws nor plain reason enable us to restrict the period at which the embryo acquires life. Hence it is just as absurd to assert that it is less criminal to induce abortion at the twelfth week of intra-uterine life than at the sixteenth, as it is extravagant to maintain that the fœtus is merely a water-worm the day before parturition, only becoming a human being after it has breathed. A fœtus in utero may not be a living infant in the eye of the law, but it is strange to find a man of science upholding so preposterous a doctrine. On the contrary, instead of maintaining such an error, we should all exert ourselves to have the law altered; for the present state of it is practically injurious to society in at least two ways. Thus, in the *first* place, guilty women are frequently acquitted of the crime of infanticide because it cannot be proved that the child was alive and wholly

[1] Die Zurechnungsfähigkeit der Schwangern und Gebärenden beleuchtet. By Dr J. C. G. Jŏrg, Professor of Midwifery in the University of Leipzig. Pp. 146 and 148. Leipzig, 1837.

born when the fatal violence was inflicted. In the pages of the *Provincial Medical and Surgical Journal* for 23d April, 1845, a case is reported, in which it was proved that a murdered infant had breathed; though, when found, the child's head was nearly severed from its body. Mr. Justice Erle directed the jury, that before they returned a verdict of guilty they ought to be satisfied that the child had an existence distinct from, and independent of, the mother, when she murdered it. As this point could not possibly be proved, of course the prisoner was acquitted. Then *secondly*, a married woman far advanced in pregnancy may die, a live child being in utero. Supposing a medical man to be present, he might be able to save the infant's life by performing the Cæsarean section: yet he cannot safely do so without the consent of the husband. The late Dr. Lever met with two cases, in both of which the women died in the eighth month of pregnancy. The children were both alive immediately after the death of the mothers: nevertheless, the father in each instance refused to allow the live infant to be removed from the uterus of the dead mother. Legally, the conduct of these men was justifiable; morally, they would certainly appear to have been guilty of homicide. A child in its mother's womb, not being a living child in law, its extraction must be quite unnecessary. Yet this is hardly the view we can take as physiologists. And it might be thought that even an ordinary legislator would hold, that a living child, an hour before its birth, had as much right to receive protection and aid from the laws of society as one just born.

Although quickening is usually ascribed to the first movements of the child which are felt by the mother, yet some authorities deny this; agreeing with the suggestion of Burns, that it may be produced by the sudden rising of the uterus out of the true into the false pelvis. When we find the cause of such a familiar occurrence the subject of dispute, it would appear not only possible but probable, that the effect may result from different conditions. Dr. Evory Kennedy believes that this is the case. Hence he very wisely advises us not to agree with such as assert that quickening is solely attributable to the sudden change in position of the uterus, nor with those who would make it appear to be invariably due to the first sensation which the mother has of the motion of the child; but rather to define it as a sense of the first perceptible motion in the uterine region about the sixteenth week

after impregnation, having for its cause either change of position of the uterus or the movements of the fœtus. Women who think themselves pregnant usually look forward to quickening as the event which is to confirm their hopes. They describe the sensation which is produced as a peculiar flutter, or thrill, or slight tapping movement, or pulsation in the uterine region; which is followed or accompanied by a sense of nausea, a disposition to fainting or to a fit of hysteria, and a feeling of fear or general depression. Not unfrequently after quickening has occurred, the morning sickness, as well as many of those other sympathetic affections which have annoyed the pregnant female during the early months of gestation, subside; so that better health is enjoyed than has been experienced for several previous weeks.

The period at which the movements of the child are first felt by the mother is not only somewhat uncertain, but, in a few instances, where healthy children are subsequently brought forth, they are not experienced at all during the whole term of gestation. As a rule, however, the time may be said to vary between the end of the twelfth and sixteenth weeks from the day of conception; the movements becoming stronger and more perceptible as gestation advances. Thus, the motions which at first merely resembled a slight flutter, or creeping, can afterwards be classified into two divisions. In the one case, they consist of a general quivering, sensible to the mother, and probably due to a change in position of the fœtus; while, in the second instance, they are compared to short blows or knocks, and are produced by the abrupt actions of the legs or arms of the child. The educated hand of the practitioner laid flat upon the patient's abdomen can, as a rule, readily detect these movements; which may also be generally excited by practising palpation on the side of the abdomen opposite to the examiner's hand. Some obstetricians advise that the hand should be dipped in very cold water and then suddenly laid upon the abdomen, so as to aggravate these movements when they are feeble. There are, however, serious objections to this proceeding. I would especially mention, that the cold diminishes the acuteness of the sense of touch; while it is very likely to induce spasmodic contractions of portions of the recti muscles, which are almost certain to be mistaken for fœtal movements. When the movements which have been active all at once become feeble and indistinct, without any appreciable cause, we may reasonably fear

that the fœtal health is suffering; and care should be taken to improve it by attending to the condition of the mother, and removing any local congestion, &c. When the pregnancy is complicated with ascites, the movements appear indistinct to the mother in proportion as the fluid increases in the peritoneum, and so separates the anterior wall of the uterus from the abdominal parietes. This fact has led to the supposition that it is the wall of the abdomen, and not that of the uterus, which perceives the impulse.

Finally, the student must not imagine that no mistake can be made with regard to these movements. On the contrary, not only is it possible for a woman who is not pregnant to persuade herself that she feels the motions of the child, but occasionally she may lead even medical men to believe that they also detect them. It is related of our first Queen Mary, of inglorious memory, that being very anxious to have issue, she fondly gave credit to any appearance of pregnancy; and at one time fancied she felt "the embryo stir in her womb." Despatches were immediately sent to inform foreign courts of this event, while orders were issued to give public thanks. It was determined that the child must necessarily be a male; and Bonner, Bishop of London, directed public prayers to be offered that heaven would please to render the prince beautiful and vigorous and healthy. The result proved that the queen's sensations were due to the commencement of a dropsy.[1] Without a doubt it seems strange that a woman should make such a mistake, especially if she has previously had children; but it cannot be denied that the pulsation of the aorta in dyspepsia, or the rapid movement of air in the intestines, or some spasmodic action in the uterus, will so simulate quickening—particularly when aided by a vivid imagination—as occasionally to deceive the most experienced and intelligent.

[1] Refer to The History of England, by David Hume. Vol. iii, p. 348. New edition, London, 1841. Also, Lives of the Queens of England, by Agnes Strickland. London, 1851. This author, speaking of Mary's deplorable state of health from dropsy, says (vol. iii, p. 550): "The females of her household and her medical attendants still kept up the delusive hope that her accouchement was at hand. Prayers were put up for her safe delivery in May, 1555; and circulars were written, similar to those prepared at the birth of Queen Elizabeth and Edward the Sixth, in which blanks were left for dates, and for the sex of the royal offspring. The news was actually published in London, and carried to Norwich and Flanders, that a prince was born."

Section 7.—Changes in the Uterus.

To appreciate thoroughly the changes which take place in the uterus after conception, as well as to comprehend the nature of some of the diseases that occur during pregnancy, it is necessary to have a distinct idea of the form and structure of this organ in its unimpregnated state. Hence, the leading features in the anatomy of the womb may be first treated of with advantage, before speaking of the effects of impregnation.

The virgin, or unimpregnated, or nulliparous uterus, is a slightly-flattened and pyriform-shaped and hollow organ; the fundus being nearly flat or very slightly convex, the anterior surface of the body smooth and rather convex, the posterior surface more convex and sometimes presenting a ridge or prominence along the median line, while the cervix is a smooth and firm truncated cone. The thick muscular walls are so nearly in apposition, that they leave only a small intermediate space called the cavity of the uterus. The weight of the womb is from one ounce to an ounce and a half; and it measures about two inches and three-quarters in length, two inches in breadth at the widest part, and rather more than an inch in thickness. The multiparous organ is in every respect rather larger and heavier, the fundus is more arched and expanded, and the cervix is of greater size and flaccid.

The uterus is situated in the true pelvis between the bladder and rectum, being loosely retained in position by the round and broad ligaments on each side, as well as by the vagina and fibres of connective tissue. It is artificially divided by anatomists into the fundus, body, and cervix. The fundus or upper third is covered entirely by the peritoneum, the body being only partially so. At the points of union between the sides of the fundus with the body are two projecting angles, to which the Fallopian tubes are attached, and from whence pass off duplicatures of the peritoneum forming the broad ligaments. The cervix, or neck, or lower third of the uterus, is embraced by the upper end of the vagina, into which the uterine cavity opens. This aperture is known as the os uteri. The os uteri—transverse in the virgin, irregularly round and puckered in the multipara—is bounded by two thick lips, an anterior and a posterior;

the latter being the thinnest and rather the longest of the two, although from the position of the uterus in the pelvis the reverse seems to be the case. The epithelium of the mucous coat covering the lips and vaginal portion of the cervix uteri is of the tessellated or squamous variety; and beneath this epithelium are numerous vascular papillæ or villi.

On carefully dissecting this organ—so justly spoken of by Swammerdam as the *miraculum naturæ*—its walls will be found to consist of three layers; which, however, are so blended together that no actual line of demarcation can be seen, even by the microscope, to exist between them. First, we find the thin peritoneal or serous coat forming an external investment to the body and fundus. Secondly, there is the proper substance of the uterus—the thick muscular structure—composed of pale and unstriped muscular fibres, interlacing in all directions; these fibres forming, with a homogeneous connective tissue, longitudinal and transverse, oblique, and circular and transverse layers. The external stratum of longitudinal and transverse fibres is thin, the middle layer is strong and thick, whilst the fibres of the internal coat are fine and delicate. Thirdly, we have the vascular mucous membrane lining the cavity of the uterus, and constituting the internal coat of the organ.

The peritoneum is reflected from the posterior surface of the bladder on to the anterior surface of the uterus at about the part where the body joins the cervix; it then ascends over the body and fundus of the organ, and descending down the posterior surface, covers the upper end of the vagina before turning upwards to invest the rectum. At the sides of the superior portion of the uterus, the peritoneum is continued on to the Fallopian tubes, the round ligaments, and the ligaments of the ovaries; the duplicatures between which these appendages of the uterus are contained forming the broad ligaments. During pregnancy, the component elements of the peritoneum increase *pari passu* with the other uterine tissues; so that without becoming attenuated, this serous membrane still invests those parts of the uterus which were covered by it in the non-pregnant condition.

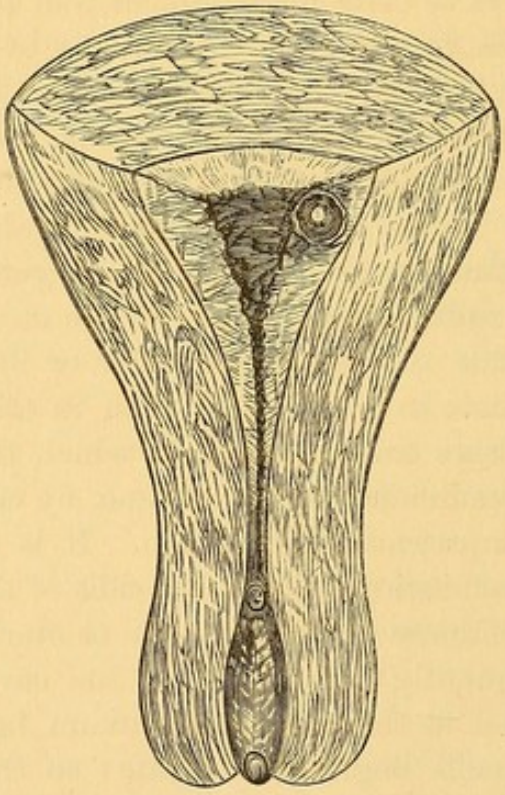
According to the microscopic researches of Kilian and Rainey and others, the substance of the uterus would seem to be made up of fibrous and connective tissue, together with a vast number of muscular fibre cells, fibre germs, or embryonic nucleated

cells, which have the power of development into non-striated involuntary muscular fibres. The diameter of these cells is about the $\frac{1}{4000}$th of an inch, and their length somewhat greater. In the unimpregnated or nulliparous uterus, under ordinary circumstances, the contractile fibre cells or germs remain quiescent; but on the occurrence of impregnation, the growth of a polypus or fibroid tumor, or the continued application of an irritant to the cavity or walls, they commence a career of growth and multiplication. During pregnancy, every muscular fibre cell is said by Kölliker to increase from seven to eleven times in length, and from two to five times in breadth. Each cell is then seen to have a distinct oval nucleus. These fibre cells are of great importance, as it is to their development that the gravid uterus owes its contractile properties. "They may be compared," says Dr. Tyler Smith, "to the derivative germ cells by which lost parts are reproduced in the lower animals, and which, but for the loss which calls forth their development, would forever remain inactive. In the case of the uterus, unless impregnation or some other stimulus be applied, these germ fibres remain through life in a rudimentary state. In the unimpregnated condition it is probable that the germ fibres or fibre cells are in a more advanced state in some uteri than in others, particularly in multipara. Cases are met with in which the uterus expels coagula, or the dysmenorrhœa membrane, by contractile efforts, even in the unimpregnated condition. It is probable, indeed certain, that, by relaxation of the fibre cells of the os and cervix, and contraction of those of the body, the os uteri may be opened, and matters frequently expelled from the cavity of the virgin uterus."[1] As soon as the fecundated ovum has settled in the uterus the fibre cells begin to elongate; so that, as just mentioned, at the time of labor they are very many times longer and wider than before impregnation, while new generations of cells are likewise formed. The development of new cells is most active in the early part of pregnancy, and is supposed to cease at the sixth month. The contractile power of the uterus at the completion of gestation is owing to these colossal muscular fibre cells; this power being retained even for some few hours after death, so that a fœtus may be expelled subsequent to the decease of its mother.

[1] A Manual of Obstetrics, by W. Tyler Smith, M.D., &c., p. 36. London, 1858.

The uterine cavity is about two inches and a half in length; it is of a triangular shape in that part belonging to the fundus; and its narrowest portion is found at the junction of the body with the cervix—a part sometimes spoken of as the os uteri internum. Three apertures open into it: *i. e.*, the two uterine extremities of the Fallopian tubes at the angles formed by the junction of the fundus and body, and the os uteri. The cavity is lined by ciliated mucous membrane, continuous with that lining the Fallopian tubes and the vagina. This membrane is composed of numerous minute follicles, capillaries, epithelium, free nuclei, fibre cells, and amorphous connective tissue. In the body the mucous mem-

FIG. 6.



SECTION OF THE UTERUS ABOUT THE END OF THE FIRST WEEK OF PREGNANCY.

The drawing shows the mucous membrane of the uterine cavity developed into the membrana decidua. The fecundated ovum is seen embedded in the hypertrophied mucous membrane. In the cervix, there are two distended glands filled with mucus; but the mucous lining of this part retains its original condition.

brane is smooth, pale in color, and can be seen by a lens to be dotted throughout with the orifices of numberless simple tubular glands, resembling the follicles of Lieberkühn in the intestine; these glands being about a quarter of an inch in length, being arranged vertically side by side, and probably having for their function—according to Goodsir, Kölliker, Tyler Smith, and

others—the office of elaborating the material out of which the decidua reflexa is formed. The mucous coat of the cervix is marked by four longitudinal ridges, from all of which rugæ are directed obliquely upwards on each side, presenting an appearance which has been named the arbor vitæ uterinus. All parts of these rugæ, as well as the grooves or sulci between the columns, are covered with multitudes of mucous cysts or follicles.[1] The viscid secretion from these follicles is of alkaline reaction; it keeps the cervix uteri moist in the ordinary condition of this part, it forms a kind of mucous plug which is often present, and it serves to freely lubricate the cervix and vagina during labor.

When the ovule has become fertilized, the mucous membrane lining the body of the uterus very quickly takes on a remarkable activity of growth, and becomes much increased in thickness and softness and vascularity. The minute tubular follicles increase in length and width, while the vascular network encircling them gets much developed. The rich and soft and velvety appearance presented by the hypertrophied mucous membrane, may perhaps be imagined from the wood-cut on the preceding page.

Fecundation having been accomplished, the uterine mucous membrane is now spoken of as the decidua vera, or the decidua uteri, and it forms the external envelope of the fœtus. The new structure is the thin decidua reflexa, or decidua ovuli. This is probably produced by the ovum sinking into a depression or follicle of the decidua vera, the walls of which depression become developed around the projecting part of the germ so as to envelop and fix it in position.[2] Thus, in a few days, the ovum

[1] "In a portion of the cervix, comprising only three rugæ and their two interspaces, upwards of five hundred mucous follicles were easily counted, so that it is within the limits of moderation to say that a well-developed virgin cervix uteri must contain at least ten thousand mucous follicles; indeed, even this number is probably greatly exceeded." On the Pathology and Treatment of Leucorrhœa. By W. Tyler Smith, M.D., &c., p. 26. London, 1855.

[2] The mode of formation of the decidua ovuli is still a subject of dispute with physiologists; the difficulty of investigating the question being increased by the circumstance that no such tissue is found in the gravid uteri of the lower animals. The explanation given in the text is, I believe, the one generally received as correct; but Weber has thrown out another suggestion. He believes—to use Dr. Priestley's words—that this membrane "is actually the primary lamina secreted before the ovum enters the uterus, which separates in two-thirds of its extent from the layers immediately beneath it to adhere to the ovum and retain it in position; the remaining third not separating, but remaining as a centre of nutrition by its union with the womb." On this principle the decidua vera must be regarded as a subsequent formation on the uterine walls, or a

gets confined in a distinct cavity of its own. For some time, the membrane reflected over the ovum remains separated from the uterine decidua by a well-marked space containing a little pinkish fluid. But this space gradually diminishes as the embryo increases in length and breadth; until the two membranes are first brought into close contact, and then finally become fused into a single thin and friable structure. The exact period when this takes place is, as before mentioned, unknown; but it is probable that it occurs between the end of the third and seventh months. Thus, the ovum is surrounded in two-thirds of its circumference by the decidua vera and the decidua reflexa; these membranes, coalescing in the remaining third and constituting a thick layer, by which the ovum and the uterus are closely united to each other. It is at this part that the placenta is formed.

While these changes have been progressing, the development of the embryo, as well as of the chorion and amnion, has been advancing. If, now, the decidua reflexa be laid open, the ovum is seen surrounded by its own membranes, viz., first, by the chorion with its villi, and then by the amnion. The villi of the chorion take root, as it were, in the substance of the decidua, and effect the process of imbibition from the maternal capillaries; the internal surface of this tunic being smooth like a serous membrane. If we examine the villi from this internal surface we shall find that they are hollow, like the fingers of a glove. As development proceeds, a little vesicle—the allantois—from the embryo approaches the inner surface of the chorion and spreads over it, the umbilical vessels ramifying upon it. When the surface of this minute sac unites with the chorion, it forms the vascular layer of the latter, or the endo-chorion as it is termed. From this layer, capillary loops are given off which enter the villi; and the latter then become largely developed, forming numberless irregular branches, which ramify and constitute a very intricate network in the decidua. The villi at first branch out from the whole of the external surface of the chorion; but as those imbedded in the reflected decidua get separated from the uterus by the decidual cavity, they become atrophied

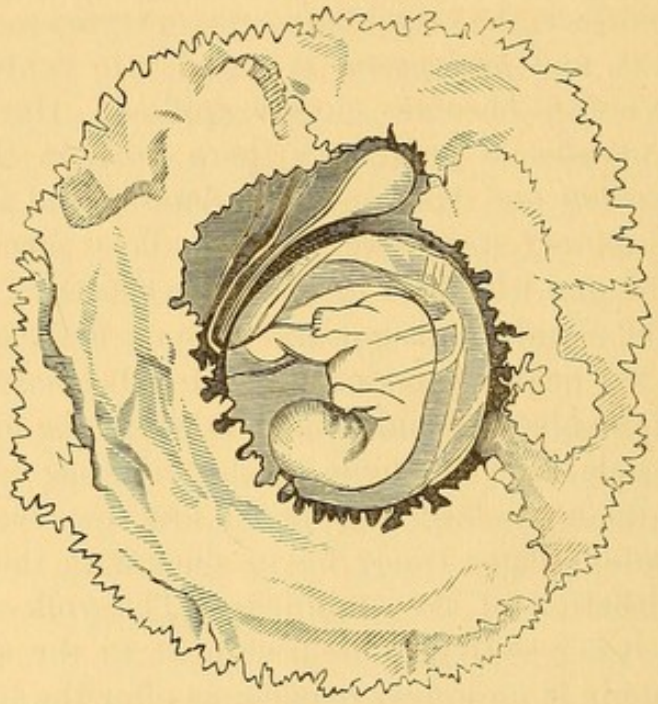
deeper layer, secreted after the manner of the previous growth. Dr. Priestley accepts this view as being probable; and states the reasons which have influenced him, in his valuable work.—Lectures on the Development of the Gravid Uterus. London, 1860.

and disappear. At the same time those branches in contact with the uterine decidua undergo a luxuriant and progressive development to ultimately form the fœtal portion of the placenta. The amnion is a tough transparent membrane, which at first closely surrounds the embryo, and is continuous with the integument of the fœtus at the umbilicus. As the liquor amnii is secreted on its inner surface, the membrane gets separated more and more from the fœtus, and *pari passu*, is urged into contact with the chorion, to which it becomes closely applied. During the first and second months of pregnancy there exist, in the space between the chorion and amnion, the allantoid and the umbilical vesicles,—temporary structures, whose pedicles form part of the umbilical cord, and which are inclosed in a sheath of the amnion. The sac of the allantois disappears within a few days of its formation; but the pedicle remains, ultimately becoming one of the ligaments of the bladder, and being known as the urachus. The umbilical vesicle—the analogue of the yolk-bag in the egg of oviparous animals—is large during the first few weeks of gestation, and communicates freely by its duct with the fœtal intestine at the situation of the umbilicus. The yolk-colored fluid contained in it is a source of nourishment to the embryo; and when this supply is no longer needed, as after the second month when the placenta becomes developed, the vesicle gradually shrivels up. The pedicle receives an artery and vein from the fœtus, called the omphalo-mesenteric vessels; and these disappear as the vesicle gets atrophied.

The uterus is very freely supplied with bloodvessels, receiving the two ovarian or spermatic arteries from the aorta, and the two uterine from the internal iliacs: with nerves from the sacral plexus of the cerebro-spinal system, as well as with a great many branches from the hypogastric plexus of the sympathetic: and with very numerous lymphatics, which run into the pelvic and lumbar glands. During pregnancy the lymphatics, arteries, and veins ramifying through the uterine tissues undergo a very marked increase both in length and breadth; the veins especially becoming broad flattened channels, which anastomose and form large sinuses. The venous canals opposite the placental insertion are larger than elsewhere. The very remarkable dissections of Dr. Robert Lee would serve to show that the uterus is much more abundantly supplied with nerves than has hitherto been allowed,

that these nerves have numerous ganglia connected with them, and that they become much enlarged as gestation progresses. It has, however, been denied that the structures regarded as nerves by Dr. Lee are really such. And although the subject is still

FIG. 7.



A COMPLETE OVUM AT ABOUT THE EIGHTH WEEK.

The drawing shows the chorion, as well as the closed sac of the amnion, containing liquor amnii and the embryo with its short umbilical cord. Between the inner surface of the chorion and the sac of the amnion is the cavity of the allantois filled with fluid. The pear-shaped bag above is the umbilical vesicle; from which the canal (Ductus Vitello-intestinalis) and the mesenteric vessels of the umbilicus (Vasa omphalo-mesaraica) lead into the umbilical cord.

involved in doubt, yet several eminent anatomists seem to think that it is merely the fibrous neurilemma or nerve-sheath which becomes spread out; it being their opinion that no multiplication or increased development of the nerve tubules and ganglionic nerve corpuscles takes place during pregnancy.

In examining those changes which occur in the uterus after conception, and which are appreciable as marks of diagnosis, we have to consider the alterations presented by the os and cervix, as well as those induced in the size and consistence of the whole uterus. On making a vaginal examination in a female who has never been impregnated—sexual intercourse *per se* having no effect upon the uterus—the cervix uteri is found projecting into the vagina to the extent of rather more or less than half an inch; its component structures are firm and consistent to the touch, like

fibrous tissue; there is neither hypertrophy nor congestion; and the os uteri can be felt as a small transverse opening, with well-defined margins. Immediately after conception the tissues of the uterine neck begin to undergo certain alterations; since the cervix participates in that general congestion which the genital organs then experience. Consequent upon these changes, the lips of the os uteri are found, about the end of the first month, to be more swollen and softer than they were previously; though this increased fulness is frequently hardly sufficient to be generally appreciated. As gestation advances, the softening invades the whole cervix, progressing from below upwards. Moreover, all the tissues of this part seem thicker and more elastic than before; while its canal becomes slightly widened, so that each month the finger can be made to penetrate deeper into it. After the eighth month, the textures of the neck are often as soft as those of the vagina; though it must be remembered that this softening is not only slower in primiparæ than in women who have previously had children, but is seldom as strongly marked.

All authors agree that the cervix undergoes no modification in length during the early months of gestation. But only a few years back it was universally taught, that during the fifth month the projection of the cervix into the upper portion of the vagina becomes lessened; the shortening having been said to be due to a gradual drawing up of the supra- and infra-vaginal portion of the cervix, by which the walls of this part get added to those of the body. So important have these views been deemed, that the diagnosis of the different periods of pregnancy has been partly based on this gradual shortening; and even now we find some writers laying down the rule that the neck loses one-third of its length at the fifth month, one-half at the sixth, two-thirds in the seventh, four-fifths in the eighth, and the remainder in the ninth month. In the year 1826, M. Stoltz tried to prove that all this is an entire error; and he attempted to demonstrate that the cervix retains almost its whole length till the last fortnight of pregnancy. Many writers had previously noticed that sometimes the neck did not shorten; but the cases in which this was observed were thought to be exceptional.[1] In 1839, M. Cazeaux advocated

[1] For example, Smellie says: "The neck of the womb will, in some, be felt as long in the eighth, as in others at the sixth or seventh month."—The Theory and Practice of Midwifery, by W. Smellie, M.D. Fifth Edition, vol. i, p. 188. London, 1766.

the views of Stoltz; but still they were not generally adopted. And although much has been written on this subject during the last twelve or fifteen years, yet in some of the most recent text-books on midwifery the occurrence of this change is insisted upon; the authors giving very exact diagrams, probably drawn from the imagination, illustrative of its gradual progress. M. Cazeaux's opinion seems to have been that the cervix undergoes, during pregnancy, at least in primiparæ, a decided *though slight* diminution of length; and that this diminution is produced, not by the enlargement and distension of the cervical cavity from above downwards, but by the approximation to one another of its two extremities, the cavity becoming more markedly fusiform, and filled with its ordinary mucous secretion. Now these observations appear to have stimulated Dr. J. Matthews Duncan to investigate the subject anew; and he says positively that the length of the cavity of the cervix undergoes little or no change during pregnancy, and certainly no change which can be measured or appreciated during life.[1] He founds this opinion on the results of numerous vaginal examinations; but chiefly on the more close and exact examination of the uteri of women who have died at different stages of utero-gestation. Dr. J. M. Duncan does not allude to the latter days of the ninth month of pregnancy; because it is undoubted that painless contractions are then slowly going on, which of course end in the cervical canal becoming completely obliterated. Without pretending to have made any special observations upon this subject, yet I have for several years taught these doctrines. Shortly recapitulated they are as follows: The cervix uteri does not unfold or lose itself in the walls of the body of the uterus, nor does it get lost or merged into the tissues of the vagina, during gestation. On the contrary, the whole cervix—the supra- and infra-vaginal portion—remains unshortened until the process of parturition commences; when the walls gradually expand and unfold to allow of the exit of the infant. That there is an apparent or simulated shortening, during the latter weeks of gestation, is not denied; a condition which is due to the increased softening and greater breadth of the cervix, consequent upon that hypertrophy of the connective tissue which results from pregnancy.

[1] On the Cervix Uteri in Pregnancy,—Edinburgh Medical Journal, p. 773. March, 1859.

The body of the uterus becomes enlarged from many other causes besides pregnancy. And yet the increase in size which commences directly the commingling of the sperm-cell and germ-cell have given origin to the embryo, and which gradually but steadily progresses, will frequently enable us to diagnose the existence of pregnancy at an early period,—as early as the seventh or eighth week. Suppose, for example, that on making a careful vaginal examination, passing the finger well up between the uterus and the empty bladder, the former organ be found enlarged. The question of course arises as to the cause of this enlargement. Now, in the first place, the amplification produced by early gestation is peculiar. There is a more sodden feeling communicated to the touch than is given by any tumor, or by a syphilitic or tubercular or cancerous infiltration. Then, considerable light may be thrown on the nature of this enlargement, if we can connect it with another symptom. Thus should it appear that two monthly periods have been passed over without any appearance of the catamenia, it may be fairly assumed that neither a fibroid tumor, nor any polypoid growth, nor any cancerous infiltration, can be present; since in these diseases there is a strong tendency to an excessive flow, rather than to any suppression. So again, if the os uteri appear healthy, and especially if menstruation have been previously regular, there can be no reason for supposing that menstrual blood or serous fluid has been retained in the uterine cavity. Simple congestion and hypertrophy will not account for the enlargement, inasmuch as in such a case there will not only be more or less menorrhagia but also uterine leucorrhœa. Moreover, the menses cannot be suppressed from constitutional disease —such as tuberculosis—without there being other evidences of this affection; while in such cases there is no uterine enlargement. Obviously then, by excluding all these possible causes, the conclusion becomes justifiable that the enlargement is in all probability due to the presence of a fœtus.

The development of the body of the uterus which results from pregnancy, takes place whether the impregnated ovum arrives in the uterine cavity or not; though it does not occur in equal degrees in the two cases. Dr. Arthur Farre, in his elaborate essay on "The Uterus and its Appendages,"[1] states that in the

[1] Cyclopædia of Anatomy and Physiology. Supplementary volume, p. 645. London, 1858.

case of extra-uterine pregnancy, a considerable thickening of the uterine substance usually results, together with a general enlargement of the entire organ; this enlargement being equal to that which is observed in the third month, and in some cases —when gestation is not interrupted—even in the fourth month of ordinary pregnancy. Where gestation follows its normal course, the uterus is found at the full period to have increased about twenty-four times in weight, and rather more than five times in length. The rate at which the womb amplifies is liable to some variety, owing to differences in the size of the fœtus, the number of ova impregnated, the quantity of liquor amnii, &c. Making certain allowances, however, it may be laid down as a general rule that the rate of increase, expressed in calendar months, is as follows:

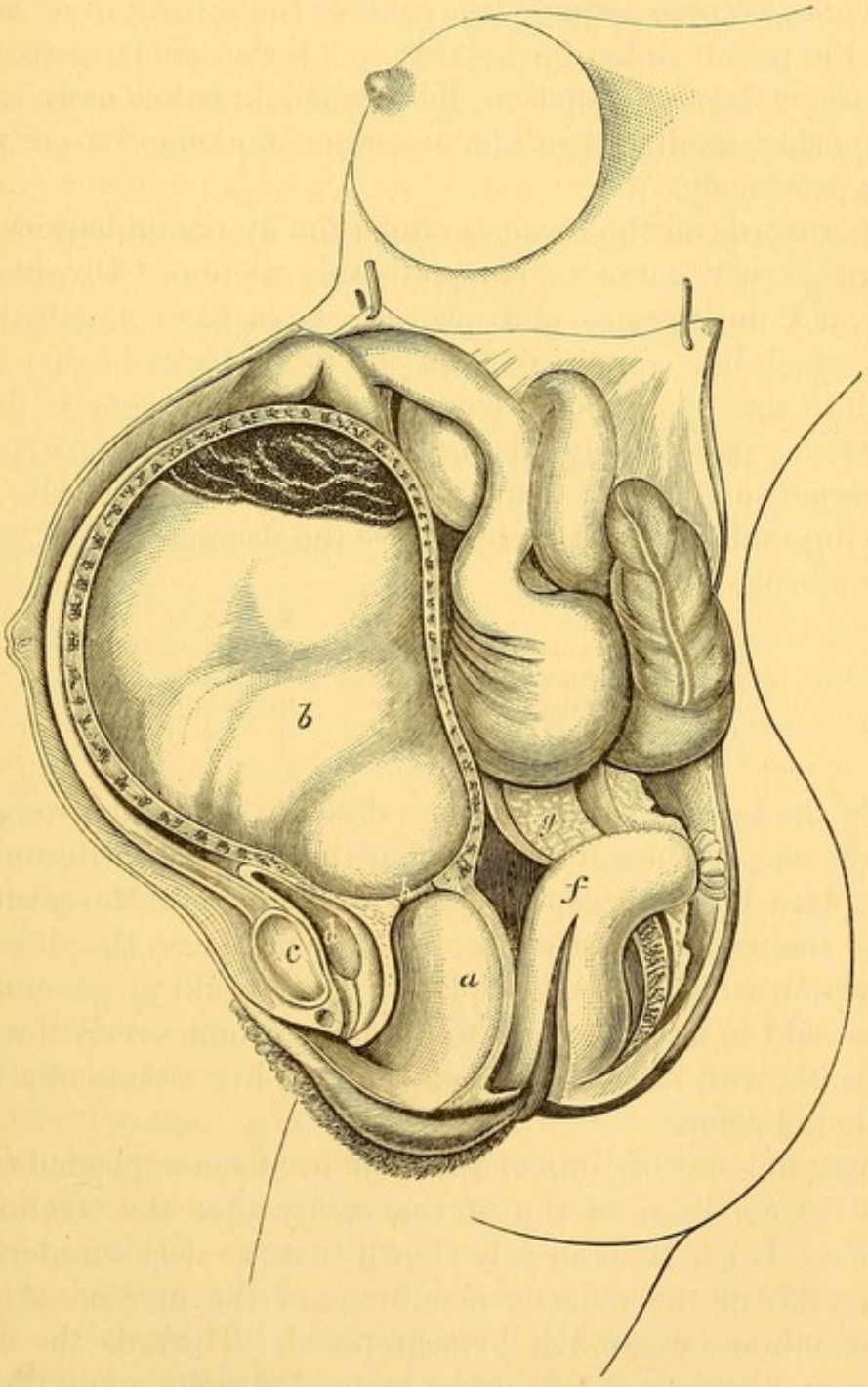
DIMENSIONS OF THE GRAVID UTERUS AT THE CHIEF PERIODS OF PREGNANCY.

Period of Pregnancy.	Length of Uterus.	Breadth.	Antero-Posterior Measurement.
End of 3 months, .	4½ to 5 inches.	4 inches.	3 inches.
" 4 " .	5½ to 6 "	5 "	4 "
" 5 " .	6 to 7 "	5½ "	5 "
" 6 " .	8 to 9 "	6½ "	6 "
" 7 " .	10 to 11 "	7½ "	6½ "
" 8 " .	11 to 12 "	8 "	7 "
" 9 " .	12 to 15 "	9½ "	8 to 9 "

The gradual change in the dimensions of the uterus just described cannot of course occur without this organ also undergoing an alteration in its position. For the first three months of gestation the womb remains in the pelvic excavation, being not only congested and enlarged, but also slightly anteverted. Occasionally, perhaps, as is often stated erroneously to be the rule, there is a mild degree of retroversion. But from numerous examinations I have satisfied myself, that most commonly the os uteri looks towards the sacrum, while the fundus can be felt making slight pressure on the bladder. The uterus then gradually rises out of the cavity of the pelvis, so that about the third month and a half, or at the beginning of the fourth month, the fundus may be felt above the symphysis pubis; while it is at this time that the fœtal movements are usually first appreciable to

the mother. If we trace further the gradual elevation of the fundus we shall find, that during the fifth month it has risen to half way between the symphysis and umbilicus; during the sixth, it has reached as high as the umbilicus; in the seventh, it is

FIG. 8.



THE UTERUS AT THE FULL TERM OF GESTATION. (After Valentin.)

The vagina, *a*; uterus with placenta at upper part, *b*; symphysis pubis, *c*; urinary bladder, *d*; umbilicus, *e*; the rectum, *f*; promontory of sacrum, *g*; and os uteri, *h*.

to be found nearly midway between the umbilicus and ensiform cartilage of the sternum; while by the end of the eighth month it has almost reached the ensiform cartilage, and in another fortnight has quite done so. The uterus, resembling a moderately distended bladder of water, seems now to fill the whole abdomen; the liver being pushed upwards, and the coils of intestines pressed backwards. Three or four days prior to the setting in of actual labor, the womb sinks downwards to a lower level; so that, for the last few days of gestation, the woman breathes more easily, and appears smaller than she has done for some two or three weeks previously.

A few words on the changes which the uterus undergoes after parturition will serve to complete this section. Directly the fœtus and membranes and placenta have been expelled, the organ which has contained them for forty weeks begins to diminish in size by a gradual contraction of its tissues; so that in six or seven days it only fills the pelvic cavity and the hypogastric region, and is not much larger than a cricket-ball. The following table by Dr. Heschl, shows the decrease in the weight of the uterus:

	lb.	oz.	lb.	oz.
Immediately after delivery it weighs	1	6 —	1	8
At the end of the first week "	1	3 —	1	5
At the end of the second "	0	10 —	0	11
At the end of the fifth "	0	5 —	0	6

And in the second month it comes down to its normal weight of $1\frac{1}{2}$ to $2\frac{1}{2}$ oz.; whence it appears that the most rapid diminution takes place in the second week after delivery. Moreover, the size of the womb directly after labor depends on the degree of contraction which has taken place. But speaking generally, it may be said to be from eight to ten inches long, nearly the same in breadth, with its walls an inch thick, and its tissues of a white or pale red color.

A vast amount of time and trouble has been expended to discover the condition of the uterine cavity after the termination of labor. It has been already shown that the decidua uteri consists merely of the mucous membrane of the uterus. At first, this membrane was much hypertrophied. Towards the end of gestation, however, it falls into a state of atrophy, except at that part which has entered into the formation of the placenta. As this outer envelope of the fœtus forms a portion of the secun-

dines, and is consequently expelled after delivery, it has been thought by many physiologists that the inner surface of the uterus must be left entirely denuded. Cruveilhier, indeed, asserts that under these circumstances there is no mucous membrane at all to be found, except just at the inner surface of the cervix uteri; the muscular tissue of the uterus being everywhere exposed. He compares this condition with that of a stump after an amputation, the gaping veins at the site of the placenta being likened to the open-mouthed vessels left by the knife; while he believes that a false membrane, the result of local inflammation, is thrown over the surface prior to the formation of a new mucous coat. More recent researches seem to have shown that this view is incorrect. What really happens is probably this: About one month prior to parturition setting in, an imperfect mucous membrane begins to be developed under the decidua vera; so that after labor, although the muscular fibres are quite exposed at the site of the insertion of the placenta, yet at other parts of the body of the uterus there is a distinct semi-transparent film, which subsequently becomes developed into a perfect mucous membrane.

The atrophy of the proper uterine tissue commences about the fourth or sixth day after labor, and consists in the transformation of the muscular fibres into molecular fat. While this degeneration progresses, the uterus rapidly diminishes in volume and weight. At the end of a week from the expulsion of a full-grown fœtus, the organ is about six inches in length; when a fortnight has elapsed, it is scarcely five inches; while by the completion of the sixth or seventh week it is almost restored to the normal volume of the unimpregnated uterus. The whole process of degeneration and reconstruction is spoken of as the *involution of the uterus.*

While the fatty degeneration of the muscular fibre cells, with the absorption and escape of the oil particles, is steadily progressing, a new series of nucleated fibre cells is developed to take their place; the change being ultimately so complete, that, according to Heschl, not one single fibre of the uterus which existed previous to childbirth remains behind. As the disintegration of the old fibres and the development of the new advance, the uterus loses its reddish color, and becomes very friable as well as of a dirty yellow hue; this latter color slowly disappearing as the new

muscular fibre cells are at first gradually, but at length rapidly, increased in number. It is not until about the end of two months that the reconstruction of all the tissues of the uterus is complete; while sometimes it is much later than this, for the process of involution may be retarded or arrested by puerperal inflammation and other causes. When the involution is quite perfected, the organ which weighed about one pound and a half immediately after delivery, is, as it were, replaced by a new compact structure, usually weighing rather less than 2 oz. and having a cavity only 2½ inches in length. It must not be imagined that the uterus thus formed minutely resembles the womb of the virgin. On the contrary, as has been already mentioned, the body is rather larger, and, so to speak, more clumsy; the os is more patulous and much better defined; while the lips are more fully developed, and frequently have their edges notched or fissured. If, with respect to the reproduction of these imperfections, the question *Cui bono?* be asked, it cannot be answered. Notwithstanding, however, that the reason for all this does not at present admit of explanation, yet that it is so may be readily understood. It is only necessary to remember, that although the component structures of the skin—to take a familiar example—are undergoing a constant process of growth and decay, of degeneration and renewal, yet moles and cicatrices and other abnormal marks are all reproduced, time after time, with the most accurate precision.

Section 8.—Ballottement, or Repercussion.

Ballottement (*Ballotter*, to toss; as to toss a ball at tennis), or repercussion, is a valuable means of acquiring information as to the existence of pregnancy, being less liable to deception than many of the other signs. It depends for its production upon the tilting of the fœtus, whether alive or dead, upwards in the liquor amnii in which it floats; the force being communicated in such a manner, that the child descends upon the finger which dislodged it with a slight impulse.

There are three ways of practising ballottement. The *first*, or external method, is performed by placing the patient on her side, on the extreme edge of the bed, with the abdomen projecting

over it. One open hand is then laid flat on the under surface of the abdomen, and the other on the upper side to insure steadiness; when by making a sudden impulse with the lower hand, the fœtus will be propelled to the opposite side of the bag of the amnion, and will afterwards rebound on the spot from which it was projected. The *second* external plan—hypogastric repercussion as it has been termed—consists in placing the woman on her knees with the shoulders depressed, or on her side with the hips well raised. The fœtus will consequently gravitate towards the fundus uteri, which is in contact with the abdominal parietes; and by then making a jerking pressure as before, the same result will be obtained. The *third*, or internal method, is the best; and it should generally be resorted to when there is no objection to instituting a vaginal exploration. The patient may be examined in the upright position, if necessary; though obviously it will be better for her to be in bed, reclining upon her side with the shoulders much elevated. Whichever position is adopted, the bladder and rectum should both be empty, so as to afford as much space as possible. The first two fingers of either hand are then to be freely oiled and introduced into the vagina and carried upwards, as far as they can be made to extend, to that thin portion of the body of the uterus situated between the cervix and posterior wall of the bladder. Meanwhile the disengaged hand is to make steady pressure downwards upon the abdomen, the woman being directed at the same time to draw a deep inspiration. The examiner taking advantage of the temporary depression of the uterus, makes a quick jerking movement upwards, and forwards, with the fingers in the vagina; by which movement he will receive the impression as of a slight body bounding away, which in a few seconds falls again on the tips of the fingers that have been kept in contact with the uterus.

Most writers state that the discovery of this sign affords a positive proof of the presence of a fœtus in the uterus. Such a proposition is rather too absolute. For example, it is doubtless possible that a stone resting in the bas-fond of a distended bladder might lead to an error. The same mistake would perhaps happen in ovarian dropsy, should there exist a small pedunculated tumor within a larger cyst. So, also, a somewhat hypertrophied and indurated ovary, coexistent with ascites, has produced a movable tumor which has caused an impulse very like that con-

veyed in pregnancy by the motion of the fœtus in the liquor amnii. M. Cazeaux relates that he once met with a case in which the fundus of an anteverted uterus very nearly misled him. He says,—

"During the time I acted at the Obstetrical Clinic as chef de clinique, a woman was subjected to the touch, who declared herself pregnant and advanced to the third or fourth month. At first I examined her in the recumbent position, and found all the negative signs of gestation; but one of my advanced pupils then performed the same manipulation in the standing posture, and declared that he perceived the ballottement. When I re-examined her, I found the following condition of things; the neck was strongly pushed backwards, and a little to the left, it was slightly softened, and sufficiently patulous to admit the extremity of the finger. (This woman acknowledged she had been delivered only four months, previously.) As the finger left the cervix and advanced just behind the symphysis pubis, it encountered a large resisting surface, which was evidently the body of the organ; and then by given a slight blow, a movable body was felt there, which immediately fell back upon the finger, exactly as the fœtus would in the fourth month. I confess that at first I thought her enceinte; but retouching her in the recumbent state, I once more remarked the negative signs, though my finger could not now detect the substance which had been so easily moved when she was standing. At the third examination I discovered an anteversion of the womb, so complete that its anterior face had become inferior or horizontal, and it was over nearly the whole extent of this face the finger had passed in examining; and further, I found that the fundus uteri, situated behind the symphysis pubis, was the light movable body which had produced the sensation of ballottement."[1]

The incapability of producing ballottement must not be taken as a decisive proof that pregnancy does not exist; since many circumstances may prevent even a careful examiner from detecting it. Malposition of the fœtus renders its appreciation difficult: in foot or breech presentations, the soft tissues greatly impede the rebound from being felt, while in transverse presentations it is generally impossible to obtain it at all. Presentation of the placenta may hinder its detection; for the fœtus must of course rebound on this organ, the thickness and softness of which is very likely to prevent any impulse being communicated to the finger.

Repercussion can usually be practised with the greatest hope of success, from the end of the fourth month of pregnancy to about the termination of the seventh. At an earlier period than

[1] A Theoretical and Practical Treatise on Midwifery, &c. Second American, translated from the Fifth French Edition, by W. R. Bullock, M.D., p. 150. Philadelphia, 1857.

the fourth month, the embryo is too small and light to be distinctly felt. After the end of the seventh month, the fœtus is usually too bulky to move or float freely; while the liquor amnii is then also relatively less in quantity.

In the exploration of the vulva and vagina and cervix uteri by the touch, the physician should accustom himself to use the fingers of either hand; for without going so far as to assert that a good obstetrician must necessarily be ambidextrous, it is still certain that he will find it very advantageous to be so. This will be especially the case in certain displacements of the gravid uterus, when the right and left hands may have to be alternately employed to make a positive diagnosis; as well as when the accoucheur is incapacitated from using one hand by a wound, whitlow, &c. It occasionally becomes necessary to learn the condition of the uterus by instituting an examination per anum; a proceeding, however, which is only to be resorted to when absolutely necessary, since it shocks the sense of decency in most women. In practising it, the patient ought generally to be placed upon her left side; while the examiner should carefully introduce the index or second finger of his left hand, so that its sensitive pulpy extremity may be applied to the back of the uterus. The chief conditions which render an examination by the rectum advisable are as follows: (1) The hymen being intact it is not only difficult to practise the vaginal touch, but we ought to avoid rupturing this membrane, because the suspicion of pregnancy may be unfounded. (2) The existence of a tumor in the recto-vaginal septum will possibly render the ordinary examination almost useless. (3) The increased bulk of the uterus during the first two months of gestation can be more easily detected per rectum than per vaginam; a fact to be recollected when it becomes desirable to ascertain very accurately the extent of this enlargement. And (4) it may be demanded by the existence of extreme sensibility of the vagina, or by the union of the sides of this canal owing to abnormal adhesions, or by the presence—imaginary or real—of some malformation.

Section 9.—Signs derived from Auscultation.

A very great advance was made in the value of the diagnostic signs of pregnancy, when M. Maior—an eminent surgeon of

Geneva—announced his discovery of the sounds of the fœtal heart by the aid of auscultation. This happened towards the end of the year 1818. But owing either to this gentleman's want of energy, or to his entertaining only a slight conception of the results which his discovery might lead to, he remained content with merely publishing the circumstance that he had heard the fœtal heart's action, by applying his ear to the abdomen of a woman far advanced in pregnancy; while he left to others the task of prosecuting the inquiry further, and establishing the results. Hence, little attention was paid to the subject until some four years later, when Dr. Lejumeau de Kergaradec gave to the world his systematic treatise; in which he not only proved that the fœtal heart-beats could be detected at a much earlier period than M. Maior had suspected, but also pointed out a new and important sound—the uterine souffle.[1] No further progress was made for some few years. Then, in 1833, Dr. Evory Kennedy drew attention to the sounds heard in advanced pregnancy in the arteries of the umbilical cord; which were described by him as the funic pulsation and the funic souffle.[2] Again an interval elapsed, though a short one, before Dr. H. F. Naegele proved that the noise produced by the plunging movements of the fœtal limbs in utero may be heard as gentle taps repeated at intervals, at an earlier period than they can be detected by the hand of the practitioner applied over the mother's abdomen.[3]

In considering separately these phenomena, the order in which they have just been mentioned will be reversed; so that the most important may be the last treated of.[4] Before entering upon this task, a few words will suffice to show the best mode of practising obstetric auscultation. As in other branches of medicine so in this, a certain amount of knowledge and tact is necessary to detect the various grades of the phenomena presented, and to ap-

[1] Mémoire sur l'Auscultation appliquée à l'Etude de la Grossesse. Paris, 1822.

[2] Observations on Obstetrical Auscultation, with an Analysis of the Evidences of Pregnancy, &c. Dublin, 1833.

[3] Die Geburtshülfliche Auscultation, p. 62. Mayence, 1838. Or Dr. West's translation, Obstetric Auscultation, p. 50. London, 1839.

[4] There are two other sounds which the stethoscope, applied to the abdomen of a pregnant woman, may at particular periods detect; but a discussion as to their utility does not fall within the scope of this volume. The first is a supposed murmur, like the sound of fermentation, which is *said* by M. Stoltz, of Strasburg, to accompany the decomposition of the liquor amnii and fœtal fluids. The second is a crackling noise, imitated by drawing the nail over a rush-bottomed chair, asserted by M. Caillant to be caused by the separation of the placenta.

preciate their value. And even after a familiarity with the different fœtal and maternal sounds has been acquired by painstaking study, it must be still remembered that a well-schooled ear, with steady attention and great patience, will be found requisite in the examination of the majority of cases. There are very few, if any, occasions, on which mediate auscultation will not prove very preferable to immediate; for, independently of utility and convenience, it is obviously better to apply the stethoscope to the patient's abdomen than the naked ear. Some writers assert that the phenomena are best heard early in the morning, when the patient is fasting, and when the bowels and bladder have been emptied. Where the practitioner has confidence in his sense of hearing, however, he need not wait for any special time of the day; taking care rather to seize the opportunity as it presents itself. The patient should be placed on a couch of a convenient height, upon her back, and with the head raised by a pillow; the limbs being moderately flexed, so as to relax the abdominal muscles. If the abdomen be covered, it should only be with a thin chemise. Care must be taken, too, that there is no retention of urine. Supposing the physician fails in detecting the evidence sought for, he must not rest satisfied with this kind of negative testimony; since many impediments to his success may be present. The chief of these obstacles are,—too early a period of gestation; great feebleness or death of the fœtus; the maternal integuments being loaded with fat; the complication of loud noises made by the intestinal gases; and distension of the abdomen from dropsy, or from some tumor, coexisting with pregnancy. On ausculting the abdomen of a healthy woman who is not pregnant, whether at a catamenial period or not, borborygmi and other noises due to the movement of flatus in the intestines, will be heard; together, generally, with the pulsations of the abdominal aorta.

The observation has been already made that the fœtal movements are generally first felt by the mother about the sixteenth week after the fruitful coition. Dr. H. F. Naegele has shown that very frequently the friction produced by these movements may be heard a few weeks earlier than this time; when the fœtus is very small in proportion to the size of the cavity containing it, and when, therefore, the free movements of the limbs are unrestrained.

The sounds are perceptible as gentle taps, repeated at intervals; sometimes being continued so regularly, that an unpractised auscultator might mistake them for the beatings of the fœtal heart. As pregnancy advances, and as the quantity of liquor amnii becomes proportionately diminished, these motions are rendered more and more indistinct; so that at the end of gestation they can scarcely be detected.

The umbilical cord in the human subject consists essentially of one large vein, and two smaller arteries coiling around it; these being bound together by a quantity of connective tissue, with cells containing much gelatinous matter. The gelatinous material varies in quantity in different embryos: it gives thickness to the cord, and likwise serves to protect the vessels from the injurious effects of pressure. The funis is also covered by a layer of chorion, and externally by a reflexion of the amnion. The purified blood for the nutrition of the fœtus is conveyed from the placenta to the fœtus by the umbilical vein, which enters the abdomen at the umbilicus, passes upwards to the under surface of the liver, and at the transverse fissure divides into two branches. The larger of these branches joins the portal vein; while the smaller —under the name of the ductus venosus—unites with the inferior vena cava. The venous blood is returned to the placenta by the two umbilical arteries, which are the continuations of the fœtal internal iliac arteries. At the time of labor, the funis is generally about twenty or twenty-four inches in length; but it has been found as short as five or six inches, and as long as six feet..

Now, according to the observations of Dr. Kennedy, the pulsations in the umbilical arteries can—in certain positions of the funis—be distinctly heard by the stethoscope; the beats corresponding to those of the fœtal heart, and existing so long as the circulation of the fœtus in utero continues. The funic pulsations are particularly observable when a portion of the cord intervenes between some prominent part of the child's body and the anterior wall of the uterus; though unless the abdominal integuments of the mother are also rather delicate, the sounds will be detected with difficulty. The funis also presents another phenomenon, viz., a souffle, or murmur; which is weaker than the uterine souffle, has a shorter and less hissing sound, and corresponds in frequency with the action of the child's heart. This funic souffle

is said to be due to the transmission of the blood through a part of the umbilical arteries where a narrowing of their calibre exists. Such a diminution in size can readily be produced either by the compression of a fœtal limb, or by a knotting of the funis, or by the winding of the cord round the neck of the fœtus, or even by the moderate pressure of the stethoscope.

These phenomena, it must be confessed, do not possess much practical value. Two circumstances account for this. In the first place, it will at least be very difficult to detect either the pulsations or the murmur, unless the abdominal parietes and the uterine wall are so thin that the funis and fœtal limbs can be distinguished by the touch. And secondly, these sounds are only to be heard at the latter part of pregnancy, when we can resort to other and more useful sources of information.

The uterine souffle—or placental murmur, as M. Kergaradec termed it—is usually audible a few weeks earlier than the fœtal heart. It consists of a single and intermitting and hissing or blowing sound, without impulse or pulsation, and is synchronous with the mother's pulse. The murmur has been compared to a prolonged whispered "who," or to the sound emitted by blowing a pair of bellows; occasionally it is brief, like an abrupt whiff with each pulsation of the mother's heart; while sometimes it assumes all the variations in tone of the *bruit de soufflet* of the heart, such as a whistling, roaring, cooing, or sawing sound. Moreover, firm pressure with the stethoscope will frequently obliterate it.

The question as to the seat of this murmur has given rise to some controversy. At one time, it was the current belief that it existed in the utero-placental circulation; and hence it became designated the placental murmur. Then many auscultators assigned its seat to the large arteries—the aorta and iliac—at the back of the abdomen, considering it as produced by the pressure of the gravid uterus. They named it, therefore, the abdominal murmur. M. Cazeaux has suggested that it is due to pressure on the iliac vessels, conjoined with the existence of an altered condition of the blood. But the most plausible view is that which regards it as originating in the arterial vessels ramifying through the uterine tissues; whence it appears to be very properly designated the uterine souffle, or murmur. The fact that it may

generally be most distinctly heard over that portion of the uterus which corresponds with the insertion of the placenta, is by no means surprising; since we should naturally expect to find it most audible at the part where the development of the uterine vascular system is the most considerable. But Hohl's assertion, that it is to be heard *only* over that part, can I think be contradicted by daily observation.

The period at which the uterine souffle may be first distinguished is liable to vary in different cases. Dr. Kennedy states that he has detected it as early as the tenth week; but I cannot recall any instance where I have been equally fortunate, though I have certainly heard it at the end of the twelfth. As a general rule, it will be heard at the third month and a half, or at the beginning of the fourth month, when the fundus uteri is above the pubes. In seeking for it at this early period, the stethoscope should be applied just above the pubes; for the souffle is then diffused over the whole uterus. But at a later date, it will be most commonly detected by placing the stethoscope over either of the lumbar or iliac regions; though it must be remembered that this murmur changes its situation in a remarkable manner, so that no certain rules can be laid down upon this point. Indeed, the space over which it may be heard varies not only in different individuals, but in the same woman on separate days; being sometimes limited to one spot, at other periods existing over a much larger surface, and occasionally being found—even at an advanced period of gestation—over the whole of the anterior wall of the uterus.[1] Moreover, in the course of a few hours, its seat will fluctuate; so that, in the afternoon, it may be distinctly audible over a spot where it could not be heard in the morning. It is not improbable that it might be detected at an earlier period than ordinarily by means of M. Nauche's metroscope; but the necessity of introducing one extremity of this instrument into the vagina is an insuperable objection to its general employment. The same remark applies to the uterine stethoscope constructed by Dr. Keiller. The end of this instrument is introduced into

[1] Dr. Depaul states that in 295 cases (282?) where gestation had exceeded the fifth month it was heard distinctly on both sides in 182; on one side only, in 27; towards the fundus alone, in 43; in 18 the stethoscope could not be placed over any portion of the uterus without detecting it; while in 12 it existed strongly marked in three places, viz., at the fundus, and just above Poupart's ligament on each side.—Traité d'Auscultation Obstetricale, p. 179. Paris, 1847.

the vagina and applied to the uterine wall, not to the os or cervix. In this way it is contended, that the auscultatory signs of pregnancy may be detected at a much earlier period than by auscultating the uterus through the abdominal walls. The uterine souffle being quite independent of the fœtal circulation, it is not in the least affected by the life or death of the infant; for it may be heard after the expulsion of the child, and even for twenty-four hours after the delivery of the placenta. Where the uterine contractions after labor are very vigorous, however, the sound will usually be found to have ceased.

Too much importance must not be attached to this uterine souffle; for at the best, its presence can only allow us to conclude that pregnancy is probable. I am inclined to think, that as a single sign, it is of most value when heard at an early period of gestation, before much uterine or abdominal enlargement is observable; since it is then less likely to be due to any other condition than pregnancy. I may take, for an example, the following case from my note-book:

In the year 1857, I was consulted by a young unmarried lady for general debility and amenorrhœa. The catamenia had been on for the last time twelve weeks previously. A drop or two of milk could be expressed from the nipples. There was no morning sickness. On a careful examination, no uterine tumor could be detected. By applying the stethoscope just above the pubes, I discovered the uterine souffle very distinctly. Coupling this sign with the absence of abdominal tumor, and the presence of milk in the breasts, little hesitation was felt in stating that she was pregnant. Six months afterwards I delivered her of a live child.

The fact is unfortunate but it is undeniable, that sometimes this murmur cannot be detected, even after many examinations, and yet pregnancy may exist. Instances of this, however, must be rare. On the other hand, I have frequently heard it in large uterine fibroid tumors, and in one instance when the uterus was considerably increased in size from the presence of a vesicular or hydatidiform mole. A few practitioners also state that they have detected it in ovarian dropsy, an observation which I cannot corroborate. The souffle, moreover, when present during pregnancy indicates nothing as to the child's position, nor as to its strength or weakness, nor as to the number of ova which have been fertilized.

The beats of the fœtal heart are to be detected during the last half of intra-uterine life, as distinct rapid sounds, which bear a

close resemblance to the muffled ticking of a watch,—to that of a watch covered with two or three folds of a blanket. The beats, which can frequently be easily reckoned, vary in frequency from 120 to 140, or even 150, in the minute; and each beat or ventricular contraction is accompanied by two sounds. The first sound is weak, short, and obscure: the second is more sonorous and distinct, and is the one which is usually counted, for from their great rapidity it is generally impossible to compute both. The beats bear no relation to the mother's pulse, as regards frequency or force; they are uninfluenced by the uterine contractions; they are only temporarily accelerated by the movements of the fœtus; and the further pregnancy is advanced, and the greater the strength of the fœtus, the more easily will they be detected. A good idea of the nature of the fœtal heart-sounds may be acquired by listening to the chest of the new-born infant. The student will in this way learn that the heart's action is commonly audible over a considerable extent of surface; since it may be heard by applying the stethoscope to any part of the chest, to the arm while pressed against the thorax, and perhaps to the loins. If then he also remembers, that while in utero the solid fœtal lungs act as good conductors of sound, he will see nothing incredible in the statements here made.

Dr. Depaul asserts that he has been able to distinguish the pulsations of the fœtal heart as early as the eleventh week. Very few other practitioners have been equally lucky. I have frequently tried to obtain them about this time by using the double stethoscope, and so placing the woman on her face that the uterus might fall into close apposition with the anterior wall of the abdomen; but the experiment has not been attended with success. In a large lying-in hospital to which Naegele was attached, the eighteenth week of pregnancy was the earliest period at which the sounds could be distinctly heard, while in by far the largest number of cases it was not until the end of the twentieth week. These results agree with those obtained in this country. Hence it may be affirmed, as a general rule, that the sounds of the pulsations cannot be discovered until just about midway between the day of conception and that of labor at the full term.

The double sounds of the fœtal heart will perhaps, in rare cases, be heard over half of the maternal abdomen. Usually they are confined to a spot about two inches in diameter; which

spot—owing to the variety of the positions of the child—may exist over almost any part of the abdominal wall, though at nearly the full term it is most frequently to be found rather below and about two inches to the left of the umbilicus. When the quantity of liquor amnii is small, the fœtal thorax gets pressed into close apposition with the uterine wall, and then the sounds are heard very distinctly, but only over a limited space. On the contrary, if there be an excess of liquor amnii, the extent of surface over which the beats can be distinguished is much increased, whilst their intensity is diminished in a corresponding degree. If we detect the fœtal tictac beating about 130 in the minute, while the maternal pulse is 90 or any number except 130, we may be positive that there is the heart of a live child beneath our stethoscope. Nothing can render such a proof invalid. But if we fail, after a careful and prolonged exploration, to discover the beats, it must not be rashly concluded that the woman is not pregnant. For clearly she can be so, and yet the child may be dead; or, possibly, the sounds are obscured by a very great abundance of liquor amnii; or there may be a fold or two of intestine between the uterus and abdomen, the borborygmi in which mask all other phenomena. M. Stoltz has also stated that these fœtal heart-sounds cannot be heard when the dorsal region is directed backwards, unless some part of the child's thorax be in contact with such a portion of the uterine walls as admits of exploration. As a matter of fact, however, the position of the fœtus is always such, that if it be alive and its development sufficiently advanced, the sounds can almost always be detected. Thus, M. Cazeaux asserts that in examining some seven or eight hundred women, advanced beyond the sixth month, he never failed in hearing the pulsations when the child was alive.[1] Professor Anderson, of Glasgow, in ausculting 180 pregnant women at the full time, only missed in 12 instances to find the sounds of the fœtal heart; and in these 12 cases, and in these only, was the child born dead.[2] Had I kept notes of all the cases in which I have resorted to obstetric auscultation, they would certainly confirm these observations of Cazeaux and Anderson. Only one

[1] A Theoretical and Practical Treatise on Midwifery, &c. Second American, translated from the Fifth French edition, by W. R. Bullock, M. D., p. 153. Philadelphia, 1857.

[2] The London and Edinburgh Monthly Journal of Medical Science, vol. iv, p. 104. London and Edinburgh, 1844.

fallacy can arise with respect to this sign, viz., when the maternal heart is beating with abnormal rapidity, and the aortic pulsations are conveyed to the abdominal walls by some uterine fibroid, or by an ovarian tumor, or by some other growth. Attention to two points will prevent our entertaining an unjust suspicion of pregnancy in such instances. In the first place, we shall find that the pulsations, as well as the sounds of the beats, are uniform over the whole tumor, whatever its size may be; instead of being confined to a small circle, as are the sounds of the fœtal heart. And, secondly, the abdominal beatings will be perfectly synchronous with the pulse at the wrist.

The sign under consideration, moreover, is valuable on many grounds besides its certainty. Thus, it is quite independent of the patient's emotions; it can be sought for without her having any idea of the nature of our suspicions; while if found, it will render a vaginal examination unnecessary. In the diagnosis of twin-pregnancy, the only sign on which any reliance can be placed, is the detection of the distinct pulsations of two fœtal hearts at a distance from each other. Such a diagnosis is free from all chance of error, if the beats vary in frequency in the two situations; or if a spot exists between the two where neither can be distinguished, but from which both can be reached by passing the stethoscope upwards on the one side and downwards on the other. It can readily be understood that in these cases one heart is very generally heard below and to the right or left of the linea alba, while the other is above and on the opposite side.

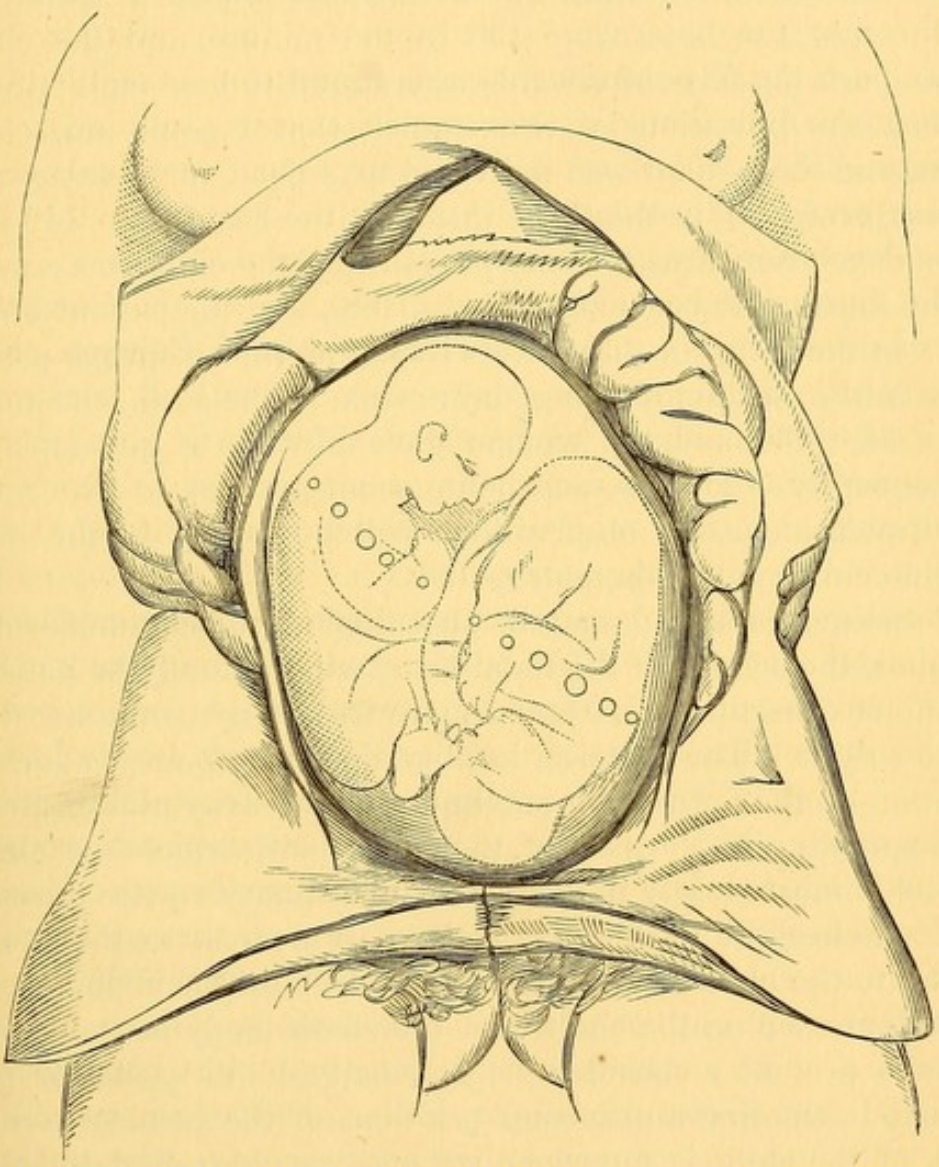
When a woman is pregnant of twins, and one dies at an early period of gestation, the dead child is usually retained until its fellow has arrived at maturity. But it sometimes happens that the dead fœtus is expelled within a few days of its ceasing to live; while the other remains alive in utero until the completion of the full term. Now in such a case, the mother, knowing that she had aborted, would not believe herself pregnant; and consequently might be much alarmed at finding that the catamenia did not reappear, nor her abdomen diminish in size. This anxiety would be at once dispelled by our detecting the fœtal heart, and explaining positively the cause of her condition.

The presence of three distinct double sounds, not isochronous, would warrant the diagnosis of triplets.

The assertion has been made by Dr. Frankenhauser, and has

been reiterated by M. Zepulder (see p. 48), that the mean number of the beats of the fœtal heart, as ascertained by auscultation, are more frequent in female than in male fœtuses. The mean fre-

FIG. 9.



THE ABDOMEN LAID OPEN TO SHOW THE UTERUS, CONTAINING TWINS, AT THE FULL TERM OF PREGNANCY.

The umbilicus of the mother corresponds to a spot about the centre of the uterus. The circles across the fœtal trunks indicate the situations where the sounds of the hearts would be heard: the larger the circle, the more distinct the sounds.

quency of twenty-eight female fœtuses is 144 in the minute, the lowest figure, 138; the mean frequency of twenty-two male fœtuses is 120, the highest figure, 132. By applying this rule, Dr. Frankenhauser has often been able to say correctly, before birth, what was the sex of the child; and, indeed, he seems to

infer that the rule has never failed him, provided it was put to the test before the contractions of the uterus during labor had deranged the natural frequency of the fœtal heart. In order to put this observation to the test of experiment, I carefully examined six women, who were all in the last month of gestation. In the first, the beats were 136 in the minute, and the child, when born ten days afterwards, was found to be a male; in the second, the pulsations were so quick that I could not count them, and the patient was delivered of a dead male fœtus four days afterwards; in the third instance, the beats were 140, and three days afterwards delivery proved that the child was a male; in the fourth, the beats amounted to 140, and the patient bore a girl; in the fifth, the beats were 128, and the offspring proved to be a boy on the following day; while in the sixth, the pulsations were 136, and the woman gave birth to a girl ten days subsequently. These experiments seem at least to prove that Dr. Frankenhauser's observations will not apply to the intra-uterine children of this metropolis.

If the mother's abdomen be ausculted at the commencement of labor, the sounds of the fœtal heart will generally be detected in one or other iliac fossa; and more frequently in the left than in the right. The precise locality depends mainly upon the position of the fœtus; the maximum of intensity almost always corresponding to the part of the uterus with which the child's thorax is most closely in contact. In ordinary vertex presentations the back of the thorax is the part nearest to the uterus, owing to the child's legs being doubled up on the abdomen, the chin depressed on the chest, and the whole body bent forwards so as to present a considerable convexity on its posterior part. Hence, in the first and second positions of the head (where the back of the child is anterior), we may expect to find the fœtal pulsations most audible in the left and right inguinal regions respectively; whilst in the third and fourth positions they should be more posterior towards the woman's loins. In presentations of the face, the front of the chest is the part which lies most contiguous to the uterine parietes; and the situations of the fœtal pulsations have been found to agree therewith, being audible anteriorly (in the iliac region) when the head holds the mento-pubic position, and rather posteriorly when it is in the opposite or mento-sacral position. As regards breech presenta-

tions and footling cases, the fœtal heart is most distinctly heard near the mother's umbilicus. These views were learned long since from an excellent essay which was read before the Dublin Obstetrical Society by Dr. McClintock.[1] The experience which has since been gained has convinced me that they are in the main correct.

The illustrious Harvey speaks of the auricles as the *primum vivens, ultimum moriens;* an expression which might with some license be more justly applied to the whole heart. The moving power of this organ—the life of the flesh—is the blood; and it can hardly be deemed an extravagant conjecture if we suppose that this being to any serious extent diseased, the fœtal heart's action must become appreciably affected. At present, however, we cannot do much to ascertain by means of auscultation the condition of the child's health while in utero; for we really know nothing beyond the simple facts, that excessive frequency of the pulsations, or a diminution in their force, or intermission and irregularity of their rhythm, are so many symptoms betokening feebleness and proportionate danger. When in tedious and difficult labors we find the fœtal pulse becoming slower and slower, we may reasonably infer that undue pressure is being exerted on the funis, thereby causing the aeration of the blood by the placenta to be imperfectly performed. Where, on the contrary, the beats of the heart increase in rapidity, and especially when they likewise become irregular and intermittent, it is probable that the danger does not result from the pressure upon the umbilical cord, but from compression of the brain, or from a source causing cerebral irritation. Under any of these circumstances we have an indication that the child's life is in danger. And hence the labor should if possible be terminated, either by turning or the application of the forceps.

Section 10.—The Minor Signs.

The first of these minor signs which claims some slight attention is derived from the urine. The examination of this secretion during pregnancy, for the detection of some peculiar phenomenon, has long been a favorite practice with physicians;

[1] The Dublin Quarterly Journal of Medical Science, vol. iv, p. 34. Dublin, 1847.

since we find even Hippocrates, Avicenna, Galen, Oribasius, and other ancient authors, noting the changes which they thought were induced. More than three centuries ago, Savonarola wrote, that from the commencement of gestation to the sixth month, more or less, the urine is clear, of a pale lemon color, having a cloudiness on its surface, and a deposit in its centre resembling carded wool; while towards the sixth or seventh month it assumes a turbid appearance with a reddish tinge, the redness becoming more marked as the time of labor approaches. He also warned his readers not to place too much reliance on these appearances; since they are commonly seen in women with simple suppression of the menses, in cases where the uterus contains a mole, and in some instances of gouty or rheumatic inflammation.[1] Although the amount of information contained in these paragraphs could never have proved of much practical utility, yet it may be questioned whether it would be judicious to inquire,—In what respect is our knowledge on this head more valuable now, than it was in the year 1560?

About thirty-six years ago (in 1831) the British and foreign medical journals published accounts of a peculiar product discovered by M. Nauche, and named by him kiestein; which material was supposed to exist only in the urine of women during utero-gestation. This substance becomes visible in the urine of pregnant women, and more exceptionally in that of non-pregnant females suffering from uterine or ovarian disease, when the renal secretion is allowed to repose in a cylindrical glass, protected from the dust. The kiestein begins to make its appearance at a period varying from one day to six or seven, after the urine has been voided; signs of its gradual development being distinguishable, in the majority of cases, before the end of forty-eight hours. At first it appears either as a cotton-like cloud in the centre of the glass, which cloud breaks up and forms a pellicle by its particles rising to the surface; or else as a copious sediment of a whitish color, floating loosely at the bottom of the vessel, particles of which deposit ascend to the surface and form the pellicle, at the end of some hours or days;[2] or again, as a thin trans-

[1] Practica canonica de febribus, pulsibus, urinis, egestionibus, vermibus, et balneis Italiæ, &c. By Joannes Michael Savonarola, p. 685. Lugduni, 1560.

[2] Dr. Stark proposed to designate this substance by the name of gravidine, both from *gravidus*, big with young, and also from *gravis*, heavy, seeing that it falls to the bottom of the vessel; reserving the term kiestein to denote the pellicle which results from the ascent of its particles on the occurrence of decomposition.

parent film on the surface of the urine, which film quickly becomes thicker and more distinct. When perfectly formed, the pellicle somewhat resembles the scum of fat which forms on cold broth; a character it preserves for about three days. It then begins to break up; the urine remaining faintly acid up to this time, and often emitting an unpleasant cheesy odor. The pellicle shortly becomes disintegrated into small flakes; the complete destruction being generally anticipated by the decomposition of the secretion. A pellicle somewhat resembling this of kiestein will frequently form on any specimen of urine, when it becomes decomposed; but it will be evident from the foregoing remarks, that decomposition which produces the one, really destroys the other. On making a microscopic examination of the true pellicle numerous infusoria of the genus Vibrio are seen, and perhaps some flat globules; together with large crystals of ammonio-phosphate of magnesia and amorphous phosphate of lime, as well as minute granules of urates of soda and ammonia.

Dr. Elisha Kane, amongst others, has published the results of numerous observations on this subject. He states, that in eighty-five cases of pregnancy, he obtained a well-marked pellicle in sixty-eight, a modified but recognizable one in eleven, while six afforded no evidence.[1] By many observers kiestein has been found before the end of the second month of pregnancy, and sometimes as early as the beginning of the second week after conception. I have always failed to obtain it when the urine has contained an excess of lithates, even in cases arrived at nearly the full term of gestation. Its presence is supposed to be connected with the lacteal secretion, since when the lacteal elements are secreted with a free discharge at the mammæ carrying them off, it can only rarely be found; but if the escape of the milk be prevented, or if the breasts are very full and turgid, then kiestein can generally be obtained. Dr. Kane remarked that in most instances it continued in the urine for a short time after labor, until the mother began to suckle freely; while of ten women, eight exhibited it at the time of weaning, when the discharge of the milk was of course impeded.

The exact composition of this substance as it exists in newly-passed urine is unknown. According to Dr. J. Braxton Hicks,

[1] The American Journal of Medical Science, vol. xxx, pp. 13 to 38. Philadelphia, 1842.

there can scarcely be any doubt that the action of the air alters kiestein into a substance very similar to casein; for it is coagulable by rennet, is insoluble in cold acetic acid, and generally also in the hot acid. From this gentleman's researches it likewise appears that the addition of about two teaspoonfuls of rennet to some three ounces of the urine of pregnancy, produces the deposit from which the pellicle of kiestein afterwards results more abundantly, and in about half the time required for its formation by simple exposure of the urine to the air. If, when the deposit is well formed, we take about half an ounce of the lower turbid portion of the urine, add a few drops of liquor ammoniæ to it, and boil for a couple of minutes, it will be found that the deposit is formed into a semi-mucous mass, so that the urine becomes almost tremulous. Where this occurs it may be said to be characteristic of the presence of kiestein. This test can be employed equally well without the previous use of rennet. The quantity of phosphates thrown down by the ammonia may be known by gradually adding acetic acid, so as slightly to acidulate: the deposit which remains undissolved being the kiestein.[1]

From the foregoing it will be seen, that taken alone, the existence of kiestein in the urine is by no means sufficiently diagnostic of pregnancy to enable us to form an opinion of any value; but when corroborative of other early signs, it may prove a useful aid in assisting the practitioner to a correct conclusion. The fact is, that although present in pregnancy, yet it may likewise exist in the urine of virgins where there is some irritation of the sexual organs; as well as in that of women with milk in their breasts, the result of a gestation long since completed. It should likewise be borne in mind, that several physicians and chemists deny that the presence of kiestein is of any value even as secondary evidence. Thus, Dr. Veit, who conducted a series of experiments to determine the value to be attached to this product, came to the same conclusion as Höfle and Lehmann, viz., that the so-called pellicle of kiestein is no peculiar matter at all, and is not of the slightest value as a sign of pregnancy.[2]

[1] The rennet is to be thus prepared: Take the fourth stomach of the calf directly it is killed, scour it well inside and out with salt to remove the curd, and let it drain a few hours. Then place it in a jar, and sprinkle a handful of salt on it; shortly afterwards the juice will exude and dissolve the salt, and this is then to be filtered through bibulous paper and bottled for use. Rennet, already salted, may be procured from most butchers. The Lancet, p. 281. 17th September, 1859.

[2] The British and Foreign Medico-Chirurgical Review, vol. viii, p. 551. London, 1851.

More than twenty years since, Mr. Ingleby observed that "in advanced pregnancy the uterus when moderately grasped or rubbed, slightly hardens, independently of actual labor, and almost instantly regains its yielding condition."[1] Dr. Oldham has since pointed out, that this power of contraction possessed by the uterus may be taken as a trustworthy characteristic of pregnancy; for he states that the large gravid uterus alters in a marked manner, under the influence of pressure, from a condition of flaccidity to one of tension. Thus, if we expose a pregnant woman's abdomen, the outline of the tumor is seen to be less defined before manual examination than it becomes afterwards; for on applying the hand, the tumor which at first is felt soft and ill-circumscribed, rapidly assumes a tense rounded form, becoming firm and resisting. Sometimes I have found that mere alteration of position has been sufficient to produce this change; the uterine walls which have been relaxed so that the fœtal parts could be easily distinguished while the patient was lying on her back, becoming tense and hard directly the standing posture was assumed. According to Dr. Oldham, no other tumor but the pregnant uterus possesses this power of altering its form when irritated by palpation:[2] but I must here beg to differ in opinion from this gentleman. Only a short time before the publication of the first edition of this work, in 1860, I was examining the abdomen of a poor woman suffering from an attack of flooding, caused by the presence of a very large polypus in the uterus. The loss of blood had been very great, so that all the tissues were relaxed and flabby; and on placing my hands—which were very cold—over the tumor, I distinctly felt an increased rigidity of the walls of the uterus. And in another instance, where there was considerable development of the uterus owing to the presence in the cavity of a large vesicular mole, the uterine walls became sensibly firmer when pressure was made for a few moments. The truth, indeed, appears to me to be this: That the uterus, in common with other hollow viscera, has, when enlarged through the presence of any substance in its cavity, a regular peristaltic movement, consisting of slight contractions and dilatations. Under the influence of the former the outline of the organ can

[1] Facts and Cases in Obstetric Medicine, &c. By J. D. Ingleby, M.R.C.S., p. 250. London, 1836.

[2] Medical Times and Gazette, 26th January, 1856.

be easily appreciated, other conditions being favorable; and these contractions are undoubtedly the more evident the greater the size of the womb, and the more it is irritated by external manipulation. But as it seems that the peristaltic motions may occur whenever the uterine cavity becomes enlarged from any cause, it necessarily appears objectionable to instance such movements as trustworthy symptoms of the existence of pregnancy.

A discoloration of the vagina, so that the walls of this canal assume a dark violet or dusky hue, has been proposed as a test of pregnancy by Dr. Kluge, of Berlin, and M. Jacquemin, of Paris. The chief facts concerning this change are as follows: It is seldom clearly visible until the end of the third month, though, according to Kluge, it commences in the fourth week. The shade is commonly of a livid purple or port-wine hue, very similar to the tint of the vaginal mucous membrane during menstruation: the color is not always uniformly diffused, but often appears in patches: it can be distinctly seen about the clitoris and urethra, as well as on the inside of the nymphæ, though it is most strongly marked at the upper part of the vagina about the os uteri: it increases from the time of its appearance until the period of delivery, ceasing with the lochia: and it is probably due to a general congestion of the capillaries. The value of this change of color as a sign of fœtation is impaired by the fact, that pregnancy may exist without its occurrence; as well as by the circumstance that the deepened hue is often present at the menstrual periods. Cattle-breeders are so well acquainted with the latter fact, that they learn whether an animal is in heat or not by examining the orifice and inner surface of the vagina, which becomes almost black when the female is in a condition to receive the male. So, again, I have occasionally found it well marked where a fibroid tumor has been of sufficient size to produce congestion of the womb and vagina; in examples of hypertrophy of the uterus, with hæmorrhoids and varicose veins; to a limited extent in cases of vascular tumor of the urethra; in certain forms of hepatic disease; and in dropsy attended with general congestion of the abdominal viscera. Still, if this discoloration be present in a healthy female, in whom the menses have been absent for three or more months, it may be taken as almost decisive of the existence of pregnancy.

An examination of the blood might, in some doubtful cases, assist us in forming our diagnosis; since we know that this fluid undergoes the most remarkable changes almost directly the process of gestation commences. Firstly, the proportion of the globules diminishes at a very early period; this diminution continuing until the hour of delivery. If blood be drawn from a pregnant woman, a buffy coat will be formed, as in cases of inflammation; owing to the rapidity with which the corpuscles run together into piles or rouleaux, and sink below the surface of the liquor sanguinis before the coagulation of the fibrine commences. Secondly, the proportion of albumen is also sensibly diminished, though not to an equal extent with the globules. Thirdly, the fibrine undergoes a marked increase. And fourthly, as the result of the above alterations, there is a diminished density both of the blood and serum. Moreover, if, as occasionally happens, these changes proceed to a great extent, blowing murmurs will be audible on auscultation of the bloodvessels of the neck; while general œdema may result from the infiltration of the connective tissue.[1] Very probably also, in such extreme cases, the urine will be albuminous.

The amount of carbonic acid exhaled from the lungs varies with the age, sex, and state of the system. According to most physiologists the expired air usually contains about four per cent. of its volume of carbonic acid. In the male, there is a progressive increase in the quantity of carbonic acid between the eighth and thirtieth years, a rapid augmentation taking place at puberty: after thirty, there is a gradual decrease. In the female, there is a similar increase from the eighth year until puberty: at which epoch the amount remains stationary, and continues so during the period of sexual activity provided the catamenia occur regularly. During this time, the average exhalation of carbonic acid per hour is 714 cubic inches. At the change of life, the amount exhaled increases to 915 cubic inches per hour; but after the sixtieth year there is a diminution to 793, and later still to 670 cubic inches. During the whole period of pregnancy, the exhalation rises nearly or quite to the amount given off at the change of life, viz., to between 885 and 915 cubic inches per hour. When

[1] Pathological Chemistry, in its application to the Practice of Medicine. Translated from the French of MM. Becquerel and Rodier, by S. T. Speer, M.D., p. 96. London, 1857.

menstruation has been again established, there is a fall to about 714 cubic inches per hour.

A knowledge of the value of frequent observations on the temperature of the body in the diagnosis and prognosis of many acute diseases, led me to inquire whether any reliable indications could be obtained from the use of the thermometer in cases of early pregnancy. To determine this question, I have made a large number of experiments. The temperature has always been taken by introducing the bulb of one of Casella's self-registering thermometers into the vagina, and leaving the instrument there for five minutes. It is unnecessary to do more than record the general conclusions at which I have arrived. They are as follows:

(1) The normal temperature of the vagina in healthy adults, about midway between the catamenial periods, varies from 97.6 to 99° Fahr.

(2) In no case of pregnancy, beyond the first month, has the temperature been found below 99°.

(3) There is no progressive increase in the temperature as gestation advances. In some cases of healthy pregnancy, the thermometer has registered 99.8 at the end of the second month; while in the same patients, two months later, there has been a fall to 99.5.

(4) During the last month of gestation, the average temperature has been 100°; but it has been found as low as 99°, and as high as 103° without the existence of any appreciable disease in the mother or fœtus.

(5) In chronic diseases of the vulva, vagina, uterus, bladder, and rectum, occurring in non-pregnant women, the vaginal temperature varies from 98° to 100.5.

(6) The fair conclusion from the foregoing seems to be, that the data obtained by the employment of the thermometer have no significance in the diagnosis of pregnancy.

Many other trivial signs have been alluded to by various observers; but none of them have individually much, if any value. One gentleman—Dr. Pollender—writing in 1845, says that during a practice of eighteen years, he has noticed a peculiar smell of the vaginal mucus to be a constant and unerring sign of preg-

nancy. The smell is described as musty, something like that of spermatic fluid or liquor amnii; and, after a vaginal examination, it cannot be mistaken for any other odor. In a great many cases of pregnancy, during the first and second and third months, when the condition of the patient was doubtful, Dr. Pollender never, in a single instance, failed to make a correct diagnosis by means of this sign. According to his experience, the odor is perceptible as early as the eighth day of gestation.

In America, a physician has recently proposed to detect early pregnancy by the administration of small doses of ergot. The unimpregnated uterus gives no indication of the specific action of this drug; while the gravid organ almost invariably responds to its influence, as is evidenced by some uneasiness in the back, and by pain in the upper part of the thighs. These symptoms, it is said, are sufficient to establish the diagnosis; and may be induced without any risk of injury to the mother or the ovum.

Stein, who wrote in 1770, taught that the most certain sign of pregnancy is to be found in the shape of the os uteri; which, from being a transverse fissure, assumes a circular form after impregnation. This assertion was propagated as true by most German writers on obstetrics for many years; but no one, in the present day, attaches the slightest importance to this imaginary change.

Dr. Osiander, of Göttingen, places some reliance on the detection of arterial pulsations at the upper part of the vagina, or on some point of the supra-vaginal portion of the uterus accessible to the finger. This vaginal pulse is due to the hypertrophy of the vaginal and uterine arteries which has resulted from fecundation. Such hypertrophy, however, occurs equally from disease.

Beccaria suggested as a test, the existence of severe pulsating occipital headache; which is accompanied with giddiness on moving, and intolerance of light. The pain comes on suddenly, induces a disposition to sleep, and often passes away without aid from medicines. Moreover, it frequently assumes a distinctly periodic character. It is said to have been observed prior to the fourth month, in women who were not aware of its cause. However this may be, as a rule we must allow, that although this peculiar pain is possibly an occasional concomitant of pregnancy,

yet it is too rare and uncertain in its occurrence to bear any importance as a symptom of this condition.

Lastly, the general physical and moral changes which take place under the influence of pregnancy are regarded as symptoms by some practitioners. These gentlemen particularly insist upon the importance of noting the sharpening of the features, and, indeed, of the whole body—excepting the breasts and abdomen—which often occurs; the change of color in the complexion, or even a discoloration of the skin in various parts of the body, as of the forearms and hands, &c.; the darkening of mole-spots; the alteration in the cutaneous secretion, so that those who have usually had a moist skin now find it harsh and dry, and the reverse; the existence sometimes of an unpleasant and rather powerful odor in the perspiration; the increase in the strength and frequency of the pulse; the attacks of toothache, salivation, and giddiness; the numerous fits of fainting which some women experience at this time, and at this time only; the frequent occurrence of varicose veins in the lower extremities; the antipathies, strange appetites, and longings for improper kinds of food which annoy certain women; and the distressing dreams which afflict a few, in consequence, probably, of a disordered condition of the alimentary canal acting upon an irritable temperament. The changes in the nervous system are sometimes well marked. Thus, there is often a peculiar alteration of taste and disposition. Women naturally irritable and hasty become cheerful and contented, or *vice versâ;* and many who are accustomed to give way to habits of luxury and idleness now alter, and seem desirous to be active and industrious. One author cites a case where a lady during pregnancy possessed sound judgment but lost her memory; and who, after parturition, recovered her memory at the expense of her judgment. Another instance is recorded in which a female became—after an attack of inflammation of the brain—melancholy, pensive, and at length imbecile; but happening to get pregnant, she recovered her gayety and regained completely the use of the intellectual faculties, though the improvement was only manifested during the time of gestation. After her labor she relapsed into her former miserable condition, until a second pregnancy occurred, during which the same phenomena were presented. I have seen a case in which there was complete loss of

voice during the last three months of gestation; but the lady was of a very peculiar temperament, and previous to her marriage had long suffered from hysteria. The aphonia continued for a fortnight after labor; when, under the stimulus of galvanism, restoration took place. So, again, women afflicted with deafness are said to have recovered and retained the sense of hearing during the time of gestation. Beer has related the particulars of a young Jewess, who at the commencement of each of her first three pregnancies became amaurotic, and continued blind till after her labors; but who subsequently bore children without experiencing this inconvenience. Many other such examples of amaurosis occurring during pregnancy are also known. But it is scarcely necessary to remark that these instances are all exceptional, and establish no general law. Hence it can only be said, as the result of the examination of a large number of women in different stations of life, that pregnancy very commonly exalts the general sensibility, and predisposes to the development of nervous disorders in all their Protean varieties.

CHAPTER III.

THE DISEASES WHICH SIMULATE PREGNANCY.

1. Spurious pregnancy. Phantom or muscular tumors.—2. Ovarian dropsy. Dropsy of the Fallopian tube. Acute inflammation of the ovary, ending in suppuration.—3. Ascites. Dropsy of the amnion. Great distension of the bladder.—4. Fibroid tumors of the uterus.—5. Enlargements of the liver, kidneys, spleen, etc. Tuberculated disease of the peritoneum. Fæcal accumulations. Encysted dropsy of the peritoneum. Cysts in the folds of the omentum, etc.—6. Hæmatometra, hydrometra, and physometra.

The diseases which may give rise to an unjust suspicion of the existence of pregnancy, are principally those that produce enlargement of the abdomen. The chief of these are: (1) Spurious pregnancy; (2) Ovarian dropsy; (3) Ascites; (4) Fibroid tumors and large polypi of the uterus; (5) Enlargements of the liver, kidneys, spleen, &c.; and (6) Distension of the cavity of the uterus with blood, water, or air. I shall make no remarks in this chapter on the diagnosis of the vesicular mole—the so-called uterine hydatids—from normal pregnancy, because the subject will be subsequently treated of. Neither is it necessary, for the same reason, to speak of those curious cases where a woman with an extra-uterine fœtus in her abdomen, the result of a previous conception, again becomes pregnant, the child being then formed in the uterus.

Before proceeding to the separate description of the diseases above enumerated, let me urge upon the practitioner the necessity for always exercising great caution and deliberation in forming his diagnosis. He will find his investigations impeded at every step unless he can avail himself of a practised eye, a sensitive and well-trained ear, and a delicate sense of touch. Until a large experience has rendered attention to rules unnecessary, it is as well to follow some plan in examining a case of abdominal enlargement. Thus in every instance, it should first be determined whether there be any tumor, or merely the appearance of one. Secondly, if a tumor exist, is it within the abdomen, or

only in the abdominal walls? Thirdly, if it be decided that there is a tumor in the abdominal cavity, the question arises as to whether that tumor be a foreign body like an ovarian cyst or uterine fibroid; or some organ, such as the liver or kidney, which has undergone hypertrophy, or has become infiltrated with cancer; or whether it be simply an enlarged uterus or a distended urinary bladder? And, fourthly, some abnormal growth having been detected and its nature determined, it ought still to be ascertained that the case is not complicated by the coexistence of pregnancy.

But even when a careful examination has been made, and when every precaution—such as placing the patient in a proper position, having the bladder empty, &c.—has been taken to avoid error, it may still only be possible to give an ambiguous opinion. In many instances of abdominal tumor it is far easier to say what the disease is not, rather than what it positively is. The diagnosis of pregnancy, when the fœtus is dead, and the abdominal walls of the mother are loaded with fat, will often be very difficult. Cases of renal cancer have over and over again been mistaken for tumors of the ovary. Spasmodic contractions of the recti muscles of the abdominal wall have frequently given rise to an unfounded suspicion of uterine enlargement; while accurately to distinguish between a cystic tumor of the uterus, a similar growth of the ovary, or a large collection of fluid in one of the Fallopian tubes, is often impossible. Remembering then these facts, I may without assumption remind the practitioner, that it will be far better in any doubtful case for him to confess ignorance, than to run the risk of inflicting pain and misery on a defenceless woman or of forfeiting his own reputation by giving an erroneous judgment. To be able to trace effects to their causes is often a high proof of skill; but unfortunately such ability cannot always be shown. In some cases the most experienced physician will have misgivings: hence, none need be so foolhardy as to descend to guesswork. He, however, who really desires to prove accurate will generally be so; since he will take care not to come to a positive conclusion without a careful review and calm consideration of all the circumstances of the case. He will weigh well all the data on which reliance can be placed; for otherwise, though his judgment may be founded on what is apparently strong evidence, yet from not considering or from being ignorant of one or two small facts, the deduction is not unlikely to be wrong.

1. Spurious Pregnancy.—Should any of my readers entertain the idea that the symptoms of pregnancy are so peculiar and distinct that they can only be mistaken by the rash or ignorant, the perusal of this chapter will probably serve to undeceive them. An example of spurious parturition has been related in a preceding page; but in this case no opportunity was afforded me of examining the patient until the close of the sham gestation. We shall now consider the subject in all its bearings; and it will at least be found that few disorders are met with in the practice of medicine more remarkable than this one of spurious, simulated, or pseudo-pregnancy—the *fausse grossesse nerveuse*, or *grossesse simulée par illusion pure*, of French writers.[1] It serves to mislead not only old nurses and women who have given birth to several children, but so puzzling are many of its features, so striking is the resemblance which its symptoms bear to those of pregnancy, that the best-informed practitioners may be led into error by it unless they exercise considerable skill and wariness.

To convey a clear notion of this matter, let it be imagined that we have before us a typical case. We shall find the following succession of phenomena, occurring possibly in a woman about forty-five years of age, who now believes that she is nearly seven months gone with child. She is the mother of a family; but since her last parturition there have elapsed some six or eight years. The monthly periods have either ceased or become irregular; or the flow comes on at the proper period, but is very scanty. It is stated that the abdomen began to swell from the pubic region, in the same gradual manner as in pregnancy; but on examination the enlargement is seen to be more diffused when the patient lies on her back than it is in true pregnancy, while there is an appearance of unusual constriction around the lower ribs or over the diaphragm. The spine is much arched forwards, so that the hand of the examiner can easily be passed between the back and the bed on which the patient is lying. The breasts have become painful and enlarged; blue veins are seen traversing their surface; the areola is more or less darkened; and a serous fluid resembling milk is secreted, which escapes on pressure from the orifices of the milk ducts. The

[1] Dr. Mason Good speaks of this extraordinary affection under the term of pseudocyesis, from ψευδος, a lie, and κυησις, pregnancy. This Greek name, however, has no advantage over the plain English employed in the text.

digestive organs have got disordered: there is a capricious appetite, a frequent sense of nausea with morning sickness, salivation, and diarrhœa alternating with constipation. There is muscular debility, an excitable condition of the nervous system, cramp, and retraction of the leg. The hue of the skin has become changed, has darkened somewhat. The veins of the lower extremities have become varicose. The patient is sensible of movements in the abdomen, which she asserts can only be those of a live fœtus; though if closely questioned she will allow, that they are not altogether identical in character with such as she has felt on occasions when really pregnant. As these movements are at least partially due to the passage of flatus from one portion of the intestine to another, they are appreciable by a second party, who therefore confirms the patient in her erroneous views. She is certain that she is pregnant, but does not know exactly when labor may be expected. If the phenomena here presented persist, the spurious gestation will probably be succeeded by a spurious parturition; and strong labor pains may come on, possibly attended by all the peculiar symptoms which may have characterized a previous lying-in. In short, the illusion will be complete; and will be kept up until the man of science steps in and dispels it by showing that the uterus is empty, and that the phenomena are simply of constitutional origin.

Spurious pregnancy is by no means an unfrequent disorder. The unmarried, and such as have never borne children, are liable to be affected with it, as well as the mothers of families; though the latter suffer from it more frequently than the former. It may occur early in married life; or about the climacteric period, when women so commonly present complex nervous symptoms. The favorite season for its happening is in the decade following the thirty-seventh year.

The difficulty of diagnosing this condition is increased by the curious fact, that women who have suffered from remarkable idiosyncrasies in previous normal pregnancies have them repeated during spurious gestations. I have seen a lady who had been pregnant three times, and on each occasion had suffered from chronic urticaria of a very rebellious nature. When she came under my care with symptoms of spurious pregnancy, she was likewise afflicted with this eruption. A monthly nurse,

who gave evidence on the Gardner peerage trial, asserted that she could always calculate the date of her labor, inasmuch as she invariably fainted when quickening took place. She afterwards applied to Dr. Reid to be attended in her confinement; stating that she was seven months advanced in gestation, that she had fainted as usual on quickening, and that she felt the movements of the child. Yet, on a careful examination, it was discovered that her symptoms were merely due to spurious pregnancy. Sir James Y. Simpson relates a curious case, where a lady, who had previously given birth to eight children, passed over one catamenial period, and imagined that she had again fallen in the family-way, because the breasts had enlarged and begun to secrete milk. The abdomen had also become prominent, and she had felt movements resembling those of a fœtus. On examination the uterus was found to be perfectly normal, except that there was slight ulceration around the os; but the lady was firmly convinced of her pregnancy, inasmuch as she lost great quantities of hair, and she had always had such a falling off of the hair in her previous pregnancies.

The mode in which these cases terminate varies. Sometimes, after the symptoms have persisted for a variable number of weeks or months, they suddenly disappear, and the patient at once gets well. This is an occurrence which happens most frequently in women who have never borne children. In other instances the symptoms continue for ten, twelve, or twenty months; and, in fact, do not cease until the employment of proper remedial measures. While, in a third class, the spurious pregnancy is succeeded at the end of nine months by the phenomena of a spurious parturition; this termination being more rare than either of the others.

To prevent the possibility of a suspicion that in the foregoing remarks an exaggerated view has been taken of this form of morbid action, the reader's attention is requested to a few of the most interesting examples of spurious pregnancy which are scattered through our medical literature. We shall find that more than two centuries ago the illustrious Harvey, in his work on parturition, attempted to prevent his readers from being deceived by "erroneous tokens of pregnancy;" and he enforces his precepts by the relation of the two following cases:

"I am acquainted," he says, "with a young woman, the daughter of a physician with whom I am very intimate, who experienced in her own person all the usual symptoms of pregnancy. After the fourteenth week, being healthy and sprightly, she felt the movements of the child within the uterus, calculated the time at which she expected her delivery, and when she thought, from further indications, that this was at hand, prepared the bed, cradle, and all other matters ready for the event. But all was in vain. Lucina refused to answer her prayers; the motions of the fœtus ceased; and by degrees, without inconvenience, as the abdomen had increased so it diminished. She remained, however, barren ever after."

"I am acquainted also with a noble lady, who had borne more than ten children, and in whom the catamenia never disappeared except as the result of impregnation. Afterwards, however, being married to a second husband, she considered herself pregnant, forming her judgment not only from the symptoms on which she usually relied, but also from the movements of the child, which were frequently felt both by herself and her sister, who occupied the same bed with her. No arguments of mine could divest her of this belief. The symptoms depended on flatulence and fat."[1]

Harvey, moreover, notices in the Essay on Conception, the occurrence in animals of phenomena similar to those we are here considering. He says:

"Overfed bitches, which admit the dog without fecundation following, are nevertheless observed to be sluggish about the time they should have whelped, and to bark as they do when their time is at hand; also to steal away the whelps from another bitch, to tend and lick them, and also to fight fiercely for them. Others have milk or colostrum, as it is called, in their teats, and are, moreover, subject to the diseases of those which have actually whelped. The same thing is seen in hens, which cluck at certain times, although they have no eggs on which to sit; some birds also, as pigeons, if they have admitted the male, although they lay no eggs at all, or only barren ones, are found equally sedulous in building their nests."

Sydenham, Mauriceau, Lamotte, and others, also allude to or record instances of nervous pregnancy; but neither the cases nor the observations possess any special interest, beyond showing that these authors were well acquainted with the subject. M. Russel, of Vars, met with a remarkable example, from the published narrative of which the chief particulars are selected.[2] They are as follows:

Mary Gibaud, residing at Vars, department of the Charente, enjoyed good health prior to marriage at about thirty years of age. Shortly after this

[1] The Works of William Harvey, M.D. Sydenham Society's Edition, p. 528 London, 1847.

[2] The Medico-Chirurgical Review, New Series, vol. i, p. 495. London, 1824. The paper is quoted from the Gazette de Santé, for January, 1824.

epoch, she apparently became pregnant. The menses ceased, nausea and morning vomitings occurred, the abdomen enlarged, the motions of the fœtus were felt, or supposed to be felt—in short, every symptom of pregnancy was present. At the end of nine months labor pains commenced, and went on increasing for 36 hours, but without causing any enlargement of the os uteri. The midwife, unable to make out the case, called in a surgeon of great reputation. At the moment of his arrival, the patient had just fainted from a considerable uterine hemorrhage, and the surgeon quickly proceeded to deliver. He was not a little surprised to find the uterus in an unimpregnated state. On recovering from the syncope, the labor pains had gone, but in two or three hours they returned as violent as ever. These were relieved by copious bleeding, and the patient recovered. But at the end of a month she again had symptoms as if she had become pregnant, and went for another nine months, until labor pains set in as before. A third time this happened, and she was then treated for dropsy. Paracentesis abdominis was performed, but no fluid came away. She recovered, and lived for twenty years; having all the symptoms of pregnancy, her breasts being always gorged with milk, and every nine months a kind of attempt at parturition taking place, which was only relieved by loss of blood. She died in the 51st year of her age, from phrenitis; and on examining the abdomen every organ was found healthy, but there was a considerable quantity of fat in the omentum.

A very similar instance to the foregoing has been published by Dr. Ambroise Tardieu. The subject of this gentleman's notice was forty-four years of age, and had been delivered of a child after a natural labor six years before she came under observation. Three years after her confinement the catamenia ceased; while the breasts became full, and the abdomen gradually enlarged. Then movements were felt; and at the end of nine months labor pains set in, which resulted in nothing more than the escape of some water and shreds of membrane. Still the abdomen continued enlarged, and a second spurious parturition occurred at the close of another nine months; and so again and again, for four times in all.[1]

The Cæsarean operation was performed on a patient at Berlin, in August, 1828, by Professor Dieffenbach, at the desire of Dr. Heim; who, with many other eminent physicians, had diagnosed the existence of extra-uterine gestation. The woman was twenty-one years of age, and had experienced most of the symptoms of pregnancy. More especially she asserted that she felt the movements of the child daily. When the time calculated on for delivery was past, and she had spent some days of suffering from

[1] Annales d'Hygiène Publique et de Médecine Légale. Tome xxxiv, p. 429. Paris, 1845.

the periodical recurrence of violent pains, the abdomen was opened. To the amazement of all present, not only was no child found, but not even a tumor of any kind. Dr. Heim states that he introduced his hand into the abdominal cavity, and detected nothing from which he could have inferred the existence of a fœtus. Fortunately, the wound healed completely in three weeks, and finally the patient recovered. The operation, however, was not the only source of danger to which she was exposed; for during her illness she lost upwards of sixty ounces of blood in four venesections, had two hundred leeches applied to the belly, and had ice-cold applications day and night.[1]

Dr. Gooch relates the following case. He says:

"I was introduced by an eminent physician to a very young married lady, for the purpose of attending her in her approaching confinement, of which her projecting abdomen gave visible intimations; and I was directed to call on her occasionally, that she might become accustomed to me before the time for my attendance arrived. During these calls I learnt gradually the particulars of her marriage. She had been attached to a young man, her equal in station, but so profligate that her parents forbade him the house. Nevertheless, the lovers continued to meet by stealth, and one fatal evening they became as man and wife in all but the marriage ceremony. After this intercourse had been going on a few months, the young lady observed that her belly was enlarging. It was at length noticed by her mother. This led to an inquiry, and the young lady confessed all. The discovery of course produced a great uproar in the family; her parents agreed that, as the young couple had gone so far, it was absolutely necessary that they should go a little further. The lover was called upon; and, as the young lady had brothers who understood the use of the pistol, the young couple were soon married and placed in furnished lodgings. It was at this period when I was first introduced to them. I continued to call on the bride for some time; but, after two months, I one day remarked that although she still continued large, she was not larger than when I first saw her. When I pressed the abdomen it had not the firmness of pregnancy, and she felt no internal motions. When I inquired about her menstruation, I was told that she had never menstruated in her life; menstruation had not ceased, simply because it had never begun. I now expressed strong suspicions that she was not pregnant, and advised the question to be settled by an examination. It was so. I found the umbilicus sunk, the abdomen distended by a soft flatulent tumor; the neck of the uterus of its full length, its body not in the slightest degree enlarged. I told my patient and her sister that she was not pregnant, but they would not believe me, and directed a consultation with the same eminent physician who had introduced me to them. He met me; and as he was one of the very few medical physicians who are expert at vaginal examinations, he was soon as well satisfied as myself that the young lady was not pregnant. The communication caused great disappointment in the

[1] Dr. Ernest Ludwig Heim's Vermischte Medicinische Schriften, p. 402. Leipzig, 1836.

family, but in no one so much as in the young husband, whose rage was boundless at discovering that he had been compelled to marry her on a false supposition."[1]

The particulars of a well-marked case were communicated to Dr. Montgomery by Dr. Labatt. A lady who married rather late in life, and remained some years without conceiving, at length had suppression of the catamenia; from which, and other symptoms, she deemed herself to be pregnant. She increased in size, and at the expected time pains came on, which were considered as those of labor; in consequence of which she sent for her medical attendant, who concurred in the opinion of her being parturient, and remained with her. At the end of forty-eight hours, as the pains continued severe, Dr. Labatt was called into consultation, in order to determine whether she ought not to be delivered with instruments. The gentleman in attendance was doubtful as to the best instruments to apply; remarking that he was unwilling to use the crotchet, because he felt sure that the child was alive, having applied the stethoscope several times during the night, and detected the pulsations of the fœtal heart. Dr. Labatt, having examined carefully, suggested that there was no necessity for the use of any instrument, as the lady was not in labor; and for the best of all possible reasons, because she was not pregnant. This proved to be the truth.

Dr. Keiller related to the Obstetrical Society of Edinburgh, in March, 1850, the history of a hysterical young woman, nineteen years of age, who—from the large size of the abdomen, and the occurrence of pains which caused such cries that the whole neighborhood was disturbed—was considered by her friends to be suffering from a difficult labor. Her supposed labor had continued for a fortnight, when an irregular practitioner who was in attendance, proposed performing the Cæsarean section as a last resource; since he found the bones of the pelvis so grown together, that "the child could never be born in the natural way dead or alive." When Dr. Keiller had seen her and made a careful examination, he tried in vain to disabuse the minds of her relations of the idea that she was pregnant. Various plans of treatment were instituted, but without any marked benefit;

[1] An Account of Some of the Most Important Diseases Peculiar to Women. By Robert Gooch, M.D. Second Edition, p. 220. London, 1831.

indeed change of air was the only thing that seemed to do her any good. After one of these removals, she was able to return for a short time to her usual employment at a mill, though her abdomen always remained of a large size. Dr. Keiller then lost sight of her for eight years, when she presented herself in Edinburgh, with a child that she had really been delivered of in the interval. She complained, however, that all her old symptoms were reappearing. The abdomen was very large and tympanitic; but on putting her under the influence of chloroform the belly immediately became flat, and the uterus was felt to be of its normal size. When the effects of the anæsthetic passed off, the abdomen again enlarged in size and resumed its former bulk. The enlargement continued for some months, during which she was under observation. I am not acquainted with the final result.

The last instance which will be referred to, is one which occurred in the practice of Sir James Simpson, who mentions that he was one day summoned in great haste to a patient at the Maternity Hospital of Edinburgh. The case was reported by the house surgeon—a gentleman of remarkable acuteness—to be one of placenta prævia, requiring the operation of turning. The woman had the phenomena of labor present, with severe menorrhagia; but there was no child to turn, as she was not pregnant.

The question now naturally arises,—What is the nature of the abdominal swelling in this affection? It was long thought that the symptoms of spurious pregnancy were due simply to the distension of the intestines by flatus, combined with the excessive deposition of fat in the abdominal integuments and in the omentum. We are told that on examining the body of Joanna Southcott after death, the womb appeared smaller than natural, free from disease, and containing neither "the promised Shiloh, nor any other fœtus." But the walls of the abdomen were four inches thick from adipose tissue, the intestines were distended with gas, and the omentum was one large mass of fat. Very possibly the combination of these conditions may alone have sufficed to produce the disorder in other instances; though without a doubt, in the majority of cases, there has been something more. This additional something is probably irregular or excessive action of the diaphragm and other abdominal muscles, by which the intestines are forced low down in the cavity of the abdomen. In many instances, also, it has been thought that irritation or chronic

inflammation of one or both ovaries existed; this irritation producing contraction of the muscles by reflex action. Again, it has not unfrequently been found that the patient was suffering from retroversion or retroflexion of the uterus. The chief evidence which can be offered in support of the hypothesis here suggested is, that in the *first* place, in some marked examples, a long tube was passed per anum, but not a bubble of air could be seen to escape from the nozzle, which was held under water; though as the patients became insensible from the inhalation of chloroform, the enlargement disappeared. *Secondly*, that positive symptoms of ovarian or uterine irritation are often present. There is especially pain on pressure over one iliac region, irregularity or suppression of the catamenia, and intense backache; while complaint is made of pain extending down one leg with, perhaps, retraction of the limb. And *thirdly*, that if the patient be slowly but thoroughly placed under the influence of chloroform, or of a mixture of equal parts of chloroform and pure ether, the abdomen will be seen to flatten and the tumor to entirely subside; the latter slowly melting away in proportion as the anæsthetic relieves the diaphragmatic and abdominal muscles from the influence of the reflex nervous action. As consciousness returns, however, the muscles become tense and prominent, and the swelling gradually forms again; until the phantom tumor is found possessing all its original characters, by the time the anæsthesia has completely passed away.

In some hysterical young women, the seeming enlargement may be, perhaps, caused by a great arching forward of the lower dorsal and upper lumbar vertebræ; in which instances the spine becomes straightened on anæsthesia being induced. Whatever may be the cause, however, if additional evidence be required in any particular case that the tumor is not formed by the pregnant uterus, it will be found in the fact that there is generally resonance on practising percussion over the abdomen; that the uterus, on examination per vaginam, can be discovered small in size, and with its body undeveloped; and that none of the auscultatory phenomena of pregnancy can be detected. The first test is the least reliable; being often rendered uncertain by the deposition of fat in the abdominal walls or in the omentum, or by overdistension of the bladder, or by the existence of great tender-

ness rendering a satisfactory tactile examination almost impossible.

The cure of spurious pregnancy, though difficult and almost always tedious, is not beyond the reach of our art. At the commencement, when symptoms of ovarian irritation are manifested, they must be relieved by the administration of chlorate of potash in full doses, three or four times a day. For the lessening of ovarian tenderness and congestion, no drug can be compared with this in efficacy. If the uterus seem mainly in fault, and there be an absence of ovarian fulness or pain, the bromide or the iodide of potassium, or the iodide of ammonium will be indicated. In either case, the progress towards recovery is expedited by the employment of warm hip-baths; by the use of sedative injections; or by the introduction into the vagina of ointments containing belladonna, or conium, or henbane. A very efficient medicated pessary, which may be used every night at bedtime, can be made by mixing together four or five grains of the extract of belladonna, two grains of the extract of opium, ten grains of iodide of lead, a few drops of olive oil, and sixty grains of the concrete oil of theobroma. If thought advisable, twenty or thirty grains of the strong mercurial ointment may be substituted for the iodide of lead. At the same time, all mental anxiety is to be relieved; the patient is to be impressed with the conviction that she is not pregnant, and that she will get well; while, should she insist—as she is not unlikely to do—that if she has not a child within her there is certainly a live animal of some kind, the delusion must be got rid of by gentle reasoning. It will often, also, be useful to place her under the influence of chloroform; and, while she is in a state of insensibility, to show her flattened abdomen to her mother, or some confidential female friend. The general health, moreover, is to be improved by a course of mild tonics, especially by such remedies as phosphoric acid and quinine or bark, phosphate of zinc and nux vomica, the officinal aromatic mixture of iron, &c. Change of air, particularly to the sea-side, will be useful. Any sympathetic vomiting which may be present is to be relieved by the administration of ice, of drinks impregnated with carbonic acid gas, of bismuth and morphia, of pig's pepsine at the meals, or especially by giving one or two grains of the oxalate of cerium three or four times a day. Where the patient is troubled with flatulence, ten grains

of the compound assafœtida pill given twice a day will most probably relieve it; especially if, at the same time, the abdominal walls be supported by a bandage. The condition of the abdominal viscera and their secretions should be particularly attended to. Any marked excitability of the nervous system is to be suppressed by administering such antispasmodics as the ammoniated tincture of valerian, galbanum, or assafœtida. And finally, the abdominal muscles themselves ought to be strengthened and their irritability diminished by the application of galvanism, by sponging with salt water, and by stimulating liniments together with the frequent employment of gentle friction.

The remark has already been made, that the terms spurious or pseudo-pregnancy are very unsatisfactory; for it is clear that they convey no notion whatever of the nature of the disorder. But I think the foregoing observations will show that we are not at present in a position to suggest a better name for this affection, since the phenomena produce symptoms which seem at present to defy any exact nosological arrangement.

Allied closely to cases of spurious pregnancy are those remarkable instances in which we find a contraction or relaxation of the abdominal muscles, simulating a simple but well-defined tumor. These *phantom* or *muscular tumors* vary in size from a cricket-ball to an adult head; they may be stationary and firm and unyielding, or they may change their relative position from day to day, or they may appear movable as if attached by a long pedicle; they may be insensible to the touch, or acutely tender; and they sometimes temporarily melt away under steady and prolonged manipulation, or they disappear for a long period and then return, or they remain persistent for years. Occasionally, moreover, it can be clearly distinguished that they have their seat in the parietes, and then especially there is resonance on percussing over them. In their diagnosis care must be taken not to mistake these tumors for movable kidneys. It is well known that occasionally both the renal organs present an unusual degree of mobility; or one kidney may be movable to a considerable extent, while the other is stationary. So also, a spleen displaced downwards may form a palpable tumor, as low as the left iliac region; and should there also happen to be any

displacement of the pancreas, a very puzzling enlargement will result.

Patients in whom phantom tumors are found, very generally appear to be in bad health; being often anæmic, and presenting phenomena which are commonly set down as due to hysteria, or to "spinal irritation." They are also not unfrequently afflicted with neuralgic pains; and are sufferers from leucorrhœa, dysmenorrhœa, dyspepsia, and constipation. They usually experience great mental uneasiness and depression about the swelling; their anxiety, indeed, being often the cause of their seeking advice. Happily, however, these spasmodic contractions or relaxations of portions of the recti or obliqui muscles need give rise to no anxiety on the part of the physician; since they may be readily dispelled by curing any uterine or ovarian disease, if such be present, and then by improving the general health. In other words, remedies which induce a natural performance of the uterine functions,—ferruginous tonics, galvanism, small doses of nux vomica, galbanum, mild aperients, good diet, and sea air, will remove this tendency of the muscles to feign, as it were, serious disease. The only danger that can arise is from these shams being mistaken for dangerous morbid growths, when a formidable plan of treatment is not unlikely to be proposed. It is rather painful to know that such mistakes have not unfrequently been committed. In the statistical account of eighty-one cases of ovariotomy collected by Mr. Benjamin Phillips, it is shown that in as many as five instances no tumor at all was found upon cutting into the abdomen;[1] and at least two more such instances have occurred since this report was published. The most remarkable instance of this error with which I am acquainted, is that recorded by Mr. Lizars, the chief features of which are as follôws:

In the year 1821, Mr. Lizars was called to see a woman with an abdomen as large as at the ninth month of pregnancy. On examination the whole abdominal cavity appeared to be occupied with a tumor, which seemed to roll from side to side. The uterus per vaginam felt natural; and the catamenia had been regular, but attended with pain. The patient was 27 years of age, had borne one child, and had experienced one miscarriage. The enlargement commenced towards the end of 1815; and a few months afterwards she consulted numerous medical men, who agreed that she was pregnant. Several of the principal practitioners of Edinburgh afterwards saw her with

[1] Medico-Chirurgical Transactions, vol. xxvii, p. 468. London, 1844.

Mr. Lizars, and all were of opinion that there was disease of one or both ovaries. As the pain was intolerable, it was decided to remove the tumor. Accordingly, on the 24th of October, 1823, Mr. Lizars made a longitudinal incision through the parietes, parallel with the linea alba, from about two inches below the ensiform cartilage to the crest of the pubes. Having thus freely opened the abdominal cavity, he proceeded to examine the state of the contents; when, to the astonishment of all present, the diaphragm was seen to be acting with "great vigor and powerful impetuosity," but no tumor could be found, for none existed. Fortunately the patient recovered.[1]

In any similar case to the foregoing, or, indeed, in any instance in which the practitioner is doubtful whether he has to deal with a true abdominal tumor or with only a phantom, the exhibition of chloroform, or of a mixture of equal parts of chloroform and pure ether, will decide the question; for muscular action, whether it simulate pregnancy or a morbid growth, is temporarily annihilated by the inhalation of an anæsthetic.

2. Ovarian Dropsy.—The diagnosis of this disease is by no means always so easy as the physician might imagine from examining a well-marked case. Numerous errors are even now daily made in practice, if I may judge from my own experience. I might almost say that it has happened to me, as a rule, that when consulted for what has been termed an ovarian tumor, I have found the enlargement of the abdomen to be due either to excessive flatulence, or to ascites, or to the presence of a fibroid tumor of the uterus, or to be caused by pregnancy.

Many examples have been published in which either an ovarian tumor has been mistaken for pregnancy, or the converse. Thus in the celebrated case of Mademoiselle Famin, published by Valentin at Berlin in 1768, a charge of concealed pregnancy and child-murder was erroneously instituted, in consequence of an extreme case of ovarian dropsy.—Dr. Gooch relates that a woman was taken into the operating theatre of an hospital to be tapped for a supposed dropsy of the ovary. The surgeon, however, finding that she had not been carefully examined, sent her back to the ward; a precaution which was by no means superfluous, since she brought forth a child before the next operating-day.—Dubois mentions that he has seen a female become pregnant two years after the cessation of the catamenia. The woman

[1] Observations on the Extraction of Diseased Ovaria. By John Lizars. P. 6. Edinburgh, 1825.

finding her abdomen enlarging, and mistaking the cause, entered the medical department of an hospital; and so little idea had the physician, whose care she was under, that she was pregnant, that he actually delivered a clinical lecture on the case, as being a well-marked example of ovarian dropsy. On examination, Dubois distinctly heard the fœtal heart, and soon afterwards labor supervened.[1]—Mr. Baker Brown says that he has seen at St. Mary's Hospital, on the same day, no less than three cases, sent by different medical men, in which pregnancy had been mistaken for ovarian dropsy. In one of these cases the os uteri had begun to dilate, and the woman was delivered the same afternoon.[2] And lastly, Sir James Simpson, in his clinical lectures, alludes to an instance where, some thirty years ago, a female with enlargement of the abdomen was supposed to be the subject of an ovarian tumor by several gentlemen, who all concurred in the propriety of, and necessity for, performing the operation of ovariotomy. The day was fixed, and everything prepared for removing the tumor by the abdominal section, when fortunately the patient saved herself all the horrors and dangers of the operation by giving birth to a child a few hours beforehand; thus dispelling most satisfactorily and efficiently the supposed morbid growth. Even more painful, and much more recent examples might be quoted; but it is hoped sufficient has been said to put the medical man on his guard, to teach him that the diagnosis is often difficult, and to prevent his giving a hasty opinion in any particular instance.

An ovarian tumor may consist of a single cyst, or of numerous cysts inclosed in a parent cyst, or of solid matter. The latter are comparatively rare; for of all these tumors ninety-five per cent. will be found to consist originally of cystic growths. The simplest ovarian cysts are formed by the enlargement of one or more Graafian vesicles; their walls consisting of three coats,—*i. e.*, peritoneum, fibrous capsule of ovary, and the greatly thickened wall of the vesicle itself. The multilocular tumors probably depend upon the formation of adventitious cysts; in other words, they are the result of entirely new growths. Ovarian cysts may contain a pale amber-colored fluid like urine or the fluid formed in ascites; or a dirty chocolate-like fluid; or a thick glairy gelatin-

[1] Journal de Médecine et de Chirurgie, p. 207. Paris, May, 1850.
[2] The Lancet, p. 117. London, 30th January, 1864.

ous matter; or a quantity of fatty substance mixed with hair, teeth, or small bones. Ovarian tumors are more common in married than in single women: of 136 published cases, 88 occurred in the married, 37 in the single, and 11 in the widowed. It is very probable that they are commonly associated with sterility, though it must not be imagined that the disease necessarily prevents impregnation. They happen most frequently between the ages of 20 and 35; though I have seen an ovarian tumor taken from the body of an infant who died of peritonitis, and have had patients afflicted with this disease who were more than 55 years old. The tumors vary very much in size. In the infant just mentioned, the cyst was about the size of a hazel-nut; while in the museum of the College of Surgeons is a preparation showing a single cyst which measures four feet in circumference in one direction, and three in another. Very frequently the abdomen, much distended, is found apparently quite filled by the growth. It is a common opinion, that ovarian cysts run their course slowly; whence Dr. Gooch asserts that the duration of the tumor, always much beyond nine months, is alone a sufficient guide for diagnosis. This opinion is in all probability erroneous. From a careful examination of the question, I believe that if we were to collect the histories of 500 patients, we should find that about 70 had died before the end of the first year; 75 more before the completion of the second; 120 more before the termination of the third; about 150 more before the end of the fourth; and 75 more before the completion of the tenth, leaving some 10 alive at the end of ten years. It is certain also, that the growth of the multilocular tumors is much more rapid than of the unilocular cysts. The causes of ovarian dropsy, as assigned by the patients themselves, increase the difficulties of diagnosis; for we find that in a large proportion of cases this disease is attributed to the excitement of marriage, or to sudden suppression of the menses. It has also been thought to be due to parturition, to abortion, to exposure to cold, to disappointed affection, and to falls or blows.

The diagnosis of a cystic ovarian tumor, as before mentioned, is often attended with difficulty. In the early period, when the tumor is confined to the cavity of the pelvis, the patient seldom seeks advice; since she is either unaware of the existence of any morbid condition, or, if she experience some slight inconvenience, she deceives herself as to its cause. At this stage, however, if

an examination per vaginam be made, a tumor, varying in size from a hen's egg to a large orange, will be discovered on one side or other of the uterus; while the vagina will be found elongated, and the os uteri drawn upwards and towards the affected side. At the same period, an inspection of the abdomen discloses the existence of a certain amount of fulness on one side of the hypogastrium, or in one of the iliac regions. As the enlargement increases, the abdominal swelling becomes more symmetrical; so that when the tumor has reached the umbilicus, it is often somewhat difficult to decide whether one side of the abdomen presents any greater prominence than the other.

Many practitioners imagine that an ovarian tumor always occupies the side on which the disease is situated, while the pregnant uterus has its centre as constantly in the median line: neither of these propositions are absolutely correct. With respect to the *first*, it may be allowed that in many instances the most prominent side of the abdomen is that to which the diseased ovary belongs. But in the majority of cases, as before remarked, the tumor is centrally placed; while in some few it happens that the side opposite to the disease is the most prominent, owing to the morbid structures falling over to it. In unilocular cysts, too, the enlargement is always more even and rounded and symmetrical than in the multilocular varieties; so that the diagnosis between such cysts and ascites is frequently very difficult. As regards the *second* opinion, the exceptions to its truth are rare, though cases similar to the following show that they sometimes occur:

In the early part of April, 1858, I was consulted by a married lady, forty-one years of age, the mother of three or four children, who was supposed to be suffering from cystic disease of the right ovary. She was in a very bad state of health, the catamenia had long been irregular, and her youngest child was nine years old. The tumor occupied almost entirely the right inguinal and right lumbar regions, and communicated to the touch the sensation of a multilocular cyst, with gelatinous contents But on applying the stethoscope the fœtal heart was, after a little trouble, distinctly detected, beating at the rate of 130 a minute, while the maternal pulse was 90. As the fœtal pulsations were not audible to the gentlemen who met me in consultation, I am not sure that the diagnosis which was given was credited; but the truth of the opinion was proved by the patient's miscarrying at the end of the following month. The only reason which could be assigned for the unusual site of the uterus was that the lady had suffered from hemiplegia for a few years, and while confined to her bed had constantly rested on the back and right side; and so thoroughly, though gradually, had the uterus

become accustomed to its unusual situation, that no subsequent change of posture on the part of the patient affected its position.

A small ovarian tumor is more likely to be mistaken for a fibroid tumor growing from the side of the uterus, or for an abscess in the broad ligament, or for an extra-uterine gestation, than for the pregnant uterus. Yet the former may often be distinguished by the feeling of great elasticity, hardly amounting to fluctuation, communicated to the touch on making a vaginal examination; by the facility with which the sound can be passed into the uterine cavity, and the manner in which the uterus can be perceptibly moved away from the tumor, and independently of it; by the non-existence of those constitutional symptoms which arise from inflammation ending in suppuration; as well as by the absence of those inequalities of surface which are produced by the different parts of the fœtus. The history of each case, and the duration of the symptoms, will also afford material help in forming the diagnosis. I have, however, seen recent cases of ovarian dropsy where there has existed suppression or irregularity of the catamenia, morning nausea and vomiting, indigestion, troublesome constipation, irritability of the bladder, a sense of movement in the abdomen, and swelling with tenderness of the breasts.

The chief diagnostic marks of an ovarian tumor which has attained a large size are the following: The abdomen is found more or less completely occupied by the morbid growth; the enlargement being smooth and rounded without any prominences when the disease is of the unilocular variety, but often very uneven in the multilocular form. A practitioner has been known to confidently assert, that the limbs of a child could be distinctly felt through the parietes when there was only an ovarian tumor causing considerable inequality of surface. In the erect posture as well as in the supine, the tumor projects forwards, the flanks being comparatively undistended. In the multilocular, more commonly than in the unilocular tumor, the superficial veins coursing over the abdomen are found enlarged; while it has been thought by some observers that the vessels on the side corresponding to the diseased ovary are generally the most distended. This observation, however, I have not been able to confirm. Pressure with the hand on the tumor communicates a sensation of great resistance; this resistance being most

equable in the case of the unilocular disease, though it is almost the same in the multilocular tumor when there are large cells. Fluctuation is always very distinct when there is only one cyst; being of course more imperfect and obscure when there are several, and no single one of great size. Unless the morbid growth is very large and projects into the loins, or unless ascites coexists, fluctuation will not be detected in the flanks. The more viscid the contents of the cyst, the more obscure will be the fluctuation, as a general rule; and the same remark holds good when the cyst-walls are very thick. The pulsations of the aorta are sometimes communicated to the hand laid over the tumor. Percussion elicits a dull sound over the whole of the front and sides of the tumor, as a general rule. The exceptions are, when a coil of intestine passes between the growth and the abdominal wall, as it sometimes does just above the pubes; or when the cyst has been tapped, and has afterwards filled with air; or when a cyst has emptied itself into the intestine, and flatus has passed from the latter into the former. The dulness is uniform over the mass of the tumor, and its note is not affected by change in the posture of the patient. But there is resonance above the tumor; as well as in that lumbar region into which the intestines have been pushed, which is always the one corresponding to the healthy gland. By auscultation a murmur is sometimes heard in one or both iliac regions, owing to pressure exerted by the diseased mass upon the iliac arteries. Otherwise only information of a negative kind is gained; there being an absence of borborygmi, and of anything like the sounds produced by pregnancy. Cysts of moderate size, when free from adhesions, do not modify the respiratory movements; but when large they restrain the descent of the diaphragm, and especially do they do so when they are adherent. A non-adherent cyst will usually descend to the extent of an inch during inspiration. Dyspnœa and even orthopnœa are present when the tumor has acquired a large size. Some stress is laid by many authors upon the fact of the gradual emergence of the umbilicus during pregnancy, this emergence increasing until the depressed portion of the navel gets on a level with the integuments. But the same thing happens, even to a greater degree, in large ovarian tumors, as well as in ascites; and, in fact, in every case where the abdominal walls become greatly distended. Although in the early stages of ovarian dropsy the

patient will frequently be found in the enjoyment of good health, yet, as the distension increases, her constitutional powers gradually fail. At the end of no long period she complains of a bearing down and sense of weight in the pelvis; of flatulence, nausea, constipation, hemorrhoids, and throbbing in the fundament; and of a deepseated pain in the groins. She loses flesh and strength; the nights are restless; the appetite gets poor, and the power of digestion becomes impaired; and there is great mental depression. Then, by and by, there sets in œdema of the lower part of the abdomen, vulva, thighs, and legs; with numbness of the lower extremities, especially on the affected side. The case often terminates with more or less complete suppression of urine, from the pressure upon the kidneys, and uræmic poisoning; or there is increasing debility, which finally ends in exhaustion and death.

Dropsy of the Fallopian tube is rather an uncommon affection. The fimbriated extremity of this canal and the uterine orifice, occasionally get obliterated from the action of chronic inflammation. In such a case, the portion of the tube between the openings becomes the seat of a more or less abundant accumulation of pus or serous fiuid. Instances are recorded where an hypertrophied oviduct has alone weighed seven pounds, and has contained twenty-three pints of fluid. The positive diagnosis of this disease from a simple ovarian cyst is exceedingly difficult, if not generally impossible; but only an inexperienced observer could confound the abdominal enlargement produced in such a case with that due to pregnancy.

Acute inflammation of the ovary, ending in suppuration, is one of those rare diseases which could hardly be mistaken for pregnancy. The tumor formed by the abscess, however, may acquire a great size; a case having occurred to Kiwisch where the cyst contained fifteen pints of pus. Such instances must not be confounded with those cases of ovarian dropsy in which the contained fluid is formed almost entirely of pure pus; this secretion being the result of acute inflammation of the cyst-wall.

The fact that *pregnancy may coexist with ovarian dropsy* must not be forgotten; since it is a combination which will materially obscure the diagnosis. Many women have conceived and brought forth children after an ovarian tumor has manifested itself; and

several cases are known where the same has happened subsequent to the extirpation of the disease. When both ovaries are affected, pregnancy is, of course, much less probable, yet it has occurred; for there is no reason why we should not believe with Morgagni, that a woman may conceive if there only remain so much of one ovary sound as belongs to a single mature vesicle. Mr. Hewlett has recorded an extraordinary case in which a lady, with most extensive double ovarian disease, was delivered, after a very difficult and tedious labor, of a putrid child. She died ten days subsequently; and at the post-mortem examination it was found that both ovaries were converted into large malignant tumors. The left gland was so large that it ascended from the left iliac fossa to the diaphragm; while the right tumor entirely filled the hollow of the pelvis.[1] In the diagnosis of pregnancy under these circumstances, the points on which to rely for forming an opinion must be the history, the appearances in the mammary areolæ, the possibility perhaps of obtaining evidence by ballottement, and the audibility of the uterine murmur and fœtal heart. By inattention to these points ovariotomy has been performed, when in addition to the tumor there has been an undetected pregnancy; and in consequence abortion has followed the operation and proved fatal. In the succeeding case it will be seen, that by deferring the removal of the tumor until after the premature termination of pregnancy, the life of the patient was saved:

On the 5th of August, 1863, I saw Mrs. M. H. at the request of Sir William Fergusson. She stated that her age was 29, that she was married on 3d June, 1860, that she has been pregnant once, and that delivery took place on the 4th November, 1861. She suckled this child for eight months. Her size was so immense before delivery, that she suffered much from dyspnœa; and the distension was almost as great after labor. Six weeks subsequent to this event, her medical man tapped her. She went on for a year, and then was tapped a second time. This present year (1863) has been tapped five times; on the last occasion three months ago, when three gallons of a fluid like white of egg were removed. The catamenia have usually been regular; but the last day of their last appearance was the 10th March of this year. General health bad.

On examination, I found the abdomen as distended as at the full term of pregnancy. Fluctuation was everywhere distinct: dulness on percussion, except in the right loin where there was resonance. After a prolonged trial, I distinctly heard the sounds of the fœtal heart. By the vagina, the uterus

[1] Medico-Chirurgical Transactions, vol. xvii, p. 226. London, 1832.

could be felt enlarged. The opinion given to Sir William Fergusson was, that Mrs. H. had a multilocular tumor growing from the left ovary, and that she was five months advanced in pregnancy.

As the distension was great, it was determined that Mrs. H. should be tapped on the 7th August. But this proceeding was rendered unnecessary by her having a miscarriage the same morning. The fœtus was of five months growth. On the 28th October, Sir William Fergusson removed the tumor by abdominal section. The growth weighed 14 lbs. and sprang from the left ovary. The patient made a good recovery. Subsequently, she was delivered of a live eight months female infant on the 23d November, 1864. And again, on 18th December, 1865, she was delivered of twins; one child being healthy and well-formed, the other dead and malformed.

The fear of an ovarian cyst rupturing from the pressure exerted on it by the abdominal walls and the gradually increasing pregnant uterus must not be overlooked. There is likewise no little risk of the bloodvessels of the diseased ovary giving way, while the ovarian and uterine arteries are conveying an increased amount of blood under the influence of gestation. Should there appear a chance of either of these accidents occurring, it may be necessary to avert the danger by inducing premature labor. When the ovarian tumor consists of a single cyst, it will probably be worth while to resort to tapping instead of interfering with the course of gestation. The performance of ovariotomy during pregnancy is certainly unjustifiable. Abortion, and probably death, would be sure to result.

3. Ascites.—The signs and symptoms of this disease are generally so characteristic, that there would seem to be some difficulty in mistaking the abdominal enlargement which it produces for that due to any other cause. Yet errors in the diagnosis of ascites are far from uncommon. Especially is it sometimes perplexing to distinguish between a peritoneal dropsy and an ovarian tumor, when the latter consists of a singe capacious sac with thin walls. So again, in the case of a large uterus over-distended with an unusual quantity of liquor amnii and containing a dead fœtus, with some complication like ascites or a tumor of the liver, the diagnosis may be sufficiently intricate to try the skill of a shrewd observer. With regard to ordinary pregnancy and ascites, however, there ought to be no question. Nevertheless, cases similar to the following may perhaps occur even in the present day:

Francis Mauriceau relates that about the year 1654, being in the city of

Saumur, there was near his lodging a young and very handsome daughter of a citizen, who was five whole months under a physician's and apothecary's hands to be cured of a dropsy which she complained of. "At length after she had taken many violent remedies they had ordered her, she was cured in a moment, by bringing forth a child at its full time, notwithstanding all they had given her; which much astonished the physician and apothecary, to be so grossly deceived, in trusting to the maid's relation, who counterfeited the dropsy so well, that they could never perceive the truth till she was brought to bed."[1]

On examining a case of ascites in which the quantity of fluid effused is abundant, a general fulness of the abdomen can be noticed. If the patient be standing upright, the fulness will seem to be most prominent below the level of the umbilicus; but on lying down the abdomen always becomes more flat, while both the flanks bulge outwards. When placed on one side, the lowermost part distinctly exhibits the greatest prominence. Supposing the quantity of liquid to be excessive, there will be found to be general abdominal enlargement, uninfluenced by the posture assumed; while the abdomen will also appear to encroach considerably on the thorax, and the xiphoid cartilage with the cartilages of the lower ribs will be found much everted. The veins of the parietes are generally also prominent and dilated, a condition which is often due to obstruction of the vena portæ. When the dropsy is caused by structural disease of the liver, it is often associated with a certain amount of jaundice.

By practising palpation two or three very characteristic signs can be discovered. The great evenness of the enlargement, together with the feeling of resistance and weight which is experienced on pressing the hand towards the spine, will first excite attention. The elasticity of the swelling is remarkable. Then the evident sense of fluctuation communicated to the fingers arrests attention; the waves being finer and following more or less quickly upon the impulse, in proportion as the distension is great and the fluid of a thin serous or watery consistence. Œdema of the abdominal wall, or the presence of much fat, obscures this last sign.

On percussing over the higher portion of the belly, there is generally produced a resonant sound, owing to the floating of the intestines; although only dulness results if the distension be

[1] The Diseases of Women with Child, and in Child-bed. Translated from the French by Hugh Chamberlen, M.D. 7th edition, p. 19. London, 1736.

great and the breadth of the mesentery insufficient to allow the intestines to reach the surface of the fluid, or if the intestines have become matted together in consequence of peritoneal inflammation. By making the patient stand upright, we can trace the height to which the fluid reaches, and thus roughly estimate the quantity present; dulness existing over the part occupied by the effusion, and resonance above. If the patient be on her back, the resonant intestines are commonly found grouped around the umbilicus, while the flanks are dull. By placing the woman on one side, the uppermost flank is made resonant and the lowermost dull. In the differential diagnosis of ovarian dropsy, ascites, and pregnancy, one sign—percussion of the lumbo-lateral region—is worthy of recollection. If, in a case of ascites in which the distension is so great that the hydrostatic line of level is not changed by posture, the patient be made to sit up in bed, and the loins be percussed, it will be found that the note is the same—generally dull—on both sides. In the case of a large ovarian cyst, no matter how great the distension may be, we find that one loin will give out a clear note, while the other is quite dull. In the cases of far-advanced pregnancy which I have examined in the same way, I have found both loins resonant on percussion. The explanation is easy. In ascites, the air-containing intestines float as far forwards as their mesenteric attachment will permit; while in the case of an ovarian tumor the coils of gut are pushed over to the healthy side, and in pregnancy are forced backwards to either side indiscriminately. I have elsewhere remarked, that ordinarily when any real difficulty exists in the diagnosis of ascites from ovarian dropsy, the mere fact of difficulty may be taken as presumptive evidence in favor of the case being one of ascites. I do not at present remember having seen one instance where an ovarian tumor has been mistaken by a competent observer for a case of ascites; but I have known the opposite error often committed, even by gentlemen who have had considerable experience.

With regard to the general symptoms, a few words must suffice; since they of course differ materially, according to the cause of the disease. But in the advanced stages of dropsy of the peritoneum we shall find more or less dyspnœa, owing to the pushing upwards of the liver and spleen and stomach; while auscultation will show that the respiratory murmur cannot be heard so low as in health, that there is tubular breathing in the interscapular

regions and especially on the left side, and that the apex of the heart is elevated and rather pressed to the left. In many cases also there is general or partial œdema, the lower extremities being very often anasarcous; this being especially the case when there is renal disease. Moreover, in these instances the urine is usually scanty and albuminous. Generally, the uterus occupies its normal position; but owing to the pressure of the fluid, together perhaps with a relaxed condition of the vaginal walls, I have seen it displaced downwards, forming a considerable tumor between the upper part of the thighs.

Ascites and pregnancy may exist together, although the combination is not a frequent one. Very rarely it happens that impregnation occurs subsequently to the setting in of the dropsy. But much more commonly the pregnant uterus, at some period after the third month, induces the ascites; a pre-existing diseased condition of the liver, or of the right side of the heart obstructing the circulation, favoring its occurrence. Where ascites is conjoined with pregnancy, the abdomen becomes enormously distended as gestation advances. There is dulness on percussion, with more or less distinct fluctuation. The uterine enlargement can only be detected by making deep pressure with the fingers, while the patient is on her back; her head and chest being elevated and the knees drawn up, so as to relax the abdominal integuments. The signs of pregnancy are all obscured; the auscultatory phenomena, if detected at all, are muffled and indistinct, and only the detection of ballottement by a vaginal examination, together with the changes in the areola, make the diagnosis at all certain.

The general symptoms are distressing in the extreme. Great pain is complained of in the back and loins and thighs. There is œdema of the lower extremities. The renal secretion is scanty and high-colored, often loaded with urates of soda and ammonia, occasionally charged with bile, and sometimes containing albumen. There is urgent dyspnœa, increased by taking food or exercise. The countenance is livid, and bears an expression of much anxiety. Sickness, vomiting, constipation, headache, and palpitations increase the sufferings. There is an inability to move about; with such pain from difficult breathing on assuming the recumbent posture, that the patient is obliged to be con-

stantly propped up in bed. In short, so much severe general distress exists, that in order to give relief it is often necessary to remove the fluid by tapping through the abdominal wall; or it may be desirable to afford more permanent ease by inducing premature labor.

An excessive secretion of liquor amnii—*dropsy of the amnion*—has been described by several authors as sometimes obscuring the signs of pregnancy, and giving rise to several troublesome symptoms. The quantity of fluid has occasionally been large; sixteen pints, and even more, having come away on rupturing the membranes. The statements of obstetricians concerning the normal quantity of liquor amnii towards the end of gestation are very contradictory. Hunter, Lowder, Burns, and others assert that the average quantity varies from a pint to a quart. This opinion, however, seems to me to be incorrect; and I believe, with most Continental writers, that in the majority of cases there is not more than from twelve to sixteen ounces. When the quantity slightly exceeds a pint, the pains of labor may be found weak and inefficacious, owing to the distension of the uterine walls; although there may not have been any particular suffering during the last month of gestation. The presence of three or four pints, on the contrary, can give rise to so much positive distress during the last few weeks of pregnancy, that it may be absolutely necessary to afford relief by rupturing the membranes.

Different causes have been assigned for dropsy of the amnion. M. Mercier and others have generally attributed it to inflammation of the amnion alone. In by far the greater number of cases, however, which have been examined of late years, it has been noticed that there was an absence of anything like special inflammatory action in this membrane; though in almost all, some diseased condition of the entire involucra or of the placenta or of the fœtus existed, rendering the child incapable of supporting life after its birth.

The signs produced by an excessive secretion of liquor amnii are generally unequivocal. Thus, the uterus is always found considerably larger than in normal pregnancy; and hence it appears above the pubes, reaches the umbilicus, and so forth, at an earlier period than is customary. The uterine tumor is also tense, often more globular than usual, and smooth; its walls appear

thinner than in ordinary cases; while the fœtal limbs and movements are for the most part inappreciable. Fluctuation is more or less distinct, according to the extent to which the uterine and abdominal walls are attenuated; where this sign seems obscured, it may sometimes be detected more clearly by pressing steadily on the lower portion of the uterus with one or two fingers in the vagina, while percussing the abdomen. Moreover, on practising auscultation the uterine murmur can be heard distinctly, while the fœtal heart will be almost or quite inaudible. And then, an examination by the vagina will reveal to us an unusual degree of expansion of the inferior segment of the uterus; at the same time that we are able, with unusual ease and distinctness, to obtain ballottement.

The general symptoms consist chiefly of a sense of great discomfort, a feeling of tightness and distension, of inability to move about to any extent, and often of despondency. The patient believes that she is carrying twins. There are attacks of dyspnœa, aggravated by the recumbent posture. Complaint is made of constant pressure and weight in the pelvis; while there are frequent calls to evacuate the bladder, and occasionally attacks of tenesmus. Scarpa, Desormeaux, and Dr. Robert Lee have related instances where the diagnosis of this affection has been rendered unusually difficult by its being complicated with ascites. But even in simple cases of dropsy of the amnion mistakes have been committed. On one occasion, under the impression that the patient was laboring under ascites from disease of the liver, tapping was had recourse to. Had a correct view been taken, however, and the membranes been artificially ruptured, a cure would in all probability have resulted instead of death.

Advanced pregnancy is sometimes accompanied by great distension of the bladder, this viscus forming an oblong fluctuating tumor in front of the uterus. Independently of pregnancy, however, a distended bladder has been mistaken for ascites, for an ovarian cyst, for pelvic cellulitis, and for a fibroid tumor of the uterus; errors which may almost be said to be unpardonable. Not unfrequently too, pregnancy has been diagnosed when the enlargement has merely been due to an excessive accumulation of urine. Many physicians have seen cases like the following:

Sir Astley Cooper relates that Mr. Clive was called to a lady for a complaint which was thought to be dropsy of the abdomen; and which Mr. Clive at first conceived to be so himself. On examination, however, he observed that the upper part of the abdomen was more free from fluctuation than the lower; and it occurred to him that there might be some deception in the appearances, on account of a distended state of the bladder. On asking the lady whether she passed water freely, she replied in the affirmative; but, not feeling satisfied, he introduced the catheter, and drew off "an enormous quantity" of water, which had occasioned the appearance of dropsy.[1]

When a retention of urine takes place in the latter months of pregnancy, the bladder is unable to enlarge equally in all directions because of the resistance which it meets with posteriorly from the gravid uterus. Hence, as the urine accumulates, the vesical sac assumes a flattened form, and spreads upwards and laterally to a great extent over the anterior part of the uterus, at the same time giving under palpation such an evident sense of fluctuation, that the case might be mistaken for a dropsy. An unfortunate instance of this kind happened to a practitioner in Ireland, who tapped his patient for such a supposed dropsy; death being the consequence. On examination it appeared that the trocar and canula had passed through both sides of the bladder, through the anterior wall of the uterus, and even into the head of the child.[2]

Many other examples might be quoted to prove, that when examining the abdomen for the detection of pregnancy or for the purpose of deciding upon the nature of any kind of enlargement, care should be taken that the bladder is empty. It is useless trusting to the statements of the patient or her nurse; for they will often assert, in good faith, that the urine is being passed too freely, when in point of fact it is merely dribbling away from an over-distended bladder. The chief constitutional symptoms of an undue accumulation of urine are those of irritative fever. There is a hot clammy skin, a furred tongue, bearing-down pains, restlessness and sleeplessness, nervousness or despondency, a feeling of nausea, and sometimes actual sickness. The sense of bearing-down, together with the recurrrence of forcing pains at intervals, may even lead to the erroneous suspicion that the

[1] Lectures on Surgery. By Sir Astley Cooper, Bart., &c. Sixth Original Edition, p. 418. London, 1839.

[2] Lowder, MS. Lectures. Quoted by Dr. Gooch. Opus jam citat. P. 232. I have gone through the copy of Dr. Lowder's Lectures, written in 1782, belonging to the Royal Medico-Chirurgical Library, but cannot find this passage.

patient is in labor. There is one symptom, moreover, which I have seldom seen absent when the bladder has been distended for some forty-eight or sixty-four hours, and that is a rapid pulse —one varying from 96 to 120 beats in the minute. And it is often remarkable to witness how quickly these beats diminish in frequency when the cause of the disturbance is removed.

Seeing then the troublesome and very painful symptoms which may arise from retention of urine, and remembering the fatal consequences which must ensue if this condition be overlooked too long, I would advise the practitioner to be very wary. He should assure himself that a fair quantity of water is passed at proper intervals; instead of a few drops or a tablespoonful every ten or fifteen minutes. And most decidedly, if any doubt be entertained with regard to this matter, all uncertainty should immediately be set aside by the introduction of a catheter.

4. Fibroid Tumors of the Uterus.—Of all the organic diseases of the uterus which first manifest themselves during the period of sexual vigor, fibroid tumors are probably the most common. These growths may be developed in any portion of the uterus. According to their position they are often classified as subperitoneal or surface tumors, when seated just beneath the peritoneum; interstitial or intramural tumors, when imbedded in the uterine walls; and submucous or intra-uterine tumors, when they are pressed into the cavity of the womb. Fibroid tumors are met with at all ages after puberty, though they occur most frequently between the years of 25 and 48. The earliest age at which I have observed such a growth has been 18, the woman being married. It is very probable that these tumors occur equally in the married and single, in the sterile and fruitful. They may be solitary or numerous. In one large uterus which I removed from the body of an old woman, I counted as many as nine distinct outgrowths from the external walls of this organ; while there are specimens in museums where a greater number may be made out. These tumors vary in size from that of a bean, to an orange, or an infant's head; and occasionally they attain even a very much greater bulk, some having been found to weigh as heavy as thirty-nine or forty pounds. Waller, indeed, has mentioned one which weighed seventy-four pounds. In the year 1859, I had a patient under my care whose uterus was enlarged

by an oval and solid fibroid tumor, to at least a degree equal to that found at the full term of gestation. Though a woman of only ordinary stature, with the abdominal integuments very thin and tightly stretched, yet she measured seventeen and a half inches from the ensiform cartilage to the pubes; from the umbilicus to the pubes ten inches and a half; and in circumference midway between the umbilicus and pubes, thirty-seven inches and three-quarters. A distinct uterine souffle could be heard at different parts of the abdomen. It appeared almost certain that the morbid growth had become pediculated and therefore could have been removed, had it not been for the fact that its size was too great to allow of its entering the pelvic cavity; while an adhesion which it had contracted with the anterior wall of the uterus prevented a ligature being passed around its pedicle by the aid of Gooch's canulæ.

When the cavity of the womb becomes much enlarged by a fibroid projecting into it, the uterine walls get hypertrophied, while their sinuses may undergo development as in pregnancy. Under the influence of congestion—such as occurs at the menstrual periods—the walls of one or more of these venous canals are occasionally ruptured; blood being poured out until a coagulum forms, or the opening heals, or the uterine contractions compress the bleeding orifice against the tumor.

Fibroid tumors of the uterus are generally benign and harmless; many patients having been known to live for twenty, thirty, or even more years after they have first manifested themselves. Malignant fibroids are not, however, so very uncommon. The benign growths, although insensible in themselves, yet when projecting into the cavity of the womb are often very sensitive; this condition depending upon the irritability of the lining of the uterine cavity, which forms a covering to the tumor in its descent. Occasionally they thus become so painful as to prevent coition, and hence may be a cause of barrenness. If, in spite of the presence of one or more of these tumors in the cavity of the uterus, impregnation take place, the periods of pregnancy and labor are rendered unusually dangerous; the latter especially being liable to be followed by frightful hemorrhage, or severe metritis. Where the existence of one of these growths has complicated delivery or rendered it impossible, by its great size or its situation, recourse has been had to the Cæsarean section: an

operation which, in this country at least, is almost always fatal. Tumors seated in the walls or at the fundus may interfere neither with copulation nor gestation; though they may even in these situations, by impeding the expansion and growth of the uterine tissue, produce abortion.

Before proceeding to speak of the symptoms produced by these tumors, I shall briefly relate two cases where mistakes were made in their diagnosis. In the first instance the error was very excusable, as the following history shows:

A medical man was called up one night to attend, as he was told, a woman in labor. On his arrival he found the patient to be an unmarried lady, about forty years of age, and apparently very near delivery. There were the usual bearing-down pains recurring at intervals, and the ordinary uterine action. On examination he could not exactly determine what the presentation was, but imagined it to be the breech. He seated himself by the bedside, and supported the perineum in the usual manner. The labor gradually advanced, and at length delivery took place—to his great astonishment—of an enormous polypus, which was attached to the fundus of the uterus. He very properly cut off the tumor close to its attachment, and the patient quickly recovered.[1]

Dr. Bedford, of New York, records the second case,—that of a young lady who was afflicted with a large fibroid tumor of the uterus, which had been mistaken for pregnancy. When the Doctor saw her, she was dying of phthisis, possibly brought on by intense grief and disappointment. The chief points are as follows:

A gentleman of high standing in the Church of England had the misfortune to lose his wife while his only child was young in years. He became greatly attached to this daughter, and educated her himself; so that she was his fond pupil and constant companion. Soon after having attained her eighteenth year an attachment was formed between her and a young barrister of great promise; which attachment resulted in a matrimonial engagement. A few months afterwards her health began to decline; the menstrual periods became irregular, the abdomen and breasts enlarged, there was a marked change in her personal appearance, and she took a strong dislike to society; while at the same time she suffered from more or less constant nausea, loss of appetite, inability to sleep, and feverishness. These changes attracted the attention of some of her female acquaintance, and the rumor soon spread that they were the result of pregnancy. The man to whom she was affianced, hearing of these reports, addressed a letter to the father requesting to be released from his engagement; a proposal which was assented to without any hesitation. At the young lady's request a medical man was now called in; who, after an investigation of her symptoms, informed the father that she

[1] The Dublin Journal of Medical Science, vol. vi, p. 33. Dublin, 1835.

was undoubtedly pregnant, and advised that steps should instantly be taken to keep the unpleasant matter secret. The father indignantly spurned the proposal, and requested an additional opinion. A consultation was accordingly held, the result of which was a confirmation of the view previously expressed. Without delay the venerable and accomplished gentleman determined to resign his living, gather up his little property, and proceed with his daughter to America. On the passage out she became extremely ill; and there being a physician on board the vessel his advice was requested. After seeing the lady, who was then affected with excessive vomiting from sea-sickness, he told the father that there was danger of premature delivery. On Dr. Bedford examining the patient, he found that she was not pregnant, but was in the last stage of consumption. Four weeks afterwards she died; and at the post-mortem examination a large fibroid tumor was removed from the uterus.'

This sad case, in which probably both character and life were sacrificed by gross want of skill on the part of those whose aid had been invoked, shows the fearful responsibility which is not unfrequently thrown on the medical man, and the cruel result which may follow from his being rash or ignorant. Well might the broken-hearted father exclaim, as the tumor was removed from the womb. "This is my trophy, and I will return with it to England, and it shall confound the traducers of my child."

The symptoms produced by fibroid tumors are often neither prominent nor well-marked. Indeed, these growths not unfrequently exist without giving rise to a suspicion of the presence of any uterine disease. But on the other hand, when of a sufficient size to be detected through the abdominal wall, they are often the source of considerable disturbance. Thus, they may be the cause of menstrual irregularity; of a dull aching, or throbbing pain; of a sense of weight and bearing-down in the pelvis; of cramp or numbness in one or both thighs; of a difficulty in evacuating or in holding the urine; and of constipation, with hemorrhoids. Pediculated fibroid tumors—commonly known as uterine polypi—are almost always attended by one very prominent symptom, and that is hemorrhage; and with a little latitude the same remark applies to submucous tumors merely projecting into the cavity of the uterus. When the first symptom of the existence of a fibroid tumor is a sudden attack of hemorrhage, the patient not unfrequently tries to persuade herself that she has been pregnant, and aborted; and even though the flooding returns after

[1] Clinical Lectures on the Diseases of Women and Children. By G. S. Bedford, M.D., Professor of Obstetrics in the University of New York, &c. Fourth Edition, p. 50 New York, 1856.

a time, she still endeavors to deceive herself. The practitioner, however, must not be misled by her statements or opinions. He will distinguish the true nature of the disease by learning that the loss of blood has probably been excessive, and accompanied with coagula free from any pieces of membrane; that the hemorrhage has returned more than once without warning, and without being attended by uterine contractions or much pain; and especially that the tissue of the cervix is firm and the os thin and small, instead of being relaxed and swollen and patulous, as after abortion. Very frequently, especially with submucous tumors projecting into the cavity of the uterus, the patient first has her attention directed to the womb by noticing that the menstrual discharge is more abundant than usual, that its duration is greater, that it is attended with clots, and that its cessation is followed by leucorrhœa. The monthly periods also recur more frequently than is natural; the intervals between them gradually shortening, until at last there is scarcely more than a day or two of freedom. Moreover, the periods are accompanied with great pain in the back and thighs, and with bearing-down or dragging sensations; there may be expulsive efforts simulating labor pains, sometimes occurring only with the catamenial flow and sometimes coming on in the intervals with more or less frequency; and while the courses continue, and even for some few days before and afterwards, the patient is incapacitated from following her usual duties.

On making a vaginal examination we shall generally find the weight of the uterus increased, while its mobility is diminished; the vagina also being lessened in length. If the tumor be in the cavity, the os may sometimes be found patulous, and the tumor projecting between its lips. But more frequently the mouth of the uterus is closed, and the cervix absorbed into the substance of the walls; so that we feel merely a rounded body with a slight depression and opening at its lowest part. When the tumor occupies the posterior wall it often produces retroversion of the uterus; and consequently the fundus of this organ then lies upon the rectum, while the cervix is pushed forwards and upwards under the pubis. Supposing the growth to be in the anterior wall, the uterus will perhaps be anteverted; that is to say, with its fundus on the bladder and its os looking directly towards the sacrum. Instead of retroversion or anteversion, there may merely

be retroflexion or anteflexion; or there is sometimes more or less lateroversion or lateroflexion. And again, the tumors may even be large and heavy, without causing any uterine displacement whatever. Provided that the practitioner is certain of the non-existence of pregnancy, he will derive great assistance in forming a positive opinion on the nature of the growth from the use of the uterine sound. When this instrument is introduced into the healthy uterus, it passes for two inches and a half; and by it—without any rough manipulations—the organ can be elevated, or turned to either side, or bent backwards or forwards. In most instances of fibroid growth the cavity is found elongated; while if the tumor be in the walls or closely attached to them, the sound appears to enter the mass so completely that the uterus cannot be separated from it, both can be only moved simultaneously, and at the same time the womb is discovered to have lost its healthy mobility and freedom.

Whatever may be the cause of uterine enlargement—whether it be a tumor or retention of the catamenia—the breasts generally become somewhat developed and tumid; while sometimes the areola also darkens, or the follicles increase in size and number. But it is only in pregnancy that the nipples and the areolæ undergo all those peculiar changes which have been previously described; for in no other cases do we find, combined with the development of the glands, enlargement of the follicles and an increase in their number, œdema of the areolæ, moisture of these parts, and a gradually increasing deposit of pigment in their tissues.

If we practise auscultation over a fibroid tumor of the uterus we shall very frequently detect a souffle; which is synchronous with the pulse, and either short and abrupt, or harsh and prolonged. Firm pressure with the stethoscope, or a powerful contraction of the uterus, will possibly lessen or even suppress the sound. The souffle may possibly sometimes be due to the pressure of the growth on the aorta; but I believe it generally has its seat in the vessels of the enlarged uterus. This murmur might lead to the case being mistaken for pregnancy; but unless this condition coexist, we shall be unable to discover any sound resembling the fœtal heart, or anything which the practitioner can mistake for fœtal movements. When any solid body presses upon the aorta, the growth will transmit the sounds of this vessel; whether the solid be a fœtus, or an enlarged scirrhous

uterus, or a fibroid tumor, or a solid ovarian tumor. The sound may be single and systolic; or it may be double and synchronous with the double sounds of the heart.

Reference has already been made to the fact that these uterine tumors may coexist with pregnancy. It therefore becomes an important question how we may best discriminate such a complication. The only chance of avoiding error is by submitting the patient to a most careful examination,—by the abdomen as well as by the vagina; by thoroughly sifting the history of her symptoms; and then by fairly weighing and comparing the evidence obtained from these two sources. The details of the following case may perhaps serve as an example:

In October, 1855, a lady residing at Dalston consulted me about an abdominal tumor from which she had suffered for some months. She was thirty-five years of age, had been married six years, and had never been pregnant. The catamenia were regular. On examination I found a fibroid tumor, about the size of the fœtal head at the full term, growing in the anterior wall of the uterus. Under the use of the bromide of potassium and cod-liver oil, the general health improved; but the growth remained unaffected. On the 18th December, 1856, this lady again consulted me. The tumor had apparently very much increased in size, and now extended to midway between the ensiform cartilage and the umbilicus. But on examination, the growth struck me as presenting peculiarities which were not at first noticed. It was hard at its upper part, but very elastic in the middle and below; it was particularly even, and not at all nodulated; a loud uterine souffle could be heard to the left, on a level with the umbilicus; while on making a vaginal examination, the womb was found equably enlarged, the cervix soft and congested, and the lips of the os hypertrophied and cushiony. Moreover, the catamenia had not appeared since the month of July, though they had previously been regular; there was a distinct areola round each nipple, but no other very characteristic appearance; and none of the common general symptoms of pregnancy were complained of. Hoping that pregnancy existed, I was yet afraid to give an opinion; and requested her to see me again in a fortnight. On the 31st December, all doubts were set at rest by my hearing the fœtal heart. On the 19th April, 1857, I delivered her of a live female child, after a lingering labor; from which, however, she recovered without an unfavorable symptom.

The fear that these tumors may become greatly increased in size as pregnancy advances, and that they must be compressed and bruised during the process of parturition by the contractions of the powerful uterine fibres, has led some physicians to strongly recommend the induction of premature labor in all such instances. The late Dr. Ashwell was a great advocate for this proceeding. He believed that if such cases were left alone and the tumors

escaped mechanical injury, yet that they were liable to become softened during the latter months; that the increased supply of blood which they received led to inflammation, unhealthy suppuration becoming subsequently established in them; and that, as a consequence, death occurred soon after delivery. But the absolute correctness of Dr. Ashwell's views has not been confirmed by subsequent observers; although all practitioners allow that these complicated cases are serious, and require great care in their treatment. To lay down such a sweeping rule as that just mentioned is therefore unnecessary. But at the same time there can be no doubt that premature labor should be induced, if the tumor, from its size or position, be likely to prove any obstacle to delivery at the full term, or if there coexist any pelvic deformity. Moreover, it will always be advisable in every case to consider carefully whether such an operation be necessary; allowing the judgment free play, unoppressed by any bias one way or the other. In many instances these tumors have a tendency to produce abortion; but I have more than once found it advantageous to prevent this event rather than to encourage it.

5. Enlargements of the Liver, Kidneys, Spleen, &c.—To those who do not consider how strangely a disease will sometimes mimic a natural process, it must appear remarkable that *hypertrophy of the liver* could ever give rise to symptoms which would be attributed to pregnancy. Yet Mr. Ingleby mentions the case of a woman who died under a suspicion that she was pregnant; but in whom the great bulk of the liver, in conjunction with an effusion of serum into the pelvic cavity, gave the abdomen the appearance which led to error. The liver was found to weigh nearly sixteen pounds; the normal weight of this gland being between three and four pounds. Smellie saw a girl only twelve years of age, in the Marylebone workhouse, who was supposed to be in the eighth month of pregnancy. Several medical men had examined her, one of whom had offered to deliver her gratis; while others had made interest to be present at the accouchement. The case was even advertised, and the matron obtained money from numbers who went to see her; until the farce was concluded by the necessity for sending the patient to an hospital to be cured of her enlarged liver—the

source of the mistake.[1]—In 1841 Dr. Robert Lee visited in consultation, a married woman who was supposed to be not only pregnant, but in labor at the full period. The uterus, however, was in the unimpregnated state; the enlargement of the abdomen and the pain being due to hypertrophy and inflammation of the liver.[2]

Most of the hepatic diseases which present organic changes cognizable to the senses during life, are accompanied by enlargement. This of course varies in degree, according to the nature of the disease and its severity. In some disorders—such as congestion, simple hypertrophy, and fatty liver—the enlargement is seldom very great; and consequently there will merely be observed increased fulness beneath the ribs on the right side. But in other and more serious cases—as in the waxy or amyloid liver, cirrhosis with effusion, tropical abscess, cancer and hydatid tumor—the enlargement may be such that the gland will seem to occupy the entire abdomen. In disease of the right side of the chest, especially pleurisy with extensive effusion, the liver has been found depressed for some inches; thus causing an appearance as of abdominal tumor. Moreover, when in hepatic disease the enlargement is only moderate, the gland may yet be found much lower down than it ought to be in women who have been in the habit of wearing tightly-laced stays. Even in health, the compression thus exerted upon the lower part of the thorax will often force the anterior edge of the liver quite as low as the crest of the ilium; while, at the same time, the upper convex surface of the gland has been seen deeply indented by the pressure of the ribs.

In cases of enlargement when the patient is emaciated, the diagnosis will generally be found free from difficulty; particularly if the practitioner take note of the increased bulge of the lower ribs on the right side, of the situation of the free margin of the liver, of the persistence of dulness on percussion from the lower edge of the gland over the whole enlargement, and of the dilated veins on the exterior of the abdomen. But when the parietes are loaded with adipose tissue, and the viscera are filled with gas, it is not quite so easy to avoid error. Especial care must

[1] A Collection of Cases and Observations in Midwifery, by William Smellie, M.D. Fourth Edition. Vol. ii, p. 195. London, 1768.

[2] Lectures on the Theory and Practice of Midwifery, by Robert Lee, M.D., F.R.S., &c. P. 168. London, 1844.

then be taken to observe that none of the signs of pregnancy are present. It will be ascertained that the measurements of the right side of the abdomen exceed those of the left, unless the spleen be also simultaneously enlarged; that there is greater resistance to the hand on pressing over the right side than over the left, and that this increased resistance is continuous from the margin of the right ribs; that there is defective abdominal respiratory movement on the right side, owing to the impeded descent of the diaphragm, while the motion on the left is exaggerated; that the respiratory murmur on the left side of the chest is generally puerile; that the tumor has much less mobility than the gravid uterus; and that the enlarged liver seldom descends so very low but that some space exists between the edge of the gland and the upper margin of the pelvis, where resonance on percussion can be detected. In hepatitis which has gone on to suppuration, the constitutional disturbance—fever, shivering, pain, emaciation, &c.—will afford a clue; not to mention that when the abscess is large there is almost always a bulging or "pointing" in some situation corresponding with the situation of the liver. Malignant disease not unfrequently produces great general enlargement; though perhaps more commonly it gives rise to nodules or masses, which are numerous but small, and the projections of which are perceptible to the touch. Encephaloid growths, more generally than scirrhous, extend to the pelvis; but the general phenomena are such that the disease cannot be mistaken. Hydatid tumors are mostly globular or oval in shape, have an even and smooth surface, are very slow in their growth, have a high degree of elasticity, sometimes fluctuate, often transmit the aortic pulsations unless the patient be placed on the hands and knees, and possibly furnish the hydatid fremitus on practising auscultation. With respect to all the cases we have been considering, it is worth recollecting that the examination will be facilitated by taking care that the bladder is quite empty, and that the colon has been thoroughly evacuated by an enema.

The *kidneys* may occupy positions different from their normal ones, and this malposition is sometimes accompanied with great increase in size. Or, one renal organ will be in its natural position, and the other far removed from its ordinary site. Andral relates a case where one gland was in its natural situation, and

the other in the hypogastric region immediately over the bladder.—The two organs are now and then found united so as to form one body, giving rise to the so-called "horseshoe kidney." Such a gland was shown to the Pathological Society by Dr. Bence Jones. In this instance the crescent-shaped organ weighed twenty ounces; it was placed across the lower lumbar vertebræ, the inferior and convex margin being opposite the brim of the pelvis; it had two ureters, and the pelves with which the ureters were connected did not communicate; while on making a section no indication could be found that the organ had originally been formed by the fusion of two distinct kidneys.[1]—In rare cases the gland on one side is wanting, and then the one present is usually much enlarged.—Hydronephrosis, or dropsy of the kidney, gives rise to a tumor which may attain considerable size. The nature of such a tumor is often diagnosed with difficulty, more especially if the right gland be the one affected. But I do not know that such a tumor has been mistaken for the pregnant uterus; though it has certainly been diagnosed as a hydatid tumor of the liver, disease of the cæcum, an ovarian cyst, and as a tumor of the uterus.—Cancer of the kidney may proceed to such an extent that a very large growth results. In one case which I saw, the gland occupied the whole abdomen, was centrally placed, and was mistaken for an ovarian tumor. But in this instance the diagnosis was complicated by the coexistence of pregnancy, which ran its natural course. Three weeks after labor the patient died, and the left kidney was then found to weigh upwards of twenty-seven pounds.—Lastly, a movable kidney—the fact that one or both of the renal glands may be movable has been proved by examination after death—might be mistaken for a morbid growth. It could scarcely, however, be confounded by any medical man with a case of normal, or even of extra-uterine pregnancy; the situation of the gland, chiefly in one or other hypochondriac region, its form and size, and the absence of all constitutional disturbance or even inconvenience, sufficing to distinguish it. But that the movements of one of these kidneys may lead a woman to believe that she is pregnant, and that she feels the infant, is by no means impossible. In the year 1864, a patient, the mother of one child, was admitted into

[1] Transactions of the Pathological Society of London. Vol. vii, p. 264. London, 1856.

King's College Hospital. She not only thought herself in the family-way, but said she had distinctly felt the infant's movements. As, however, nine months had passed since she believed that pregnancy had commenced and there had been no delivery, she became frightened. On examination, the uterus was found empty; but both kidneys were movable, the right being more so than the left.

The *spleen* may attain such a size as to almost fill the abdomen; this condition occurring even in individuals who have never been away from a temperate climate. It is not very difficult to make a mistake as to the nature of the swelling. Occasionally, the combination of pregnancy with enlargement of the spleen has been observed. The diseased conditions which increase the volume of this organ are especially inflammation, fibrinous deposits, simple hypertrophy, lardaceous or amyloid degeneration, tubercular growths, cancer, and cysts of various kinds. This gland may become so hypertrophied as to weigh from two or three to eighteen pounds; and instances are recorded where it has been found as heavy as forty pounds. In the examination of these cases reliance must chiefly be placed on the detection of the thin anterior edge of the organ, and its notched condition; on the smooth convex surface of the swelling; on its mobility, and superficial character; on its seldom occupying as much of the right side as of the left; and possibly on the presence of the "splenic murmur." Then the connection of the tumor with special constitutional symptoms—such as ague, leucocythemia, or typhus fever—will usually show the exact character of the disease. But in proof that erroneous opinions may be formed, the following is quoted:

Stella, an African slave, aged forty, the mother of four children, was led to consider herself with child in April, 1831, in consequence of the interruption of the catamenia, and the presence of other indications of pregnancy. She continued to follow her usual avocation as a field-hand until the close of the year; when the gradually increasing size of the abdomen, the œdematous condition of the lower extremities, and more especially the absence of all internal motion, induced her master to look upon it as a dropsical affection. In January, 1832, she was examined by Dr. W. M. Lee, who found the abdomen fully as large as at the expiration of the usual term of pregnancy; and who diagnosed the disease as scirrhus of the left ovary. In April of the same year she died; and it was then discovered at the autopsy that the enlargement was due to the hypertrophied spleen. This organ, when removed, was found to measure twenty-seven inches in its longitudinal cir-

cumference, sixteen inches and three-quarters in its transverse circumference, and to weigh five pounds and a half.[1]

Mr. Ingleby also mentions that he once opened the body of a woman who had been pronounced to be in a state of pregnancy; but the enlargement was ascertained to depend upon a diseased spleen, which weighed nine pounds.

A tubercular condition of the peritoneum might mislead if only an imperfect examination were trusted to. Mr. Ingleby says that he met two practitioners in consultation upon the case of a middle-aged unmarried woman, whose abdomen had become very evenly and progressively distended until it closely resembled the gravid uterus at the seventh month. The body of the uterus was found distinctly enlarged, and the woman believed herself to be pregnant. Amenorrhœa had followed indulgence in sexual intercourse. The general health had gradually declined. The patient died. On examination, the enlargement was found to consist of a tuberculated condition of the peritoneum at every part, but particularly of that portion covering the uterus. Notwithstanding the external evenness of the abdomen, the whole serous membrane was studded with tubercles, varying in size from mere granules to a large walnut.

Dr. Robert Lee records the following case:

A young woman who resided in a family at Bayswater was attacked with tuberculated disease of the peritoneum and omentum. The abdomen enlarged so much, that pregnancy was suspected; and the medical attendant of the family was requested to see her, and ascertain if such was the case. He reported that she was in an advanced stage of pregnancy; and consequently she was compelled immediately to quit her situation in disgrace. She obtained, by some means, a letter of admission into St. George's Hospital. There Dr. Robert Lee was requested to see her, to ascertain if the enlargement of the abdomen arose from pregnancy. The abdomen was as large as it usually is at the commencement of the ninth month: there were white lines on its sides, and the navel protruded. No movements were felt indicative of pregnancy, nor was any sound heard by auscultation. The mammæ were shrunk, and there were no areolæ. The uterus was found on examination to be pressed down close to the outlet of the pelvis by a great mass of disease above, which was thought to be probably of the nature of an ovarian tumor. At all events, Dr. Lee seems to have convinced himself that there was no pregnancy.

Even after this examination, Dr. Lee was requested a second time to look

[1] The American Journal of the Medical Sciences, vol. xii, p. 383. Philadelphia, 1833.

at the case, so as to be sure that there was no mistake. The diagnosis was correct. She died in the midst of great agony, in the course of a few weeks. At the autopsy, the cause of enlargement was revealed. There were immense masses of tuberculated accretions found occupying the whole sac of the peritoneum and omentum.[1]

Fecal accumulations occur at any portion of the colon, or they may be distributed through the lower part of the small intestines and the whole of the large gut. Generally, however, they are found in the cæcum, or in the sigmoid flexure of the colon, or in the rectum. When the accumulation is large and conjoined with a flatulent state of the small intestines, the abdomen will be found very greatly increased in all its measurements. An inordinately large stercoral tumor has more than once given rise to a suspicion of pregnancy. I have seen an instance of this kind in which the woman was certainly as bulky as at the seventh month of gestation; the cause of the increase in size having been overlooked by more than one practitioner, simply because on inquiry the bowels were stated to be relaxed. But the fact was, that the rectum and a portion of the colon were completely choked by hardened fæces; a channel having been formed through the mass to allow of a slight escape. The persevering use of warm purgative enemata soon removed all doubt as to the nature of the case; but though the patient ultimately recovered, it was a long time before the intestinal coats regained their normal tone.

The following affords also a good example of a stercoral tumor being mistaken for pregnancy:

Madame L., forty-eight years of age, in good health, with the menses irregular and appearing only at long intervals, consulted her physician respecting a swelling which had appeared and was increasing in the hypogastrium. Pregnancy was diagnosed. But at the end of nine months nothing made its appearance; while the tumor continued gradually, but slowly, to increase in size. When M. Laronde was called in, the patient was despaired of by her attendants. He found her condition as follows: Pulse small and weak, decubitus dorsal; prostration very great; face pale, emaciated, and characteristic of a chronic affection of the intestinal canal; breath fetid; gums soft and bleeding; while there was an abdominal tumor extending as high as the umbilicus, hard and rounded, which instead of rising from the sides, seemed intimately connected with them. The tumor felt like a mass of half dried earth or clay. The patient went to stool once or twice daily, and occasionally she was troubled with diarrhœa. Glauber's salts, &c., were admin-

[1] Lectures on the Theory and Practice of Midwifery, p. 168. London, 1844.

istered; an immense quantity of fecal matter was discharged; and the tumor disappeared.[1]

A case of enteritis, with retention of fæces, simulating pregnancy and labor, has been put on record by M. Barbieri, a surgeon in Fifeshire:

The patient was thirty-two years of age, rather stout, and the mother of two children. Pains like those of labor set in on the morning of the 16th December, 1840, and recurred every five minutes. In answer to various questions, she said that the catamenia had been absent for nine months and two days; she had quickened at the end of four months and a half; the motions of the fœtus had become progressively stronger every month; she had experienced morning sickness, heartburn, longings, dysuria, cramps, frightful dreams; and for the last two months had been troubled with varicose veins, as well as anasarca of the legs. Just before the doctor's arrival the liquor amnii—it was said—had been discharged; and at the time there was a slight sanguineous flow. After a careful examination it was found that pregnancy did not exist; and the presence of enteritis, complicated perhaps with Bright's disease of the kidney, was diagnosed. The treatment adopted was *rather* active. A dose of castor oil prepared the way for more powerful measures. Sixty-four ounces of blood were then abstracted from a large orifice: in ten minutes "profound syncope and collapse followed, which continued nearly a quarter of an hour, accompanied by an incredible amount of liquid fæces," filling at least four large chamber urinals. Three grains of opium and eight of calomel were next administered. "She was now necessarily left for eight hours, owing to an obstetric engagement." At the end of this time the treatment was renewed. As the urine was albuminous, she was again bled to thirty-two ounces; forty leeches were applied to the ilio-cæcal region, and the hip-bath used when they fell of; a blister was put over the whole abdomen, the sore being afterwards dressed with strong mercurial ointment; and she had two grains of calomel with a quarter of a grain of opium every four hours. When the intestinal inflammation was subdued, on the third day, acute gastritis set in, and "notwithstanding the most energetic local treatment," the poor lady died on the sixth day "of the acute attack."[2]

It is quite unnecessary, and might be injudicious, to weaken the effect of the foregoing facts—which are obviously published for our instruction—by any comments; for though we may agree with the author that the case "is one of extreme interest," yet it presents other features which it would be uncharitable to characterize in words such as they deserve.

Mr. Roberton relates a case in which a very large *ventral omental hernia, complicated with abdominal dropsy*, was mistaken

[1] Journal de Médecine et de Chirurgie Pratique. Paris, Novembre, 1840.

[2] The London and Edinburgh Monthly Journal of Medical Science, vol. iv, p. 185. London and Edinburgh, 1844.

by several medical men for extra-uterine pregnancy. Briefly stated, the facts are as follows:

A patient with an enlargement of the abdomen consulted Mr. Roberton in the year 1839. Twenty-two years previously, a surgeon had made an exploratory opening into the tumor, and the skull of the fœtus (as the operator declared) had been felt. The tumor was situated on the left of the median line; but as the patient was stout, it was not easy to determine its size. The protuberance was firmer to the touch than the surrounding parietes; while from the most depending part, just above the pubes, hung a pouch-like tumor, the size of a melon, which it was evident contained fluid. A hard substance was also felt, which the imagination had regarded as the cylindrical bones of a fœtus. Five years afterwards the lady died. At the post-mortem inspection the following was found: About two inches below the umbilicus, and a little to the left side, was a loose shrivelled sac, apparently empty. By making a semicircular incision into the abdomen, so that, when the flap was turned down, the sac could be viewed from the inside, there was discovered an opening into it that would admit three fingers; through which opening passed a longish protrusion of the omentum, about the thickness of a finger, and which adhered at its extremity to the upper fore-part of the sac. The sac itself would have contained an ordinary-sized fist. The uterus with its appendages, the bladder, and all the pelvic viscera, were quite healthy and *in situ*. It was clear that the substance which the operator had mistaken for the fœtal skull consisted of a mass of indurated omentum.[1]

Encysted dropsy of the peritoneum, in which a cyst containing fluid is formed between the parietes of the abdomen and this serous membrane, could scarcely be mistaken for pregnancy. Still the occasional occurrence of such a disease may be advantageously remembered; more especially as it would seem to be more frequent in women than in men. Of twenty-six examples referred to by Lieutaud, twenty-four occurred in females. The disease with which it has generally been confounded, when in an advanced stage, is ascites; but it may be usually distinguished by noting the absence of constitutional disturbance, and the less uniform enlargement of the abdomen.

Very large cysts occasionally, though rarely, form in the folds of the omentum, or on the under surface of the liver, or under the posterior part of the peritoneum; and though quite unconnected with the ovaria, yet they have been found to contain the products of certain ovarian tumors, viz., fat, hair, bone, &c. The following very good example of a cystic tumor existing under the

[1] Essays and Notes on the Physiology and Diseases of Women, and on Practical Midwifery, p. 431. London, 1851.

peritoneum, and presenting during life all the appearances of ovarian dropsy, has been recorded by Mr. Lee:

Mrs. ——, ætat. 50, married, had been laboring under a tumor of the abdomen for twenty-five years. She had had one child previously to its appearance, and three since; and she suffered by the disease in nothing but its bulk, up to the last being able to amuse herself with her household duties. The tumor was of an enormous size, disturbing the breathing, and at last producing fatal symptoms. On an examination after death, the cavity of the abdomen was found almost entirely filled by an enormous tumor, which pushed up the viscera to the right side, and compressed the spleen posteriorly. It was seen to have commenced on the left side, just under the pancreas, *but below the peritoneum*, so that it rested upon the posterior muscular walling of the abdomen. A narrow pedicle, six inches long, of the size of a quill, connected it with the uterus. It had also formed connections with the other viscera of the abdomen. The cyst itself contained two pailfuls of a turbid whitish-colored fluid, with an immense number of balls of hair mixed with fat, in which was calcareous matter: no hairs were observed attached to the cyst, but the balls of hair, fat and osseous deposit were as large as the closed hand. On the left side of the cyst was attached a mass of bone, teeth, &c., strongly resembling an imperfect fœtus. This body was about four inches long, and covered by a membrane resembling the true skin, but closely connected with the sac. It presented at its upper portion an opening divided into two parts, like the imperfect nostrils, immediately under which was a large bone, like the lower maxilla, filled with teeth; on each side of this part projected a small appendage resembling the ear; and below this mass, were two long appendages like abortive arms, the right one being the smallest, and composed of skin, at the end of which were a few hairs. The left appendage was larger, still more closely resembled the arm, and was apparently jointed at the shoulder and elbow; it contained one strong bone like the humerus, and two small bones for the fore-arm. At the lower extremity of the body of this mass was a large projecting bone, also jointed. This approached the form of a femur, at the lower extremity of which was an irregular osseous deposit.[1]

This case shows very strikingly that these formations of teeth, bone, &c., in certain tumors, are in no way connected with the functions of generation in the individual presenting them; but proves that they are coeval with her in whose body they are found, being due to the original inclusion of one germ within another. In other words, two ova are impregnated, though only one reaches maturity; the other being arrested in its development at an early stage, but becoming adherent to the body of the healthy fœtus, in which it is found after birth in the form of a tumor. The same explanation applies to those cases where

[1] On Tumors of the Uterus and its Appendages, by Thomas Safford Lee, M.R.C.S E., &c., p. 124. London, 1847.

hair, teeth, bones, &c., have been discovered within the one or other of the ovaria of girls, where impregnation has not, and could not have taken place; as well as to those scarcely more curious instances in which fœtuses have been found in the bodies of boys, examples of which have been recorded by Messrs. Young, Highmore, and Dupuytren.[1]

It is by no means an uncommon circumstance to find, in the egg of the common fowl, two yolks, in one shell. But a remarkable example of a perfect ovum in ovo has been described by Dr. Barnes. In this case, a pullet, half-bred between a Cochin and a Dorking, laid about one egg daily for six weeks; during which time nine eggs were found to be double. The specimen examined exhibited an inner perfect egg, of the size usually laid by an ordinary pullet; this egg being contained in a larger one, resembling that always produced by a Dorking fowl. The two shells were not adherent; the inner one being surrounded by the albumen of the larger egg, the yolk of which was in the big end somewhat compressed.[2] Two somewhat similar cases are also reported; one having occurred in the egg of a Muscovy duck.[3]

6. Hæmatometra, Hydrometra, and Physometra.—Distension of the uterine cavity from retained menstrual blood—*hæmatometra*, as it is technically called—may give rise to signs which might lead to a suspicion of the existence of pregnancy, or of some disease of the uterine or abdominal organs. This condition may arise from either congenital or acquired obstruction of the vulvo-uterine canal; such as a tough imperforate hymen, closure of the orifice of the vulva owing to an attack of inflammation, malformation of the vagina, or occlusion of the os uteri. Under any of these circumstances the menstrual fluid gradually collects

[1] Medico-Chirurgical Transactions, vol. i, p. 236. Third Edition. London, 1815. The paper was read before the Society by Mr. Young, 16th March, 1808.—See also, The Case of a Fœtus found in the Abdomen of a Young Man at Sherborne, Dorsetshire. By Nathaniel Highmore, LL.D. London, 1815. The preparation described in this work is in the Museum of the Royal College of Surgeons of England.—Also, Dissertation sur le Fœtus trouvé, a Verneuil, dans le Corps d'un Enfant Mâle. Par Verdier-Heurtin. Paris, 1804. This is the case generally referred to as Dupuytren's, who, however, only made a report upon it. The report is published in the Bulletins de la Faculté de Médecine de Paris, et de la Société établie dans son sein. Tome premier, p. 4. Paris, 1812. And lastly, "Geburtsgeschichte und Untersuchung eines Falles von Fœtus in fœtu." By Dr. Breslau and Dr. Eduard Rindfleisch. Virchow's Archiv für Pathologische Anatomie und Physiologie und für klinische Medicin. Band 30, p. 406. Berlin, 1864.

[2] Transactions of the Obstetrical Society of London. Vol. iv, p. 87. London, 1863.

[3] Hardwicke's Science Gossip. No. 26, pp. 46, 47. London, February, 1867.

in, and soon distends, the uterine cavity; the walls of which generally become hypertrophied. In a case of imperforate os uteri with retention of the menses, about which I was consulted, the abdomen was quite as large as at the sixth month of gestation; my opinion being sought for the purpose of determining whether the enlargement was due to pregnancy or to an ovarian tumor. As will appear, however, there was no difficulty in forming a correct diagnosis. The chief points to which my attention was directed were these:

A young woman, twenty years of age, had never menstruated. She had been in very delicate health for nearly four years. The particular reason for seeking advice was on account of abdominal enlargement, which had been perceptibly increasing for nearly three years; during which time she had suffered very frequently from nausea and constipation, from constant aching in the back, and at intervals of about a month from severe bearing-down and other dysmenorrhœic pains. A careful investigation was made. The oval and even shape of the tumor seemed to show that it was the uterus; there was dulness on percussion over its surface; and an indistinct sense of fluctuation was communicated to the touch. Examining per vaginam, the body of the uterus was found enlarged, and the cervix obliterated; while there was also a complete absence of the lips, and merely a slight depression where the os should have been, but not the smallest opening. Subsequently, the passage of a curved trocar into the cavity of the uterus confirmed the diagnosis which was made, that the condition was one of retained menstrual fluid. The operation permitted the escape of about three pints of a thick viscid fluid, somewhat resembling treacle, which possessed a slightly fetid odor. The tumor of course disappeared; and the subsequent careful dilatation of the opening with small sponge tents effected a permanent cure.

It must be remembered that retention of the menses may not only occur in women who have never had any external manifestation of the catamenial flow, but also in those who have even borne children. Thus, the lips of the os uteri have suffered from adhesive inflammation, owing to the improper employment of caustics; or to the careless use of instruments during labor; or to some blow or accident; or to the criminal introduction of probes, pieces of whalebone, &c., to induce abortion. Instances are known where attempts to destroy the product of conception in the manner just mentioned have failed in their object, and yet have produced so much mischief that ulceration and adhesion of the labia uteri have followed. In such, when the pains of labor have come on, there has been of course no outlet for the child; and unless an opening has been made at the site of the os, the uterus has either ruptured, or the woman has died undelivered.

It will very rarely happen that the opposite error to the one just treated of can be committed—viz., the mistaking the enlargement of pregnancy for that due to the retention of the menses. Yet the following history will show that such is possible:

Some years since, Professor Rossi was hurriedly sent for by a married woman, who had been attacked with violent abdominal pains. On examination, he found that the external organs of generation were entirely wanting, there being no hair upon the mons veneris, and no signs of puberty. He dismissed the idea of pregnancy from his mind, and attributed the pains to the absence of any passage for the discharge of the menses; and therefore determined at once to let out the catamenial fluid by making an incision three inches long in the direction of the vagina. On introducing his finger, however, through the opening thus made, he ascertained that the woman was really in labor; so that by enlarging the incision, she was delivered quickly of a male fœtus. On subsequently instituting a more careful examination, M. Rossi discovered near the sphincter ani a minute opening, which would scarcely admit a very fine probe; and this orifice was found to communicate with the passage made by the knife.[1]

The collection of a thin serous or watery fluid—*hydrometra*—in the uterus, or of pus—*pyometra*—in the same situation, may give rise to an erroneous diagnosis; particularly if the accumulation should amount to several ounces. The degree of enlargement of the uterus, and the fulness of the hypogastric region, will of course vary according to the length of time that the cervix has been blocked up, or the os completely closed; as well as upon the circumstance of the mucous membrane of the body of the uterus being healthy, or affected with a kind of chronic catarrh causing its natural secretion to become much increased in quantity. Moreover, unless the climacteric period has been passed, or unless there is perfect amenorrhœa, hydrometra must become complicated with hæmatometra; and then the fluids retained have amounted to many pints. A case is described by Vesalius,[2] in which the uterus was found to contain one hundred and eighty pints of watery fluid, the edges of the os uteri being firmly adherent. Ploucquet[3] also gives references to several other examples; but the most recent characteristic instance which I know of has been published by Dr. Anthony Todd Thomson. The chief points of medical interest are as follows:

[1] Memorie della Reale Acad. delle Sc. di Torino. Tomo xxx. I am only acquainted with this case from finding it quoted in The American Journal of the Medical Sciences, vol. i, p. 434. Philadelphia, 1828.

[2] De Humani Corporis Fabrica. Liber v, cap. 9, p. 627. Basil, 1543.

[3] Literatura Medica Digesta, sive Repertorium Medicinæ Practicæ, Chirurgiæ, atque rei Obstetricæ. Tomus ii, p. 383. Tubingæ, 1808.

A widow, sixty-five years of age, of intemperate habits, the mother of two children, was admitted into the infirmary of the Chelsea workhouse in December, 1823. Nine or ten months previously she first noticed an enlargement of the lower part of the abdomen, but had no advice for it. On examination a tumor was found, rising as it were out of the pelvis, and occupying the iliac, hypogastric, and umbilical regions. She appeared as large as if six months gone with child; an indistinct fluctuation was perceptible, and the least pressure on the tumor excited pain. The disease was regarded as a dropsical ovarium. In January, 1824, the left foot was found to be affected with dry gangrene; and in the following month the limb was amputated. On the third day afterwards the patient sank and died. At the post-mortem examination, on dividing the abdominal parietes, a body resembling closely the gravid uterus was seen occupying the whole of the pelvic cavity, and the greater part of the abdominal. On its anterior surface, and firmly adhering to it, was the urinary bladder, which was found to extend to within an inch of the umbilicus; so that it must have been perforated, if the trocar had been employed under the supposition that the disease was ovarian dropsy. The tumor was at once ascertained to be the uterus; which was greatly enlarged and filled with eight quarts of a dark brown-colored albuminous fluid. The existence of a large hydatid was suspected; but this opinion was incorrect, for the sac consisted merely of the uterus, in the cavity of which the fluid was contained. The internal surface of the organ was not more irregular nor more spongy than in its natural state, but none of the orifices could be found, for even the os uteri was interiorly as completely obliterated as if it had never existed; and although its situation could be traced in the vagina, yet even there it was very faintly marked.[1]

There is a peculiar disease of the follicles of the cervix, which has been described as *hydrorrhœa uteri;* and which, if unknown, is not unlikely to be mistaken for hydrometra. The distinction, however, is easy; for in the former, as there is no obstruction, so no tumor is formed. Indeed, the only symptoms consist in the continual escape of a thin serous fluid, often in considerable quantity; and a depressing feverish condition of the system, with more or less pain in the loins. Hydrorrhœa uteri is not a common affection; it affects both the unimpregnated and the gravid uterus; and it depends upon a sort of catarrh, or excessive activity of the follicular structure of the cervix. In cancer of the uterus there is also very generally an abundant watery discharge; but the cause of this is at once made apparent on instituting an examination by the vagina.

The accumulation of gas in the uterus—*physometra*—although a very rare affection, and one that not a few eminent obstetricians have thought impossible, is still no fictitious disease. In exten-

[1] Medico-Chirurgical Transactions. Vol. xiii, p. 170. London, 1827.

sive tympanites of the uterus the abdomen is found rather enlarged. Just above the pubes, and extending upwards through the hypogastric region to a slight degree, an ovoid and non-fluctuating tumor may be discovered; on percussing over which uniform resonance is elicited. Then, on making a vaginal examination, the uterus will be detected dilated and elastic; occasionally it is retroflexed, or retro- or anteverted; while sometimes its lower orifice is closed. The passage of the uterine sound will open the os uteri, permit of the escape of the gas, and so cause a subsidence of the tumor. Sometimes the gas is expelled involuntarily, much to the patient's discomfort; the air evacuations taking place rapidly and frequently, with violence, and with a peculiar explosive noise. The gas is inodorous, unless it has been generated in utero by the decomposition of a portion of retained placenta, or by a putrefying ovum or clot of blood.

The accumulation of air in the vagina is a much more common occurrence than the foregoing. In not a few cases the air rushes into the vaginal cavity directly the labia are separated for making an examination; so that on passing the finger onwards, it seems as if it were in the centre of a hollow ball. It is easy to imagine, that with a patulous os and a relaxed condition of the uterine walls, the air may be sucked up into the cavity of the womb from the vagina, and thus constitute a case of physometra.

At a meeting of the Obstetrical Society of Edinburgh, in 1856, Dr. Keiller stated that he had seen several cases of physometra. His conviction was, that although the gas might be in some instances directly exhaled from morbid uterine or vaginal secretions, and then afterwards become suddenly expelled, yet that this explanation would not apply generally. On the contrary, he believed that the air was not evolved in the uterus or vagina previous to its expulsion, but that it was first received from without, and then subsequently expelled; the ingress, retention, and subsequent explosive egress of atmospheric air constituting the essential character of the infirmity. The suction-like action of the levatores ani and abdominal muscles on the walls of the vagina, thus occasionally leads to the presence of air in the uterine passages; where the gas quietly accumulates, until the parts become distended, and cause its involuntary expulsion.

CHAPTER IV.

THE DURATION OF PREGNANCY.

CONTRADICTORY VIEWS ENTERTAINED ON THE SUBJECT—ORDINARY DURATION OF PREGNANCY TEN LUNAR MONTHS—THE EXCITING CAUSE OF PARTURITION—OUR IGNORANCE OF THE INTERVAL WHICH ELAPSES BETWEEN INTERCOURSE AND THE ACTUAL VIVIFICATION OF THE OVULE—TABLES OF CASES BY DRS. MERRIMAN, REID, MURPHY, AND THE AUTHOR—FORTY-FIVE CASES OF CONCEPTION, THE DATES BEING CALCULATED FROM A SINGLE COITUS—M. TESSEIR'S RESEARCHES ON COWS, MARES, ETC.—EARL SPENCER'S OBSERVATIONS ON THE TIME OF GESTATION IN 764 COWS—TO WHAT EXTENT MAY PREGNANCY BE PROLONGED BEYOND THE NORMAL PERIOD?—PROTRACTED PARTURITION SAID TO BE SOMETIMES MISTAKEN FOR PROTRACTED GESTATION—VERY SCANTY SATISFACTORY EVIDENCE THAT PREGNANCY, IN THE HUMAN SUBJECT, HAS EVER BEEN PROLONGED BEYOND TEN CALENDAR MONTHS—MODE OF CALCULATING THE DATE OF LABOR.

A PERUSAL of the medical evidence which has been given in various courts of law, as to the duration of pregnancy, can only excite the reader's astonishment. For not only are the very positive statements of different physicians in different countries quite contradictory, but in no one kingdom does it seem possible to bring together a score of practitioners whose views on this subject shall be in exact accordance. It might almost have been thought that the subject was one which the most ancient fathers of medicine would have discussed, and finally agreed upon; and that writers in succeeding ages would have had nought to do but to quote from black-letter volumes. This is far from being the case, however; though the question has been the theme of many an interesting essay, and the matter of frequent discussion, particularly since the occurrence of the Gardner Peerage Cause, in 1825.[1] But society at large is so deeply interested in the correct

[1] The chief medical interest in this trial was owing to the following points: In 1802, Lord Alan Hyde Gardner, captain of H. M. ship Resolution, arrived off Portsmouth, and was joined by his wife, Mrs. Gardner. She remained on board for three weeks, leaving for London on the 30th January; but the Resolution did not sail for the West Indies until the 7th February, and in the meantime communications were kept up between the ship and the shore. Lord Gardner returned home on the 11th July, of the same year. Mrs. Gardner bore a son on the 8th December, 1802, which appeared to be the fruit of an illicit intercourse between her and Mr. Henry Jadis. Lord Gardner succeeded in obtaining one thousand pounds damages, and a divorce; whereupon he married again, and

settlement of this *questio vexata*, that it would certainly long since have been decided, and the truth extracted from the mass of conflicting evidence surrounding it, were it not that the opportunities for obtaining correct data are really much fewer than might seem to be the case at first sight. It has been aptly observed, that "as it is difficult to conceal the termination of pregnancy, so is it equally difficult to ascertain its commencement;" and with regard to civilized life, at least, this is no exaggeration. From married women the information required can seldom be obtained; while in the case of single females so many motives for the practice of deception exist, that their testimony has to be received with the greatest caution.

It is on all hands admitted as certain, that the ordinary duration of pregnancy in the human subject is ten lunar months, or about nine calendar months, or forty weeks, or from two hundred and seventy-four to two hundred and eighty days. But the point which has to be solved is this,—may not gestation be protracted beyond this time, without the infringement of any law? It must be summarily replied, that from all which can be ascertained on the subject by the study of recorded cases; from all reasoning by analogy, for it has never been denied that the periods of dentition, puberty, the cessation of the catamenia, &c., are each liable to vary within certain limits; and from all arguments adduced from comparative parturition—for we know that, to a certain extent, the period of gestation is not precise among

on the 29th January, 1810, had a son born. The trial was caused by this son's claim to the barony being opposed by the youth born on the 8th December, 1802. Hence the main questions put to each medical witness were three:

1. Is it your opinion, that a child born on the 8th December could have been the result of sexual intercourse either on the 30th January (being 311 days), or anterior to it?

2. Is it your opinion that a child born on the 8th December could have been the result of sexual intercourse on the 7th February (304 days), or anterior to it?

3. Do you think that a child born on the 8th December, who has lived to manhood, could be the result of sexual intercourse on or after the 11th July; a period short, at least by two or three days, of five calendar months?

The two extremes of time alluded to in these questions are 311 (or at least 304 days) and 150 days. Hence, if Henry Fenton Jadis, *alias* Gardner, were the son of Lord Alan Hyde Gardner, he must either have been a five months or nearly a ten months and a half child.

Seventeen medical men were examined. Of these, five supported the view that the period of human utero-gestation was limited to about nine calendar months, or from 270 to 280 days. The remaining twelve seemed to maintain the possibility that pregnancy might be protracted to nine and a half, ten, or even eleven calendar months; and so, of course, to 311 days, the alleged term of gestation. The committee was not convinced, however, by the majority; the decision being against the claim of Mr. Jadis's son.

cattle—I say that all these circumstances seem to prove that the period of forty weeks is certainly not invariable. Hence the old argument of *Nature being certain in all her laws*, which in any case has but little meaning, clearly cannot be applied to the present question.

Legislators have been so persuaded of the truth of this principle, that in many countries they have acted upon it in framing the laws. By the Romans the time of gestation was fixed at ten lunar months. The Code Napoléon ordains three hundred days as the duration of pregnancy, and allows legitimacy to be contested after this period. In Prussia the term ordained is three hundred and two days, thus permitting a latitude of three weeks. The Scotch enactments account a child a bastard who is born after the tenth solar month. While the English statutes—on which the American are founded—do not prescribe any precise number of days, but remain as when Blackstone wrote in the year 1765: "From what has been said it appears that all children born before matrimony are bastards by our law; and so it is of all children born so long after the death of the husband, that by *the usual course of gestation* they could not be begotten by him. But this being a matter of some uncertainty, the law is not exact as to a few days."[1]

One great difficulty which arises in discussing this question is, the fact that we are really unacquainted with the exciting cause of parturition. As it is a step in advance to appreciate the full extent of our ignorance, a few remarks may be premised on this head; since it is impossible for us to remain contented with the devout remark of the Arabian physician, Avicenna—*that at the appointed season labor comes on by the command of God.* The observation is very generally admitted as correct, that by far the greatest number of women complete the period of gestation in the fortieth week after the cessation of the menses: or in other words, that the duration of human pregnancy is commonly a multiple of a catamenial period, *i. e.*, 280 days. It must not be inferred, however, that it is equally clear that parturition necessarily occurs at what would otherwise be a menstrual period. Two hundred years have elapsed since this latter suggestion was first published by the illustrious Harvey; who, after making

[1] Commentaries on the Laws of England. Fifth edition, vol. i, p. 456. Dublin, 1773.

some observations on the way in which prudent matrons calculate, says that they, "after ten lunar months have elapsed, fall in labor, and reap the fruit of their womb the very day on which the catamenia would have appeared, had impregnation not taken place."[1] Dr. Rigby clearly entertained the opinion that this view is a correct one, for he made this remark: "It is now ten years ago since we first surmised that the reason why labor usually terminates pregnancy at the fortieth week is, from the recurrence of a menstrual period at a time during pregnancy when the uterus, from its distension and weight of contents, is no longer able to bear that increase of irritability, which accompanies these periods without being excited to throw off the ovum."[2] To Dr. Tyler Smith, however, is due the credit of very plausibly attempting to show that the ovaria are the special organs which excite the uterus to the act of parturition. This gentleman endeavors to prove that not only is parturition essentially a menstrual period, and the mucous discharge tinged with blood—technically the "show"—which accompanies it, as well as the lochial discharge which follows, analogous to the catamenial flow; but also that the relation of the ovarian nerves to parturition is the same as the bearing of the pneumogastric nerves on respiration. In fact, that the periodical stimulation of the ovary is the exciting cause of parturition, acting by reflex action on the uterus through the spinal system of nerves; the ovarian nerves being the *excitors*, and the uterine the *motors*. It is also urged that when utero-gestation is prolonged beyond the ten menstrual periods, parturition is deferred until the following catamenial period; and on the contrary, when it is brought to a premature termination, it is at what would have been a menstrual period that abortion usually takes place. Indeed, according to Dr. Tyler Smith, there is in all women a tendency to abortion at the times represented by the recurrence of what, but for pregnancy, would have been a catamenial period.[3] The physiologists who oppose these views chiefly rely upon the following arguments:

(1) That Dr. Tyler Smith assigns no valid cause why the action at the

[1] The Works of William Harvey, M.D. Translated for the Sydenham Society by Dr. Willis, p. 529. London, 1847.

[2] A System of Midwifery, p 85. London, 1844.

[3] Parturition and the Principles and Practice of Obstetrics. Lecture VIII. London, 1849. Also, Lectures on the Theory and Practice of Obstetrics. "The Lancet," vols. i and ii London, 1856.

tenth period—at the eleventh, if the period prior to suppression be included—should be so much more potent than at any other, except that by this time there is a much greater aptitude to contraction in the uterus itself, and an increased readiness to be thrown off on the part of the placenta; conditions which the objectors consider adequate in themselves to account for the result.—(2) That the period of gestation, although commonly a multiple of the menstrual interval, is by no means constantly so; the former often remaining normal, when the latter is shorter or longer than usual.—(3) Parturient efforts take place in the uterus, notwithstanding the previous removal of the lower part of the spinal cord.—(4) The removal of the ovaries in the later part of gestation does not interpose the least check to the parturient action, as Sir James Simpson has experimentally ascertained.[1]—(5) That when the duration of pregnancy exceeds the ten menstrual periods, parturition is not deferred till the following period; and that the evidence given on the Gardner Peerage Case before the House of Lords in 1825–6, which Dr. Smith cites as favoring his views, is strongly against them. Dr. Samuel Merriman, who was one of the witnesses at the trial, has published a table showing that of 84 women, 33 were delivered in the fortieth week, 22 in the forty-first, 15 in the forty-second, 10 in the forty-third, and only four in the forty-fourth.—(6) The evidence of comparative gestation is against Dr. Smith; inasmuch as experiments carried on under the direction of the late Earl Spencer, on 764 cows, each impregnated by a single coitus, show that although 284 or 285 days is the average term of gestation in this animal, yet an excess of a few days is not uncommon; gestation having been prolonged from 5 to 10 days in 111 out of the 764, and for 28 days in only one of this number.[2] Moreover, it has been proved that in the mare, sow, sheep, goat, bitch, cat, &c., the usual period of gestation may be occasionally exceeded by as much as two or three weeks.

These objections have not been satisfactorily overcome by any arguments which I have read of Dr. Tyler Smith's; and it must be allowed that they seem to be fatal to his very ingenious theory. In fairness to this physician, however, it ought to be stated, *first*, that in some experiments on gravid rabbits, at the middle period of gestation, irritation of the ovaria by galvanism, or pinching with the forceps, brought on contractions of the uterus and vagina; which contractions continued, after the irritation was left off, until the fœtuses were expelled. *Secondly*, that one of the best facts in favor of his views is derived from the circumstance that in many of the lower animals ovulation and œstruation are going on at the very time of parturition. Thus, in the guinea-pig, for example, immediately that the young are dropped, the female admits the male, conception takes place, and a new utero-gestation

[1] Dr. Carpenter's Human Physiology. Fifth edition, p. 819. London, 1855. Also, The British and Foreign Medico-Chirurgical Review. Vol. iv. p. 1. London, 1849.

[2] Journal of the Royal Agricultural Society of England. Vol. i, p. 165. London, 1840.

commences, dating from the very hour of parturition. Nevertheless, that the hypothesis which has now been considered cannot be supported, is, I believe, the opinion of most physiologists. This fact is the more to be regretted since no perfectly satisfactory explanation can be substituted. And therefore we must at present rest content with surmising that the cause of parturition is to be found in the maturity of the ovum; or in the placenta, which —having attained its full evolution as an organ of temporary function—begins to degenerate, while its attachment to the uterus loosens. The author of the essay on *The Physiology of Parturition*, in the review from which I have quoted, well observes: "The act of parturition was likened by Buffon to the dropping of ripe fruit; and we believe that, in seeking for its cause partly (to say the least) in that condition of the uterus and its contents which may be designated as *maturation*, we are justified by all the facts at present known to us."

Another obstacle to a satisfactory settlement of this question is owing to the circumstance that many physicians who have constructed statistical tables from the observation of a large number of cases, have commenced their calculations from different epochs. Thus the reckoning of some is calculated from the date of the cessation of the catamenia; of others, from the time of a single coitus; of a third class, from the day of quickening; and of a fourth, from the hour of conception, which they assert is known to many females by certain peculiar sensations experienced at the moment of conception. It is almost unnecessary to say that the observations of the first and second classes are alone deserving of any attention; while the most trustworthy views, probably, are those derived from calculating the duration of pregnancy from a single coitus.

A third impediment to our making exact calculations is the impossibility of fixing the date of conception or impregnation, even when that of insemination is known. In other words, the interval which elapses between a fruitful intercourse and the actual vivification of the ovule by the semen is uncertain; but that the period is not insignificant, and that it may be interfered with by a variety of physical and moral causes, is highly probable. For obvious reasons, but little exact evidence on this subject derived from observations on the human female can be brought forward. Hence we are driven to make such deductions as are

possible from analogy—from the results of experiments on animals. Now physiologists have long since proved that for impregnation to take place it is not necessary that the semen should be newly expelled by the male. Valentin states that, "On opening the body of a female mammal one or more days after it has received the male, semen may be found not only in the body and horns of the uterus, but also in the oviducts, and on the surface of the ovary. The spermatozoa are in vigorous movement. These may retain their activity for a week or more in the female organs."[1] More than sixty years ago Haighton showed that conception does not generally take place in the rabbit till about fifty hours after insemination; a long period, considering that the ordinary interval between insemination and parturition is only thirty days. He found that division of the Fallopian tube before the expiration of two days prevented conception; while, by waiting longer, impregnation was not impeded by the mutilation.[2] Dr. Samuel R. Percy, of New York, found living spermatozoa in a mass of muco purulent-looking matter projecting from the os uteri of a lady, eight and a half days after the last intercourse with her husband.[3] Consequently it may be looked upon as proved, that the spermatozoa retain vitality when in the female genital passages, and especially when in the uterus, for several days; although we cannot say exactly for how many. And this circumstance probably gives the key to the fact, that notwithstanding the Jewish people of the present time act up to the law as expressed in the book of Leviticus,[4] yet they are as fruitful as their Christian neighbors. It is certain, that intercourse shortly before a menstrual period is very likely to cause conception; and not only so, but that when conception happens it may possibly prevent the catamenia from making their appearance, although I believe that more commonly such a result only makes the discharge very scanty at that period. Whether then the ovule finds

[1] A Text-Book of Physiology. Translated from the German by Dr. Brinton, p. 641. London, 1853.

[2] The Philosophical Transactions of the Royal Society. Vol. lxxxvii, p. 159. London, 1797.

[3] The American Medical Times, p. 160. New York, 9th March, 1861.

[4] "And if a woman have an issue, *and* her issue in her flesh be blood, she shall be put apart seven days: and whosoever toucheth her shall be unclean until the even.

"And if a woman have an issue of her blood many days out of the time of her separation, or if it run beyond the time of her separation; all the days of the issue of her uncleanness shall be as the days of her separation: she shall be unclean.

"But if she be cleansed of her issue, then she shall number to herself seven days, and after that she shall be clean." Leviticus xv, 19, 25 and 28.

the spermatozoa in the uterine cavity, or the spermatozoa have to wait the arrival of the ovule, is a matter of no consequence, within certain limits. The question is, as to the time of contact. And it seems therefore not altogether improbable, that by hereafter making a distinction between the date of insemination and that of fecundation, less discordant views as to the duration of pregnancy may be entertained.

Three highly esteemed authors—Drs. Samuel Merriman, James Reid, and Edward W. Murphy—have published useful tables of cases derived from their own practice, to show the date of delivery, as reckoned from the last day of the last catamenial period. Dr. Merriman's data were obtained from the births of 114 mature children; the dates being calculated from, but not including, the day on which the catamenia were last distinguishable.[1] Dr. Murphy's similar cases number 168;[2] while Dr. Reid's amount to 500.[3] In addition I now give the results in 103 cases of my own; premising, that those only have been selected from my note-book where the patients' statements could be relied on, and where I attended her in labor. In the two following tables, a comparative view can be taken of these 885 cases:

DATE OF DELIVERY, CALCULATED FROM LAST DAY OF CATAMENIA.

Weeks.	Days.	Merriman.	Reid.	Murphy.	Author.
37th,	From 252d to 259th,	3	23	12	4
38th,	" 260th to 266th,	13	48	14	7
39th,	" 267th to 273d,	14	81	27	18
40th,	" 274th to 280th,	33	131	28	37
41st,	" 281st to 287th,	22	112	39	16
42d,	" 288th to 294th,	15	63	21	12
43d,	" 295th to 301st,	10	28	25	6
44th, and upwards,	" 302d to 324th and upwards,	4	14	2	3
		114	500	168	103

To exhibit these facts more clearly they may be reduced into another form, and the weekly percentage of deliveries shown:

[1] The Medico-Chirurgical Transactions. Vol. xiii. p. 338. London, 1827.

[2] A Report of the Obstetric Practice of University College Hospital, London, p. 9. Dublin, 1844.

[3] The Lancet, 13th April, 1850, p. 438; 18th May, 1850, p. 596; 20th July 1850, p. 77; 3d September, 1853, p. 205; and 10th September, 1853, p. 235.

PERCENTAGE OF WEEKLY DELIVERIES FROM LAST DAY OF CATAMENIA.

Weeks.	Days.	Merriman.	Reid.	Murphy.	Author.
37th,	From 252d to 259th,	2.65	4.60	7.14	3.88
38th,	" 260th to 266th,	11.40	9.60	8.33	6.79
39th,	" 267th to 273d,	12.28	16.20	16.07	17.47
40th,	" 274th to 280th,	29.00	26.20	16.66	35.92
41st,	" 281st to 287th,	19.30	22.40	23.21	15.53
42d,	" 288th to 294th,	13.16	12.60	12.50	11.65
43d,	" 295th to 301st,	8.77	5.60	14.86	5.82
44th, and upwards,	" 302d to 324th and upwards,	3.50	2.80	1.20	2.91
		100.	100.	100.	100.

From the examination of these tables it clearly appears that considerable variations occur in the duration of pregnancy when the calculations are made from the last day of the last menstrual period. This irregularity may be partly accounted for by the circumstance, that although in most instances impregnation doubtless takes place within two or three days of the cessation of the catamenia, yet it need not necessarily do so. There can be no doubt, as has already been mentioned, but that a fruitful intercourse may take place just before a catamenial period; while in consequence of such impregnation, the expected flow may not occur. Now by applying this explanation to the most protracted cases of Drs. Merriman and Reid, we reduce their extraordinary to very ordinary cases. Thus, Dr. Merriman's most prolonged gestation was 306 days: but $306 - 28 = 278$. So again, Dr. Reid's longest case was 316 days: $316 - 28 = 288$. In my own practice, the longest interval between the cessation of the catamenia and parturition was 317 days; and $317 - 28 = 289$. With regard to Dr. Murphy's two patients, however, we are deprived of this explanation, inasmuch as he applies it himself. The fact is, that of the two instances which went over the 302d day, one is said to have had gestation prolonged to 342 and the other to 352 days; these figures being reduced to 314 and 324 respectively by subtracting 28. For my own part, however, I attribute very little importance to either of these cases. The reports were drawn up simply from the statements of the patients themselves, there being no corroborative evidence of any kind; and as such

statements would not be admitted in proof of any other anomalous occurrence, I cannot see why they should be accepted here.

If, however, the difficulty of fixing the time after the menstrual period at which impregnation can occur were the only cause for the irregularities brought out by the foregoing tables, we should of course obtain undeviating results by reckoning the date of the occurrence of labor from the time of a single coitus. The following table by Dr. Reid, formed from the largest number of cases of conception from a single intercourse which has been yet collected by one author, may suffice as an answer to the question, whether the results so obtained are variable or not. It consists of forty-three—with two exceptions—trustworthy cases of conception, the dates being calculated from a single coitus:

260	days after a	single	coitus,	delivery occurred in	1
263	"	"	"	"	1
264	"	"	"	"	2
265	"	"	"	"	1
266	"	"	"	"	2
270	"	"	"	"	1
271	"	"	"	"	2
272	"	"	"	"	3
273	"	"	"	"	1
274	"	"	"	"	7
275	"	"	"	"	2
276	"	"	"	"	5
278	"	"	"	"	1
280	"	"	"	"	3
283	"	"	"	"	1
284	"	"	"	"	1
286	"	"	"	"	1
287	"	"	"	"	3
291	"	"	"	"	1
293	"	"	"	"	2
296	"	"	"	"	1
300	"	"	"	"	1
					43

This table shows that the duration of pregnancy, reckoning from a single intercourse, varied between 270 and 280 days in 25 out of 43 cases; or taking the whole of the latter number, that the time ranged from 260 to 300 days. In my own note-books, I find only two cases in which it is certain that pregnancy resulted from a single coitus; and in one of these delivery took place 270 days subsequently, and in the other on the 275th day. Now by comparing the results in these 45 cases with those shown in the two preceding tables, it is seen at once that the variations from established rule are much more numerous in the latter than in the former. And even with regard to the last two of the 43 cases by Dr. Reid it should be stated that the evidence derived from them is rather of a doubtful character. The *first* of these occurred in the practice of Dr. McIlvain, of Charlotte, North Carolina: Mrs. S., a lady, was visited by her husband from a distance, on 1st July, 1847: he

remained until the morning of the 6th, and did not again see his wife for nine months. Intercourse took place on the 1st, 2d, 3d, and 4th July. Shortly afterwards symptoms of pregnancy appeared; but parturition did not take place until 23d April, 1848, being 293 days after the 4th July, or 296 after the 1st.—The *second* history was communicated by Dr. Ashwell: The catamenia terminated on the 25th January, the husband leaving a few days after, and being absent six weeks. The lady was confined on the 27th November; being 300 days after the supposed fruitful intercourse, or 258 days after the husband's return. Dr. Ashwell imagines that the infant was not prematurely born, inasmuch as it was much larger than the patient's other children. Excluding these two cases from our calculations, it appears that 293 days was the longest period to which gestation extended in 43 instances, where a single intercourse took place.

To make this subject more clear and certain, we may compare the results now obtained with those which have been gathered from observations upon the lower animals; for although some of my readers may think that facts so derived are not applicable to the human subject, yet a little consideration seems to me to show that the argument from analogy is to a certain extent trustworthy. M. Tessier's researches—conducted with unusual care through a period of forty years—on the time of gestation in 575 cows, from a single coitus, gave the following results:[1]

21	cows calved	between the	260th	and 270th	days.
213	"	"	270th	" 280th	"
321	"	"	280th	" 297th	"
6	"	at 298 days.			
4	"	at 299 "			
10		between the	300th	and 321st	"
575					

Experiments on mares by the same writer proved that similar deviations occur. Of 447 mares, whose natural period of gestation is eleven calendar months, or about 335 days,—

51	foaled	from the	290th	day to the	329th.
96	"	"	329th	"	335th.
258	"	"	335th	"	359th.
35	"	"	359th	"	377th.
7	"	"	377th	"	419th.
447					

The observations on asses, buffaloes, sheep, sows, rabbits, and bitches, showed that variations similar in degree occurred. Earl

[1] Mémoires de l'Académie Royale des Sciences de l'Institut de France. Tome ii, p. 1. Paris, 1819.

Spencer's experiments on 764 cows have been already alluded to; but it seems advisable to quote them here more fully, as they serve to corroborate the opinions advanced at the commencement of this chapter. The results obtained by this nobleman may be thus tabulated:

				Cow-calves.	Bull-calves.	Twins.
25	Cows calved between the	220th and 259th days.	The produce was	10	15	...
35	"	262d and 275th days.	"	14	15	6
15	Cows calved on the	276th day	"	7	6	2
14	"	277th "	"	10	2	2
18	"	278th "	"	11	4	3
32	"	279th "	"	16	11	5
35	"	280th "	"	15	20	...
39	"	281st "	"	20	18	1
47	"	282d "	"	26	20	1
54	"	283d "	"	30	24	...
66	"	284th "	"	33	33	...
74	"	285th "	"	29	43	2
60	"	286th "	"	22	38	...
52	"	287th "	"	25	27	...
42	"	288th "	"	13	28	1
45	"	289th "	"	20	25	...
23	"	290th "	"	10	13	...
31	"	291st "	"	9	22	...
16	"	292d "	"	5	11	...
10	"	293d "	"	1	9	...
8	"	294th "	"	1	7	...
7	"	295th "	"	3	4	...
6	"	296th "	"	2	4	...
2	"	297th "	"	1	1	...
1	"	299th "	"	...	1	...
1	"	304th "	"	1	...	...
1	"	305th "	"	1	...	...
3	"	306th "	"	3	...	...
1	"	307th "	"	1	...	...
1	"	313th "	"	1	...	...
764				340	401	23

This table, like that of M. Tessier, proves without a doubt that in the cow, when the date of impregnation was positively certain, yet the day of parturition was far from being precise and determinate. The average term of gestation in this animal seems to be 284 or 285 days; 314 of the cows having calved before the two hundred and eighty-fourth day, and 310 after the two hundred and eighty-fifth. None of those calves which were born before the two hundred and forty-second day were reared.

If, then, we are forced to admit that in the human subject, as in animals, the period of gestation is liable to considerable variations, the question naturally arises,—What is the greatest extent to which pregnancy may be prolonged beyond the common period of gestation? A reply cannot very readily be given to this inquiry. In fact, the subject has been so complicated by

the concoction of extravagant fable, the promulgation of erroneous and rash hypotheses, as well as by the narratives of imperfectly observed cases, that it is difficult to sift the true from the false.

The obstetricians of the Celestial Empire allow a very wide margin. In a modern work on Chinese midwifery it is noted: "The great pharmacopœia says that pregnancy generally continues for seven or eight months, and sometimes for one or two years, and in some rare cases even for four years, and this should be made known."[1] According to the Hindu medical Shástras, ten calendar months are allowed for the perfection of the fœtus in utero. The expulsion of the child is thus explained: "At the tenth month the fœtus acquires knowledge, and prays to God, and sees the seven heavens, the earth, and the inferior regions. By the air of the pelvis (*opana bayu*) the fœtus is then expelled, as an arrow is shot from a bow, and the child falls insensible to the ground. All his former knowledge is immediately forgotten, and on losing so many pleasing illusions, he cries."[2] M. Hamont, for some years the director of the School of Veterinary Medicine of Abou-Zabel, states that in Egypt the judges gravely decided that,—"Children may remain in the mother's womb for four years. After five years this cannot be."[3]

Mons. A. Petit believed that gestation might be prolonged to the end of the eleventh or twelfth month, or even far beyond this time; and asserted that cases proving this had occurred many times. In one instance, a woman was pregnant for three years and then gave birth to a stout live boy. About the tenth month she had suffered from pains, and had lost about three quarts of water; but this flow was checked by bleeding. The truth of this history was testified by the signatures of the burgomaster of the town, one notary, and two surgeons. Such remarkable corroborative evidence appears to have quite removed all feeling of incredulity on the part of Mons. Petit. And not only so, but twenty-three of the most eminent physicians of the

[1] A Treatise on Midwifery. A New Edition, published in the fifth year of Taou Kwong, 1825. Translated from the Chinese by Dr. W. Lockhart. Published in The Dublin Journal of Medical Science, vol. xx, p. 357. Dublin, 1842.

[2] A Commentary on the Hindu System of Medicine. By T. A. Wise, M.D., &c., p. 37. Calcutta, 1845.

[3] Annales d'Hygiène Publique, et de Médecine Légale. Tome x, p. 204. Paris, 1833.

day agreed with him that the report was correct, and signed a certificate to that effect.[1]

Velpeau, in addition to eight cases published in 1829, has recorded another in which he distinctly felt the active and passive movements of the fœtus at the fourth month. Symptoms of labor set in at the end of the ninth month; but they were soon suspended, and did not return for thirty days. He believes that the gestation lasted for 310 days.[2]

Dr. Ryan attended a delicate woman, who menstruated the last week in February, 1826, and quickened in July. She had spurious pains in November and December and January; and was delivered on the 28th February, 1827, nearly twelve months from her previous menstruation. Such is the evidence, and here is the corollary: "I most solemnly declare that the case is a true one, and not fabricated to support any particular opinion. This is the longest instance of protracted pregnancy which has hitherto been recorded in British medicine."[3]

The majority of the medical men examined in the Gardner Peerage Cause were in favor of protracted pregnancy; and Dr. Granville asserted that in his own wife gestation lasted at least 306, and perhaps 318 days. The only evidence that it did so is, that this lady missed her menstruation on the 7th April, on the 15th August she quickened, on the 7th February she was delivered; and the accoucheur, the patient, Dr. Granville, and "every one," on examining the large infant, agreed that it was a ten months' child. Mr. John Sabine gave equally *valuable* evidence as to his own wife, whose last period of menstruation took place about the 14th September, quickening occurred during the second week of January, but delivery was delayed until the 14th of the August following.

Three examples of protracted pregnancy have been reported by Mr. Robert Annan. As, however, they were not published until several years after they occurred, and even then were only given "as nearly as my notes and recollections permit," the histories would have to be received with caution though they were much

[1] Recueil de Pièces concernant les Naissances Tardives. Une Consultation, &c., délibéré à Paris, 22d Janvier, 1765. Amsterdam, 1766.

[2] Traité Complet des Accouchemens, ou Tocologie théorique et pratique. Tome i, p. 383. Paris, 1835.

[3] A Manual of Midwifery; or Compendium of Gynæcology and Paidonosology. Third Edition, p. 133. London, 1831.

more satisfactory than they really are. But in fact, the first two cases only prove that a couple of women were not delivered at the time they expected. In the third instance, Mrs. ——, menstruated for the last time on the 1st April, 1836. After an interval of 327 days, labor supervened; and at the end of twenty-four hours she was delivered, on 15th February, 1837, of a male child weighing 10 lbs. 14 ozs. The husband was quite convinced that the period of pregnancy had been protracted, because "during nearly the whole period above mentioned, he had not approached the nuptial bed."[1] Mr. Annan thinks this case affords "almost decisive evidence of protracted pregnancy;" but it is to be hoped that he will "nearly" or "almost" stand alone in this conclusion.

The opinion of the American court regarding the possible protraction of pregnancy, as elicited during a lawsuit for bastardy at the Lancaster Quarter Sessions, is deserving of our notice. In this case the prosecutrix swore that her child was begotten on the 23d March, 1845, and was born on the 30th January, 1846, making the period of gestation 313 days. At the trial six American physicians and surgeons testified against the possibility of the protraction of pregnancy. On the other side, five practitioners of medicine declared their belief in the occasional extension of gestation beyond the normal period, and in the possibility of its protraction to 313 days. Dr. Atlee, in particular, asserted that two cases "had occurred in his own practice, in which, by all the usual methods of calculation, the patients must have gone at least ten calendar months."[2] In charging the jury, the president of the court held that protracted gestation for a period of 313 days, "although unusual and improbable, was not impossible;" and in accordance with this charge the jury found a verdict against the defendant.

Dr. Meigs says he has "reason to believe that pregnancy may endure even beyond twelve months." In proof, he relates a case—which seems chiefly to have been believed on account of the woman's appearance of perfect candor and sincerity in all that she said—where impregnation was deemed to have taken place in July, 1839, and in which delivery was not accomplished

[1] Edinburgh Medical Journal, vol. ii, p. 716. February, 1857.
[2] The American Journal of Medical Sciences. New Series, vol. xii, p. 536. Philadelphia, 1846.

until the 13th September, 1840, a term of 420 days.[1] The *well-authenticated* case of Albert Kranz, quoted by Schenk, is scarcely more extraordinary. In this instance the wife of Count Baruch de Vandal became pregnant, and carried the child for two years; so that when it was born, it could walk and speak!

Many more examples, both from ancient and modern literature, might be quoted to prove that the narrators were convinced of the occasional occurrence of very protracted gestation. It is quite unnecessary to do this, however, since the histories are most unsatisfactory, and destitute of any facts approaching to proof. When we remember how easily women become the dupes of their own fertile imaginations; how necessary it often is, for the sake of reputation, that they should endeavor to deceive medical men;[2] how difficult it is to be accurate when the calculation is commenced from the cessation of the catamenia; and, in short, how varied and numerous are the sources of error that may vitiate the first impressions produced by examining these cases,—we shall hardly be surprised at some of the extraordinary statements which have just been quoted.

To show that even the strictly medical evidence, derived from a physical examination, must be received with great caution, in cases of assumed protracted gestation, I quote the following case from Dr. Reid's essay:

[1] Obstetrics; the Science and the Art. Fifth Edition, p. 235. Philadelphia, 1867.

[2] The following anecdotes may serve as a guide to the explanation of not a few of the cases which have been from time to time brought forward:

The widow of a bookseller at Wolffenbuttel was delivered of a child thirteen months after her husband's decease. The child, if begotten by him, was heir to his property; but otherwise, the goods and money went to distant relations. The child was declared legitimate, owing to the excellent character of the mother, and to its being thought probable that her delivery was delayed by the deep grief into which she was plunged by the loss of her husband. Shortly after this decision the lady was married to Christopher Misnerus, who acted as shopkeeper in the business during her widowhood!

Victor Ratier relates the following romance of Mary of England, the third wife of Louis XII, who was left a widow shortly after her marriage. After the death of this king, who had no male issue, the throne was to revert to the young Comte d'Angoulême, who afterwards became Francis the First. The widowed queen had retired to the Hôtel de Cluny, and, in order to secure the regency, spread a report that she was pregnant; a supposition (which as we shall see hereafter) she hoped to carry out successfully. But Francis's mother, Louisa of Savoy, who saw (says Brantôme) how much was at stake for herself and her son, carefully watched the movements of one who wished to play the part of queen mother so much to her disadvantage. One day she was informed by her spies that Mary, as tender as she was ambitious, had made an assignation for that night with Charles Brandon, Duke of Suffolk. The mother and son, accompanied by four gentlemen of the highest rank at court, surprised the lovers at a moment which generally allows of little solemnity; and required that the Abbot of Cluny should forthwith celebrate the nuptials in the adjoining chapel. This ceremony took place accordingly in the night of the 31st of May, 1515. The fruit of this impromptu marriage was the unfortunate Lady Jane Grey.

Mrs. F., married on the 8th May, had her catamenial period unexpectedly on that day. Shortly afterwards she was attacked by morning sickness: the abdomen gradually enlarged, and other symptoms of pregnancy followed. In the fifth month decided movements were felt; and everything apparently progressed favorably until the 18th December, which was thought to be the seventh month. There had been, however, an irregular uterine discharge every four or five weeks during the above period. At the date mentioned, pains came on at intervals, accompanied by a very free discharge, almost amounting to flooding, but no substance was passed. The monthly nurse arrived, and the practitioner who had been engaged to attend the lady was summoned. On his arrival, he examined the abdomen, and pronounced the patient advanced to the seventh month; remarking also that he could feel the limbs of the fœtus through the parietes of the abdomen. Simple remedies were prescribed, and the pains subsided by the next morning. The patient was kept in the recumbent position, the size of the abdomen now remained stationary, and the nurse—after waiting three months in the house—took her leave. The movements had continued as strong as before, but for the last three months there had been no return of the menstrual function; and the morning sickness was much more intense than formerly. The abdomen still further increased in size, and she was delivered on the 1st September of a moderately-sized child, eight and a half months after she had been pronounced by medical authority fully seven months advanced in pregnancy.

"Now here," says Dr. Reid, with great justice, "is a very fair sample of the usual case of very protracted gestation, which we meet with in the older authors. A surgeon, after making a cursory examination of the abdomen, decides that the lady is seven months advanced in pregnancy on the 18th December, and therefore by his evidence, the lady must have retained the fœtus in utero during a space of nearly sixteen months. But the arrested catamenia, and the intense sickness in December, much more probably point at the real commencement of pregnancy; the reasonable conclusion is, that this state lasted for about eight months and a half only, and that the medical attendant had deceived himself." To these remarks let me add the suggestion that this case might have assumed all the importance of one of the "Causes Célèbres," had this lady become a widow only a few weeks prior to her spurious parturition; and then fancying herself pregnant, and hence safe from detection, allowed sexual intercourse with a favored admirer about the month of December. In some court of law the lady's immaculate virtue would have been appealed to in glowing terms, the impossibility of the "eminent" surgeon's opinion being erroneous would have been insisted on, the child would have been declared legitimate, and an undoubted instance of very protracted gestation would have

been added to those examples which have been already credited by judges and juries.

The following case is of a different character. It is justly adduced by Desormeaux, as proving that the term may be slightly prolonged beyond the usual period:

A lady, the mother of three children, became deranged after a severe fever Her physician thought that pregnancy might have a beneficial effect on the mental disease, and permitted her husband to visit her; but with this restriction, that there should be an interval of three months between each visit, in order that if conception occurred the risk of abortion from further intercourse might be avoided. The physician and attendants made an exact note of the time when the husband's visits took place; and as soon as symptoms of pregnancy began to appear, the visits were discontinued. The lady was closely watched by her female attendants all the time. She was delivered at the end of nine calendar months and a fortnight by Desormeaux. The number of days is not given, but taking the shortest nine months we shall have $273+14=287$; or if other nine months were those meant we might have $276+14=290$ days.[1]

Dr. William Hunter is said to have replied to a question as to the duration of pregnancy, in these words: "The usual period is nine calendar months, but there is very commonly a difference of one, two, or three weeks. I have *known* a woman bear a living child, in a perfectly natural way, fourteen days later than nine calendar months; and *believe* two women to have been delivered of a child alive, in a natural way, above ten calendar months from the hour of conception."

The proposition that the time of parturition is dependent upon a cycle of ten catamenial periods has been already referred to. Regarding this as a physiological fact, Cederschjöld has tried to show that the duration of gestation is influenced by the length of the intervals between the catamenial periods. Thus, these intervals, though usually consisting of twenty-eight days, need not invariably do so; and he asserts that it is by no means rare to meet with variations. Hence, in a woman whose menses recur every twenty-nine days, we shall have $10 \times 29 = 290$ days = the duration of her gestation. Or, again, in one who menstruates every thirty days, $10 \times 30 = 300$ = the length of her pregnancy. These ingenious views have been commentated on by Schuster, who has related the case of his own wife in confirmation of

[1] Dictionnaire de Médecine, 2me edition, tome xiv, p. 437. Paris, 1836.

them. This lady's menses recurred every twenty-nine or thirty days. Her first pregnancy ended on the 296th day: her second lasted exactly 300 days.

Dr. Jörg fixes the duration of gestation as 280 days from the time of conception, and will not allow that this period is liable to fluctuation, as in the females of many classes of animals. He seems to think that instances of *protracted parturition* have been mistaken for *protracted gestation.* A case in point is detailed, in which labor commenced on the 280th day; but owing to the weakness of the pains and the length of the remissions, the child was not born until after the lapse of fourteen days.[1] No doubt many medical men would have set down such a case as one of gestation prolonged to 294 days. I am acquainted with the history of a more extraordinary case, which may be briefly related, as there is no doubt in my mind that it is perfectly authentic. The chief facts as they were detailed to me by my patient are these:

Mrs. F., a lady of delicate health, forty-one years old, was delivered of her third child, in Manilla, on the 10th March, 1847. When the infant was fourteen days old it was weaned; the climate, it is said, being too hot to allow of European ladies suckling their offspring At the end of the next month the catamenia came on, and after continuing for four days ceased on the 30th April. The courses did not again return, but my patient believes that she did not become pregnant until the 20th May; while she is certain that intercourse never took place after that date, on account of the serious illness of her husband. This gentleman died on the 31st August, and Mrs. F. soon afterwards returned to England. She calculated that her labor would come on about the middle of February, 1848; as it ought to have done, supposing her opinion as to the day of fecundation correct. If we reckon in the usual manner, and say that labor should have supervened 280 days after the last catamenial period, it will be seen that delivery ought certainly to have taken place on the 4th February; but if we adopt the better plan—so seldom possible, however—and calculate 275 days from the time of the fruitful coitus, then the accouchement was to be expected on the 19th February. Now it is remarkable that labor pains first manifested themselves on the 18th February, so that everything was prepared for the immediate birth of the infant. But at the end of a couple of hours the pains went off, and did not return till the next day. Again they ceased for twenty-four hours, and again returned; and this happened every day for three weeks. Sometimes only two or three pains were experienced, sometimes the parturient efforts came on frequently for half-an-hour or a little longer and then subsided. She was delivered of a live girl, remarkable for its size, on the 11th March; being twenty-two days—for it was leap-year—from the 19th February, or 297 days from the last coitus.

[1] Die Zurechnungsfähigkeit der Schwangern und Gebärenden beleuchtet. P. 238.

Now, it must not be imagined from the foregoing, that I agree with Dr. Jörg and believe that all the cases in which gestation continues beyond 280 days are merely examples of tardy labor. On the contrary, it seems to me that such a position is quite untenable; independently of its being at best merely the same thing under a different name, a specious distinction of little, if any, value. I would therefore rather say, that we are in a position to assert positively that gestation may be prolonged beyond the usual or normal period; although no case has occurred so far as my own personal experience goes, in which the time has been extended for more than three weeks and one day, calculating 275 days as the natural interval from a successful coitus. I believe further, that all recorded experience of any value, as well as the few trustworthy experiments which have been performed, teach us that the cases in which utero-gestation in the human subject have been prolonged beyond ten calendar months are exceedingly rare. But that such departures from the common law may possibly occur, seems to me proved by an example which has been very clearly related by Dr. Joynt. I have ventured to abbreviate this gentleman's report, though I would recommend a careful perusal of his essay to all who are interested in this subject. The following is an outline of the case:

A lady, aged about 30, became a patient of Dr. Joynt's in November, 1863. She had been pregnant six times; but on two of these occasions had miscarried,—the last time in the previous April. She complained of excessive menstruation, and of ovarian pain. Was also the subject of hystero-epileptic fits. Caustics had frequently been applied to the lips of the uterus. The uterus and ovaries were found free from any organic lesion on an examination being made by Dr. Joynt.

On the 28th December, 1863, the catamenia occurred; they ceased on the 2d January, 1864. About the middle of this month, intractable morning sickness set in; of the same character as had signalized the commencement of former pregnancies. At the next expected period, menstruation did not occur. The sickness continued until the last week in March; and on the 28th of this month she quickened, fœtal movements being distinctly felt. On the 12th May, she was threatened with miscarriage, but the symptoms yielded to treatment.

On the evening of the 3d October, having arrived at her full time, as she believed, labor pains set in. They increased in force till the following morning, when they went off. Exactly similar phenomena occurred on the evening of the 4th, and again and again on successive days, for some six times in all. During an intermission a vaginal examination was made; the cervix uteri was quite obliterated, and the os uteri patulous. On three separate occasions there was a discharge of about a pint of water from the vagina.

Uterine pains, observing nearly the order and duration of the first set, continued to recur at uncertain intervals until the 21st November. Labor then actually set in, and on the following morning, precisely seven weeks from the first occurrence of pains, she was delivered of a mature male child. The infant had no other peculiarity than a tolerably good head of hair; the former children having had no hair at birth. The period of convalescence was very favorable.

It is probable, that in this case the minimum duration of pregnancy was 317 days, or nearly six weeks more than the average. The patient's husband was absent from 26th December to the 6th or 7th January. He remained with her until the 10th January. Before he again visited her, the characteristic morning sickness had convinced Dr. Joynt that pregnancy had commenced.[1]

Every obstetrician is expected to be able to predict, with some slight approach to accuracy, the day when labor may be expected. The only certain data for reckoning the time of this event are those depending on the known time of a successful or fertilizing coitus. It has been proved that the average duration of pregnancy when computed from this occurrence is about 275 days. But it is obvious that reliable and exact information on this head can only very rarely be obtained; and hence the period must be calculated from the date of the cessation of the catamenia. To effect this readily we cannot do better than follow the plan of most German obstetricians, who foretell the probable day of delivery thus: The date of the last menstruation being given, it is merely necessary to calculate three months backwards and add seven days. For example, suppose the 20th of January to be the last day of the last menstrual period; then labor will be due about the 27th October,—*i. e.*, on the 280th day.

Dr. Charles Clay has attempted to prove that the term of utero-gestation is regulated by the ages of the parents; and he endeavors to establish this proposition by the examination of recorded experiments on animals, as well as by the investigation of some twenty authentic instances of pregnancy resulting from a single act of coition in the human subject. In these latter cases, one prominent fact is said to be undeniably illustrated, viz., "*that the younger the parties concerned, the shorter the term of utero-gestation;* and, *vice versâ* as age increases, *the term of gesta-*

[1] Dublin Quarterly Journal of Medical Science. Vol. xlii, p. 377. August and November, 1866.

tion is proportionably lengthened."[1] By placing in juxtaposition the few cases on which full reliance can be placed, it will be seen that this statement seems to be correct:

At	12½	years,	the term of gestation	was	264 days.
"	15	"	"	"	267 "
"	15 to 15½	"	"	"	267 "
"	16 to 17	"	"	"	270 "
"	19	"	"	"	272 "
"	25	"	"	"	274 "
"	30	"	"	"	276 "
"	35	"	"	"	278 "
"	44	"	"	"	284 "
"	52	"	"	"	290 "

In the preceding examples the mother's age alone is given; although when Dr. Clay maintains that the duration of utero-gestation is definite and regulated by age, he means that in order to arrive at accurate conclusions it is necessary to take into the calculation the age of both parents, and to strike a mean between the two. For example, suppose a female of 20 to cohabit with a male 30 years old, a result may be expected nearly equal to an age of 25. To be still more exact, it is thought that a slight allowance should be made for the well-known fact, that the female arrives at maturity earlier than the male; and hence, taking the same figures, a female at 20 and a male at 30, we should fix upon 24 instead of 25; or *vice versâ*, a female at 30 and a male at 20, the result would be, not 25 or 24, but 26. Before the truth or fallacy of these propositions can be substantiated, however, a large number of careful observations by independent observers must be collected; though it may be justifiably conceded, even at the present stage of the inquiry, that Dr. Clay's views are not only rather ingenious, but so far sufficiently supported to merit further investigation.

In conclusion it may be mentioned that there is a popular belief, especially prevalent in fishing towns, where the date of a fruitful intercourse is often more positively known than in other places, that when the time of gestation is longer than usual the produce will very probably be a male child. This opinion is slightly corroborated by Earl Spencer's observations on cows.

[1] Observations on the Term of Utero-Gestation. By Charles Clay, M.D., Manchester, p. 9. London, 1855.

In examining these experiments we ought to exclude from our calculation those cows which calved before the 260th day, and after the 300th, as being anomalous cases. We shall then find that 233 cow-calves and 234 bull-calves were produced by those 489 cows whose period of gestation did not exceed 286 days; while the 243 cows whose period exceeded 286 days, gave 90 cow-calves, and 152 bull-calves. A patient of my own, a farmer in Derbyshire, tells me that it is a common opinion which he regards as well-founded, that when the cow goes over her time by a week or ten days, the produce of her labor will be a bull-calf. And so with the mare, when her gestation exceeds the usual term of eleven months, she more frequently gives birth to a horse colt than a filly.

Moreover, it may be mentioned that in my record of midwifery cases I find that children of much greater weight than ordinary have almost invariably been males; and this increase in size has very commonly been attributed by the mothers to their having gone a longer time than their calculations had led them to expect. On examining Dr. Murphy's cases it appears that out of 90 instances in which the mothers were not delivered until after 280 days from menstruation, 43 per cent. of the children born were girls, and 57 per cent. were boys. On the other hand, we have the statement of Tessier, that he ascertained beyond any doubt that the protraction of gestation in the cow and mare was neither influenced by the age, constitution, or food of the animal; nor by the size, sex, or strength of the fœtus.

The objection has been made to this kind of evidence by Dr. Matthews Duncan, that the reasoning from analogy between the cow and woman has been much overstretched; and he attempts to show, that many of the cases of protracted gestation which have been reported are untrustworthy, *because* the infants when born did not exceed the usual size. Indeed, he says that two cases had been under his own care, in which gestation was, with some reason, supposed to be prolonged; but that he refused to place them in this category, "because, although the ladies were in good health at the time of falling in the family-way, yet the infants born were not at all larger than their former children."[1] And he further adds, that he does not know of "an individual

[1] Fecundity, Fertility, Sterility, and Allied Topics, p. 346. Edinburgh, 1866.

instance of certainly protracted gestation in which the production was small and light in weight."

Now at first sight this opinion of Dr. Duncan's seems only consonant with what might reasonably be expected. For certainly as an infant's life gets lengthened, whether it be born or not, so day by day does it increase in size. But when we come to apply this law to any special case, it is seen that certain other conditions besides duration of life have possibly been brought into action and must claim consideration. Thus disease, without destroying life or mutilating the body, may doubtless retard development. Or, to take extreme instances, the assertion of Dr. Graves may be cited,—that "dwarfs generally come into the world after the ordinary term of gestation."[1] Remembering that the normal fœtus at maturity has an average length of from eighteen to twenty inches, there can be no objection to the inference that dwarfs are much below this size at birth; although, of course, their growth may only be checked subsequently. Still we know that Jeffrey Hudson was only eighteen inches high at the age of eight years; Borwilaski at twenty-two was twenty-eight inches; while Bebe—a seven months child—was only between seven and eight inches long, and weighed a pound, when born. Moreover, the case published by Dr. Joynt, and already quoted, tells against Dr. Duncan's views. At all events, I think sufficient has been said to show that all statements on this question should be received with considerable caution; for the subject undoubtedly requires further investigation.

[1] Studies in Physiology and Medicine, by the late Robert James Graves, F.R.S. Edited by William Stokes, p. 241. London, 1863.

CHAPTER V.

THE PREMATURE EXPULSION OF THE FŒTUS.

1. Introduction—Definition of the terms abortion, miscarriage, and premature labor—Characteristics of the embryo at different ages—Earliest period at which the fœtus can reach maturity.—2. Causes of abortion—As they are accidental—As they are due to some deranged state of the maternal health—As they can be traced to some morbid condition of the uterus or its appendages—As they arise from disease of the embryo or its membranes.—3. Symptoms—In early days of gestation—At an advanced stage of pregnancy—Inversion of uterus after abortion.—4. Diagnosis—Distinction between the menstrual flow and the hemorrhage of an early abortion. 5. Prognosis—In first or second months, the danger slight—Hemorrhage the chief source of danger.—6. Treatment—Prophylactic or preventive measures—Plan to be pursued when expulsion appears unavoidable.

1. Introduction.—The abrupt termination of pregnancy by the premature expulsion of the fœtus is of frequent occurrence; the number of mothers who pass through the childbearing epoch of life without aborting once, or even much oftener, being small. Although this accident may be the cause of alarming symptoms as well as of much suffering at the time of its occurrence, and although it not uncommonly proves the source of many months of ill-health subsequently, yet it is seldom directly destructive to the life of the parent. Indeed, the very large quantity of blood which a woman may lose under these circumstances is quite surprising; and no less astonishing is it to witness the rapid way in which, under skilful treatment, she frequently will recover from the immediate effects of the loss.

The expulsion of the ovum may take place at any period of gestation. When it occurs during the first sixteen weeks, it is often spoken of as *abortion;* when between the end of this period and the twenty-eighth week, as *miscarriage;* and when after the latter period, but before the completion of the full term, as *premature labor.* The most simple subdivision, however, and therefore the best, is into *abortion* and *premature labor:* the former comprising all cases which occur before the twenty-eighth week,

or seventh lunar month, inasmuch as the expulsion is invariably fatal to the offspring either previous to or just after birth; the latter including the cases which occur after the twenty-eighth week, when it is possible that the fœtus may, with care, be reared. The terms, "abortion" and "miscarriage" may be conveniently employed as synonymous expressions. Until the present reign, the law discriminated between the crime of producing abortion at an early period of pregnancy, and of doing so in a woman quick with child. Fortunately no such subtle distinction now exists; for, as I have before said, the expulsion of the fœtus or infant by criminal violence, at any period of pregnancy, is regarded as an abortion, and is punishable as a felony.[1]

It is commonly believed that early, especially first gestations, have more frequently a premature termination than subsequent pregnancies. According to the experience of Mr. Whitehead—who, as surgeon to the Manchester Lying-in Hospital, has had valuable opportunities for investigating such questions—this is not the case. On the contrary, he is inclined to believe that "the third and fourth, and subsequent pregnancies, and one or two of the last,—those, namely, which occur near the termination of the fruitful period—are most commonly unsuccessful."[2] Although abortion may occur at any period of utero-gestation, yet it is more frequent at some stages of the process than at others; and, as might be expected, it happens more commonly during the early months than subsequently. This is partly due to the comparatively slight causes which about this time suffice to induce hemorrhage, and consequently expulsion. The uterine mucous membrane, then transformed into the decidua, is very vascular; and blood is readily effused into the space which originally exists between the chorion and the decidua reflexa. Moreover, it seems to me probable that the uterus is more irritable during the first three months than it is afterwards. The following table by Mr. Whitehead shows the respective periods of 602 cases of abortion which occurred under his own immediate observation. It must be stated that each figure in the first column embraces a period of four weeks, extending from a fortnight before to the same length of time after the month indicated. Moreover, as abortions happening earlier than the seventh week of utero-gestation are

[1] See note, chapter ii, section 6, p. 98.

[2] On the Causes and Treatment of Abortion and Sterility, &c., p. 247. London, 1847.

so frequently and closely simulated, both in married and unmarried females, by certain uterine discharges, the result of disordered menstruation; therefore, events said to have taken place at this early period—except those where the escape of an ovum was undoubtedly proved—have not been included in the report.

A Table showing the Period of Pregnancy at which Abortion occurred in 602 Cases, etc.

Period of Pregnancy at which Abortion occurred.	Number of Births at each period.	Number Stillborn.	Number Living at Birth.	Number Living at the end of a Month after Birth.
2 months, . . .	35	—	—	—
3 " . . .	275	—	—	—
4 " . . .	147	—	—	—
5 " . . .	30	—	—	—
6 " . . .	32	24	8	0
7 " . . .	55	38	17	3
8 " . . .	28	23	5	1
Total, . .	602	85	30	4

Of the eight children indicated in this table as having been born alive at six months, seven perished within six hours after birth, and only one attained to the age of ten days. Of the seventeen born alive at seven months, the majority lived over several days, a few to the end of the third and fourth week, and three were alive at the end of nineteen months. Eleven of those born alive at seven months, and three of the five born alive at eight months, perished from disease of a specific nature inherited from the mother. In three of the cases the event was attended with fatal consequences to the mother: one, in which delivery occurred at the seventh month, being a case of placenta prævia, where the expulsion had been preceded for several days by a constant and profuse hemorrhage; one was a case of malignant degeneration of the uterus; while the third was a case of twins, at about the seventh month of their uterine growth, in which delivery was followed by alarming prostration, symptoms of uterine phlebitis setting in, and death taking place on the sixth day.

In cases of premature delivery it is sometimes a matter of considerable importance to determine whether a child was born alive, even though it may certainly have perished very shortly afterwards. This may particularly be the case in contested lawsuits relating to the inheritance of, or succession to, property. The question as to what constitutes a live birth might also be raised. At a meeting of the Obstetrical Society of Edinburgh in 1854, Dr. Keiller exhibited a premature fœtus which was born alive in

the fourth month; and at the same time referred to some recent cases in civil jurisprudence in which the question of live birth was held to be established without any evidence of that which was formerly demanded—respiration or crying. The mere muscular movements of the limbs or the features, independent of any signs of respiration, having been ruled as sufficient evidence of a child being born alive, is therefore now held to be ample enough proof of what is termed in such investigations "live birth." The following are the chief points of interest in Dr. Keiller's case:

On 17th June, 1854, this gentleman was called to Mrs. R., who was about to abort. A miscarriage had occurred a year previously, when seven months pregnant. She now considered herself in the fourth month; having last menstruated on the 8th February, while she quickened on the 8th June. The fœtus was soon born; and as the heart was beating vigorously, together with the vessels of the cord, the fœtal circulation through the attached placenta was allowed to continue some time, in order to observe the reflex movements of the limbs and face and respiratory muscles which took place. At first the muscular reflex contractions were very marked: so that on touching the feet and hands, the limbs were immediately drawn up and moved about. On blowing upon the face, the lower part of it was tremulously moved, and the mouth opened; and three or four times an attempt to respire or gasp, accompanied by an apparently respiratory movement of the chest, took place. On cutting the cord, and allowing about a drachm of blood to ooze from its fœtal extremity, the heart's action immediately became quicker, and one or two thoracic convulsions afterwards followed. The heart's action gradually became more feeble, although pulsations occurred for nearly an hour. The fœtus weighed 9½ oz.; in length it measured 8 inches; and the placenta with attached cord weighed about 6 oz. The eyelids were adherent, the nose and ears closed, and the mouth open; the membrana pupillaris was entire; while on opening the chest, the situation and appearance of the lungs and other organs were characteristic of the apparent age.

It has been already remarked that when the fœtus is expelled before the twenty-eighth week of utero-gestation, it either dies immediately or very soon after birth. Possibly some few remarkable exceptions to this rule can be found; and the following would seem to be one:

In the year 1748 a woman was delivered of a male fœtus, precisely six months after her previous accouchement. The child was puny and weak to excess; it did not cry, and it seemed hardly able to breathe; the eyes were closed; the limbs were flabby and relaxed; and some slight movement, with a warm surface, were the only signs of life exhibited. It was carefully preserved from cold, and fed with a little lukewarm milk; but it uttered no cry, and voided no excrements. At the end of four months the child began to cry, to void excrements, to move its body, to suck, and to grow like other

children. So steady was the improvement, that in about sixteen months after its birth, it surpassed other children of the same age in strength.[1]

The data by which the age of the embryo can be ascertained are deserving of notice; inasmuch as the accoucheur is always expected to give an opinion as to the period to which the intra-uterine life has advanced. The following statements are, however, to be regarded as affording an approximation to the truth, rather than as being unconditionally exact. Hence, in any given case, the physician must form his opinion not from one sign alone, but from a consideration of the majority of the characters which the fœtus presents. The chief points to which I would direct attention are as follows:

From the time of impregnation until the fifteenth day, the embryo is seen only as a minute, semi-transparent, gelatinous, grayish-colored mass; presenting no distinct formation, even when examined by the microscope; and only detected at all with very great difficulty by a lens. Indeed, if the ovum be expelled within six weeks from conception, it is scarcely possible to find the embryo in the great majority of cases, owing to its minuteness, and the coagula of blood in which it is enveloped. Burns examined three uteri within the first month of gestation, where expulsion had not occurred; and yet, under these favorable circumstances, he could not discover the embryo. Probably the earliest embryo which has been seen is that mentioned by Von Baer, in an ovum of about fourteen days.

An embryo of one calendar month weighs about twelve grains, and is six or eight lines long. It has been roughly compared to a grain of barley, or to the common house-fly, or to a small worm curved upon itself. The head is distinguishable, constituting half of the entire embryo; the eyes are placed laterally, and consist of two black points, surrounded by a membranous circle, representing the lids; while the mouth is triangular and wide open, the rudimentary tongue being discernible. The bronchial clefts have not quite disappeared. A quadrangular mark behind and below the upper jaw indicates the situation of the external auditory canal. The brain is represented by a little gray mass; and the rudimentary spinal cord is evident. The extremities are to be distinguished as little leaf-like appendages. The omphalo-meseraic are the first bloodvessels developed; and from these the vena portæ is formed, the heart first appearing as a dilatation of the latter. This dilatation is separated by two contractions into three portions; two parts forming an auricle and a ventricle, and one the bulbus arteriosus—the rudimentary aorta. It has been stated that the pulsations of the heart have been recognized as early as the fifth week at the upper part of the left side of the abdomen. The circulating fluid is at this time colorless. The chorion is smooth internally, and covered externally with small villi; while the umbilical vesicle is large, and connected with the intestine by the ductus omphalo-entericus. This duct, with the vasa omphalo-meseraica which accom-

[1] Essai sur l'Education Médicinale des Enfans, et sur leurs Maladies. Par M. Brouzet. Tome Premier, Note p. 37. Paris, 1754.

pany it, and the pedicle of the allantois, forms part of the umbilical cord, which begins to be developed at about the fifth week. A double sheath, formed by the chorion and amnion, incloses these structures. The urachus, with the umbilical vein and two arteries, constitutes the chief portion of the cord at a later period of gestation.

An embryo of two months weighs from six to eight drachms, is about eighteen lines in length, and somewhat resembles a large kidney-bean. The head is very large. The brain is represented by a series of vesicles: the anterior, small and double, being the cerebrum; the posterior, larger, representing the cerebellum, while in front of this is the vesicle of the corpora quadrigemina, and that of the third ventricle. The eyes are prominent, and partly closed. The lungs, liver, and Wolffian bodies exist. The heart is covered in, and its septum developed. The extremities are quite visible. The first centres of ossification have appeared in the clavicle and lower jaw. These ossific points can be very clearly seen by soaking the embryo for a few days in a solution of caustic soda and alcohol (from five to ten grains of caustic soda dissolved in a little water, to one fluid ounce of alcohol); a mixture which renders the soft tissues transparent; without affecting the earthy particles. The fœtus can afterwards be permanently mounted in glycerine or in diluted alcohol.—By this time the villi of the chorion have become accumulated at one spot, to form the placenta; while the umbilical cord is thick, and the vessels straight, though they now begin to assume a spiral direction. Development henceforth goes on rapidly; the features becoming in part well-marked, and the extremities well-formed. Hence we find that,—

An embryo of three months weighs from one and a half to rather over two ounces, and when stretched out measures between three and four inches. Ossification has progressed at several points; and some of the deposits are of considerable size. The rudiments of the muscles are formed. The head is heavier than the rest of the body. The anterior lobes of the cerebral hemispheres have much increased in size, but there are no convolutions visible. The dental sacs make their appearance in the upper and lower jaws. Each pupil is closed by the membrana pupillaris, and the eyelids coalesce, or nearly so. The mouth is large, with the lips well-formed. The heart is large as compared with the body, the proportion being as 1 to 50, whereas at birth it is as 1 to 120, and in the adult about 1 to 150. The thymus, spleen, pancreas, and salivary glands are visible. The external genital organs are also of considerable size in proportion to the rest of the body, though the sex is not discriminative, the clitoris not being distinguishable from the penis; while the rudimentary kidneys, with the testicles or ovaries are in course of development. The membranes are larger than the egg of a goose; the membranæ deciduæ are in close contact; the umbilical vesicle, allantois, and the omphalo-meseraic vessels have collapsed; and the placenta is distinctly isolated.

A fœtus of four months varies from three to five ounces in weight, and is five to six inches long. The skin is slightly red, and rather dense. The brain is smooth on its surface, there being no appearance of convolution; but the middle and posterior lobes of the cerebrum can be seen. The small ossicula auditûs are ossified. The supra-renal capsules are as large as, or even larger, than the kidneys, the latter being voluminous. The sex is just distinguishable; the retrocession of the clitoris, or the increased development of the penis with the formation of the raphe of the scrotum, beginning to be

apparent. There is meconium in the large intestines. Ossification has much advanced: the shafts of the long bones, rudiments of the vertebræ, and plates of several flat bones are distinct. Moreover, the umbilicus is situated near the pubes; and the chorion and amnion are in close contact all round. Mons. Cazeaux states that while he was Interne at the Hôtel Dieu, he received a fœtus that had scarcely reached the fourth calendar month; but which lived for four hours after its birth.

A fœtus of five months weighs about one pound avoirdupois, and is some ten or eleven inches in length. Its head is in size one-third of the whole body, and has short scattered hair upon it, of a silvery lustre; the eyelids are adherent, and the pupils closed by the membranæ pupillares; while the brain presents slight interlobular depressions. The germs of the permanent teeth may be perceived. The nails are slightly formed. The lungs are small and solid; the heart is still voluminous and beginning to assume an oblique direction instead of being vertical as before, the auricles are larger than the ventricles, and the ductus arteriosus and pulmonary artery are equal in development. The liver is large, while the gall-bladder is perceptible. The muscles are becoming fibrous. There is a slight appearance of fat in the connective tissue. During this month the fœtal movements have become appreciable to the mother.

A fœtus of six months has a weight of two pounds, and is twelve or thirteen inches long. The head is to the body as 1 to 4. The brain is a grayish mass, the posterior lobes of the cerebrum overlapping the cerebellum. The hair loses its silvery lustre, and becomes darker. The eyelids are still agglutinated. Ossification has proceeded to a considerable extent. The lungs are small, solid, and of a reddish color; the heart is rather smaller than before, and the foramen ovale at the lower and back part of the septum auricularum is now at its greatest size. Meconium of a deeper color and more viscous than hitherto, is found in the cæcum. In the male the testicles are just apparent in the abdomen, lying on the psoæ muscles, and gradually withdrawing from the kidneys.

A fœtus of seven months weighs from three to four pounds, and measures between fourteen and fifteen inches in length. The skin is thick, and beginning to be covered with a white unctuous matter; the body is round and plump, from the deposition of fat in the connective tissue; ossification is rapidly advancing throughout the skeleton; and the nails are tolerably firm, but do not reach to the extremities of the fingers. Valvulæ conniventes appear in the small intestines, and meconium is found in the colon as well as in the cæcum. The eyelids are no longer closed, and the membranæ pupillares are less apparent. The liver is of considerable size, the left lobe being almost as large as the right; while the gall-bladder contains bile. The testicles are drawn almost in contact with the abdominal rings. The ancients entertained a conceit that an infant born at seven months could live, while one at eight months was almost sure to die. It is hardly necessary to observe that the capability of living in a fœtus increases in proportion as it advances towards the natural period of delivery; and the propagation of the opposite opinion could only have arisen from the prevalent belief in the harmony and powers of certain numbers with which philosophers were formerly infected. As Haller points out, the Pythagorean number *Seven* was regarded with great favor.

The fœtus of eight months weighs from four to five pounds, and is from sixteen to seventeen inches in length. The quantity of fat beneath the skin

has increased; the hair and nails are well developed; and the sebaceous matter on the skin is more distinct. The membranæ pupillares have disappeared. The surface of the brain is grooved, but the convolutions are shallow or rudimentary. The testicles are found in the inguinal canal or in the scrotum, or the left gland is in the scrotum, while the right is found about the external ring; or the clitoris can be seen through the open vulva.

The fœtus of nine calendar months, i.e., *of maturity*, has an average weight of seven pounds avoirdupois, and an average length of nineteen inches. The breadth across the shoulders is five inches; across the hips, three. The male infant is usually rather longer and heavier than the female.[1] Great deviations in weight and length are sometimes met with. The heaviest child I have noted in the register of my own practice was a male, and weighed twelve pounds four ounces; labor set in at the expected time, at the end of the ninth calendar month; and delivery of the head was accomplished by the natural efforts alone, though there was so much difficulty with the shoulders, that the infant died during the birth. Dr. John Ramsbotham has delivered a woman of a child weighing sixteen and a half pounds.[2] Dr. Bloxam, with Mr. Owens, had a case of difficult delivery, in which the child weighed seventeen pounds twelve ounces, while its length was twenty-four inches.[3] Dr. W. P. Johnson, of the National Medical College, Washington, delivered a patient, 38 years of age, of her fourteenth child, on the 26th November, 1848. The infant, a male, weighed twenty pounds; was 25¼ inches long, 8½ inches broad across the shoulders, and 7⅜ inches across the hips. The placenta weighed 3 pounds. The child was alive when the head escaped, but death occurred before delivery was completed, owing to the pressure on the cord from the difficulty experienced in getting the shoulders and breech into the world.[4] Dr. Waller relates[5] an instance where he effected delivery by the long forceps, after the woman had been thirty-six hours in labor, of a male infant which weighed fifteen pounds fifteen ounces, and the circumference of whose head, measured at the orbital processes, was sixteen and a quarter inches.[5] Dr. Meadows has met with an instance in which a male child weighed eighteen pounds three ounces, and was thirty-two inches long. The infant presented by the breech, and lived for five hours after its birth.[6] While lastly, Mr.

[1] This difference in weight and height between the two sexes continues—except for three or four years—during life. The following table, drawn up by M. Quetelet, well shows the comparative weights of the two sexes:

	lb. avoir.		lb. avoir.
At birth the male weighs, . .	7.05	The female weighs, . .	6.41
At one year of age, ...	20 84	" " . .	19.38
At five years of age, ...	34.78	" " . .	31.67
At twelve years of age, . . .	65.76	" " . .	65 76
At fifteen years of age, . . .	88.69	" " . .	89 03
At thirty years of age, . . .	140.37	" " . .	121.80

And so on, in a corresponding ratio, up to the age of ninety. This exhibits also the effect of the earlier accession of puberty in the female, giving her the advantage between the ages of twelve and fifteen.

[2] Practical Observations in Midwifery. Second Edition, p. 174. London, 1842.

[3] Lancet, p. 477, 22d December, 1838. The sex of the child is not mentioned in the report; but Dr. Bloxam informed me that he believed it was a male.

[4] The American Journal of Medical Sciences. New Series, vol. xxi, p. 340. Philadelphia, 1851.

[5] Transactions of the Obstetrical Society of London, vol. i, p. 310. London, 1860.

[6] Medical Times and Gazette, p. 105, 4th August, 1860.

Davies of Pershore, delivered a woman safely with the forceps, after a lingering labor lasting six days, of a live child weighing nineteen pounds two ounces [1] On the other hand, some children born alive at the full time, have been known to weigh less than five pounds. In a twin pregnancy the weight of each individual fœtus is less than that of a fœtus not a twin, though the combined weight is greater. Dr. Clarke found that the average of twelve twins was eleven pounds avoirdupois each pair; the heaviest couple being thirteen pounds, and the lightest eight pounds and a half.

The head of the mature child is large and well covered with fine hair; the great fontanelle is about three-quarters of an inch in length; the features are perfect; and the limbs plump and firm. The skin is of a clear red color, firm and tense; while it is usually thickly covered with vernix caseosa, which consists of desquamated cells of epidermis and fatty matter. The scrotum is corrugated: or the vulva is closed by the apposition of the labia majora, and there is a hymen. The nails reach to the ends of the fingers, but not to the extremities of the toes. The surface of the brain presents convolutions, though the organ is pulpy, and the difference between the white and gray matter is not very distinct. Ossification has also advanced considerably throughout the whole skeleton; and the muscles, nerves, &c., are firm and well developed. The placenta at maturity weighs from eighteen to twenty-four ounces, the average being one pound five ounces avoirdupois; while it is commonly some eight inches in diameter, and one inch in thickness at its centre. Cases are recorded by Wrisberg and Stein, where this organ has been so greatly hypertrophied as to weigh in one instance three pounds, and in another six. The average length of the umbilical cord is now about twenty inches, though it has been found as short as four, or even shorter; while Baudelocque has seen it measure fifty-seven inches, Gardien refers to an instance where it was five feet, and Dr. G. Thomson, of Boston, U. S., once found it to be five feet nine inches. The greater the quantity of gelatinous matter in the interspaces of its fibrous tissue, the thicker will the cord be. The funis has been found attached to other parts of the body besides the umbilicus: Meckel says he saw a preparation in the Anatomical Museum at Brussels where it arose from the head of the fœtus. It may also be found knotted in one or more places, and coiled round the fœtal body; or so tightly wound round one of the extremities as to cause atrophy, or perhaps even amputation of the limb.

The new and painful sensations experienced by the child on passing into the world from the warm body of the mother, cause it to make certain efforts, which end in inspiration and crying. The lungs thus become thoroughly inflated, and the circulation of the blood through the pulmonary vessels supersedes the use of the foramen ovale and ductus arteriosus. So also, the blood from the lower extremities being unable to force its way along the umbilical arteries, passes through the ascending vena cava into the right auricle and ventricle, and so into the lungs, to be purified and redistributed. By degrees the foramen ovale closes; the ductus arteriosus, ductus venosus, and umbilical arteries are obliterated; and the normal circulation is permanently established.

[1] Medical Times and Gazette, p. 249, 8th September, 1860. The child's sex is not mentioned in this report; but by a note from Mr. Davies I learn that it was a male. The patient thought she had gone a little over her time, though nothing exact can be gathered from her statements.

Granting that an infant—as a general rule—is not destined to reach maturity before the end of nine calendar months, the question has sometimes been raised as to the shortest period at which a perfect, full-grown infant may possibly be born. Leuret and a few other writers have maintained that infants occasionally reach maturity of development as early as the end of the seventh month; but I know of no experienced modern author who in any way supports this opinion. Were it true, it might not unreasonably be supposed that a child so prematurely developed could by accident be sometimes brought into the world at the fifth calendar month; and it ought then to have an equal chance of life with an ordinary seven months' infant. But is there any practitioner living who has ever met with an instance where a fœtus born at the fifth month has been reared? It is true that the following case has been recorded by Professor John W. Francis, of New York; but it is far from satisfactory, inasmuch as the scientific reasons for believing the age of the fœtus to be only twenty-three weeks are not given. The particulars are these:

Mrs. B. was delivered, after protracted sufferings, of a dead male child. Twenty months afterwards, in the year 1832, she aborted. By one powerful effort the entire ovum was expelled. Mr. Francis fortunately arrived at this crisis, and had the whole mass immersed in a vessel of tepid water, while he attended to the mother. On afterwards rupturing the membranes, he perceived a fœtus, "apparently of some five months and upwards of growth. The cord was divided, and more than usual care taken with the child; a fillet or ribbon was applied round its head, which seemed unusually large, and the body wrapped in cotton. By unremitting attention on the part of a competent nurse, the fondest wishes of the parents were ultimately realized; and the daughter, in the enjoyment of excellent health, has at the present writing completed her seventh year. Subsequent inquiry with the parents concerned, made the age of this premature offspring at birth a fœtus of the twenty-third week of pregnancy."[1]

Notwithstanding this history, I believe if we allow that thirty-five weeks, or 245 days, is a period at which maturity of development may be reached, we shall be making a statement difficult of proof. But I entertain no doubt that mature infants have been born at 259 days, or thirty-seven weeks. There is, indeed, no sound reason why some few fœtuses should not grow at a greater rate than others. And just as the time of utero-gesta-

[1] A Treatise on the Diseases of Infants. By C. M. Billard. Translated from the third French Edition by Dr. James Stewart. Appendix, p. 612. London, 1839.

tion may sometimes be prolonged perhaps to allow of increased fœtal development, so doubtless it can occasionally be shortened when maturity has been reached in a rather shorter time than ordinarily.

Morgagni and Desormeaux entertained the opinion that abortions with female fœtuses were more common than with males. If this were so, it could only be because the boys born at the full term exceed the girls in number. I can quote no fact, however, in support of the observation; and I do not think, from my own experience, that it is true.

2. The Causes of Abortion.—These are very numerous. By one author or another, almost every action of daily life has been said to be likely to induce it. Hence it is better for the sake of clearness to resort to some classification, arbitrary though such may be. Some writers treat of the predisposing or exciting, and the immediate causes; but there are many objections to this subdivision. Others speak of the causes which act indirectly by destroying the fœtus, and such as have a direct influence by inducing uterine contractions. As the most simple plan, it seems useful to consider the causes under four heads, viz.: (1) As they are accidental. (2) As they are due to some deranged state of the mother's health. (3) As they can be traced to some morbid condition of the uterus or its appendages. And (4) as they arise from disease of the embryo or its membranes.

(1) *The Accidental Causes.*—The most common of these are violent mental emotion, sudden agitation from fright, great bodily fatigue coupled with mental anxiety, and severe pain. Then we find abortion resulting sometimes from the effect of hysteric convulsions, from immoderate laughter, from the straining produced by dysentery and diarrhœa, and from blows and falls; as well as from occurrences generally which suddenly disturb the equilibrium of the circulation, or strongly affect the nervous system, or have a direct tendency to separate the ovum from its uterine connections. Although the uterus is suspended in the maternal pelvis in the way best calculated to prevent its being affected by sudden shocks, yet the connection of the thin and fibrous decidua—this tissue having lost the spongy characters it presented before impregnation—with the uterine walls is so fragile, that slight accidents will sometimes effect a partial sepa-

ration and give rise to the effusion of blood. Should the clot be large, its presence between the uterus and decidua must interfere with the nutrition of the ovum; and hence will soon lead to the death of the fœtus and abortion.

The uterus being in reflex relation with many important organs, it can readily be understood that diseases of the latter are not unlikely to induce uterine contractions. Dr. Tyler Smith has shown that irritation of the mammary nerves may be a cause of the latter; as when abortion occurs during lactation, from the excitation produced by constant suckling. Acting on this principle, Scanzoni has recommended the induction of premature labor to be effected by the application of an exhausting apparatus to the breasts. So again, irritation of the gastric nerves must be cited as a cause of abortion; though it is often astonishing to what an extent—even to such a degree as to cause death—nausea and vomiting may proceed without exciting the uterus to expel its contents. Indeed, some authors go so far as to say that a sick pregnancy never ends prematurely; but for the word "never" it is better to substitute "rarely." Then we must mention irritation of the trifacial nerve produced by cutting one of the late molars, or by the extraction of a tooth; irritation of the renal nerves from gravel, or the employment of cantharides; irritation of the bladder from a calculus, or of the ovaries from congestion and inflammation; and excitement of the nerves of the rectum from hemorrhoids, ascarides, or the injudicious use of such drastic purgatives as aloes and gamboge and senna, &c. Lastly, irritation of the vagina and uterus will occasionally excite abortion: whether the irritation be due to the violent jolting of horse exercise, riding over rough roads, railway travelling, dancing, &c.; or to excessive sexual intercourse, the employment of a vaginal plug or pessary, the growth of malignant or non-malignant tumors from the cervix, or the implantation of the placenta over the os—placenta prævia; or to the administration of certain drugs which act specially on the uterine organs, such as ergot of rye, savin, certain preparations of iron, rue, iodine, iodide of potassium, iodide of mercury, cinnamon, borax, &c.

It is very remarkable to what an amount of injury, from mechanical causes, the body may be subjected without disturbing the functions of the uterus. Thus Mauriceau relates, in astonishment, the history of a woman, advanced to the seventh month

of pregnancy, who fell from a window on the third floor, broke her arm, had great pain and distress from a dislocation, and was severely bruised; and yet gestation continued to the full period, at the completion of which she was delivered of a healthy child. In the present day, almost every hospital surgeon has seen the most frightful injuries recovered from during pregnancy, without causing premature expulsion of the fœtus. Women have suffered from fracture of the skull, extensive abdominal wounds, falls from horses, &c.; they have nearly killed themselves, unintentionally or otherwise, with violent poisons, or with powerful drugs supposed to act specifically upon the uterus; they have undergone all the horrors of shipwreck, with immersion in the water for very many hours; and yet a few weeks afterwards have been delivered of healthy mature children, without more suffering than usual.

Under this head must also be included those cases in which abortion or premature labor is voluntarily excited; either for criminal purposes by some knave, or for some good end by the physician. The appliances adopted by the former for committing intra-uterine murder very frequently endanger the life of the pregnant woman, and sometimes destroy it altogether; while those skilfully employed by the latter, at the call of duty, are not uncommonly the means of saving two lives. It is, however, unnecessary to mention here the different methods which can be employed for causing the premature expulsion of the fœtus, with comparative safety to the mother; since the object of this chapter is to show how abortion may be prevented, not how it should be provoked.

(2) *Causes due to a Deranged State of the Mother's Health.*—It is generally believed that women of a nervous and irritable temperament, who may be prone to great excitement from slight impressions, are more liable to abort than such of their sex as are favored with more equable temperaments. So again, plethoric females, who have the catamenial flow unusually abundant, are likely to miscarry frequently. Women who reside in bleak mountainous countries are said to have their health so affected that they frequently suffer from repeated miscarriages; those inhabiting the summit of the Vosges in the northeastern district of France being so subject to abortion, that—according to Sauce-

rotte—they are in the constant habit of descending into the adjacent plains to avoid this accident.

Acute thoracic and abdominal diseases occurring during the progress of utero-gestation, have a tendency to interrupt it. So likewise epileptic and especially uræmic convulsions have a similar influence. Pregnant women attacked with measles, scarlatina, erysipelas, and typhus or typhoid fever, &c., very frequently abort during the progress of the disorder; either from the direct effect upon the maternal system, or from the fœtus becoming affected with the disease. The occurrence of small-pox during pregnancy is almost certain to produce abortion or premature labor; while in all probability the fœtus will be found covered with the eruption.[1] In chronic pulmonary, cardiac, renal, and liver affections, pregnancy often progresses uninterruptedly until an advanced period. It is especially interesting to notice the fact pointed out by Dr. Montgomery, that when a pregnant woman labors under an organic disease which is to end fatally before the natural completion of her gestation, it almost invariably happens that parturition is delayed until the child has acquired such a degree of development as to be capable of living when born; labor being established, and delivery safely accomplished, a day or two before the mother's death.

I have seen a few cases which appear to prove, that certain cutaneous diseases may occasionally act as the provokers of uterine contractions. A remarkable instance, in which abortion was induced in eight successive pregnancies by the irritation of excessive itching of the skin, has been reported by M. Maslieurat. The details abbreviated are these:

A lady thirty-two years of age, became pregnant for the first time when twenty-one years old. She suffered but little from the disorders incidental to her condition, until the sixth month; when, without any apparent cause, she was seized with intense pruritus of the whole surface of the body. The legs, thighs, and genital organs were first attacked; but towards the eighth month the itching extended even to the palms of the hands and the soles of the feet. The rubbing and scratching which she was compelled to have recourse to caused premature labor; immediately after which the cutaneous

[1] Although there is a marked difference between some of the symptoms presented by small-pox in the human subject as compared with ovine variola, yet in not a few points there may be found a curious accordance. The parallelism is especially seen in the case of the pregnant ewe. For not only is she very apt to abort when under the influence of the small-pox poison, but the dropped lamb is also commonly covered with variolous pustules.

irritation ceased. The patient again became pregnant; and, as before, ailed nothing till the sixth month. Then the itching again returned, and continued until she miscarried at seven months. The same series of events recurred for six times; making in all eight premature labors due to excessive pruritus.[1]

During the early months of pregnancy women are apt to suffer from obstinate constipation, accompanied with tenderness and flatulent distension of the abdomen. Very frequently, during the fourth month, the pressure of the enlarged uterus upon the pelvic viscera gives rise to a mechanical impediment to the evacuation of the bowels; and hence a daily increasing accumulation of fecal matter takes place in the descending portion of the colon. The more liquid parts of the collection thus formed pass away; a dry indurated mass, often of great size, being left. In many cases, a channel gets formed through the centre of this mass; and as fluid excrement mixed with mucus passes down this, and is evacuated in small quantities, at short intervals, the patient fancies and alleges that she suffers from diarrhœa. A proper investigation of the history and symptoms, together with a manual examination, will, however, enable the practitioner to dispel the delusion; for if a hard and lobulated and slightly movable tumor, tender on pressure, cannot be felt about the left inguinal region, still an exploration per rectum will detect the hardened fæces blocking up the passage. The congestion of the pelvic viscera produced by the pressure of the accumulation; the distressing tenesmus, and the violent straining employed to pass the substance; together with the nervous excitement, the vitiation of the secretions generally, and the impediment to the free circulation of the blood in the uterine organs, may very often produce abortion. A poor woman attended by me under circumstances similar to those just detailed, aborted at the end of the fourth calendar month; and very nearly lost her life from the extreme difficulty which was experienced in controlling the profuse hemorrhage that ensued. The hardened fæces, which were subsequently removed from the rectum by the use of enemata and a scoop, were at least sufficient in quantity to fill a quart measure.

The effects of chronic lead poisoning seem to be especially unfavorable to fœtal life. Whether the system of the mother or of

[1] Gazette Médicale de Paris, 15th March, 1848.

the father be tainted with this pernicious metal, the pregnancy is very apt to terminate before the close of the sixth month; the labor being often accompanied with severe hemorrhage. Even when premature delivery does not take place, there is considerable fear of the child being born dead, or with such a feeble constitution that it can only be reared with great difficulty.

But of all the causes of abortion arising from an abnormal condition of the mother's health, I am inclined to think that constitutional syphilis is one of the most common. There is every reason to believe, that the blood of persons which has once been contaminated by the poison of syphilis may be in a depraved condition, even though there are no external signs manifested by the individual. The precise nature of the abnormal taint has not as yet been determined by any of the microscopical or chemical examinations which have been made; and hence we can only judge of it from the effects produced at some later period either on the victim herself, or on her offspring. Females who once suffer from abortion are liable to abort again, and at about the same period of utero-gestation. These subsequent abortions are then said to be due to the *habit* which has been acquired of aborting. Without absolutely denying that this may sometimes be the correct explanation, yet I am convinced that it is not often so. Certainly, most of the cases of so-called abortion from habit which have come under my notice, have really been instances of miscarriage from constitutional syphilis; and they have only clearly proved that so long as the cause remains, the same effects will be reproduced again and again.

There are three principal modes in which a woman can become infected with the venereal poison. The most obvious of these is by contracting a primary sore. The ulcer may have its seat on either of the labia majora, or on the nymphæ; or it may attack any part of the vaginal walls; or it may be situated on the cervix uteri, although this part is very rarely affected. A primary syphilitic sore contracted during pregnancy is not necessarily fatal to the fœtus in utero; but if a mercurial course of treatment be neglected, the child is almost certain to perish and to be prematurely expelled. Some authors have thought that the administration of mercury to a pregnant woman is calculated to produce abortion; but I know of no observations which will bear a criti-

cal analysis in support of their views, notwithstanding that the error has every now and then found advocates since it was originated by De Blegny in 1673.[1] In my opinion it is an important fact which cannot be too strongly impressed on the practitioner, that it is the syphilitic poison which causes the abortion, and not the mercury. In the first edition of this volume I stated, that out of thirty-seven women by whom I had been consulted, who had contracted primary sores at some more or less remote period, and who had been treated in different ways by other physicians, twenty-three subsequently either aborted once or oftener, or were prematurely delivered of dead children. Of the remaining fourteen, one was delivered three times in succession, at the full period, of dead children: seven gave birth to live children who were afterwards affected with constitutional syphilis: five were delivered of healthy children, who were apparently of sound constitution when six months old: and one was delivered of a dead child, by means of the forceps, after a tedious labor. Were it necessary I might now add several cases to the foregoing, corroborative of the inference which has been drawn as to the mischievous effects of the syphilitic poison. But surely no advantage can result from the multiplication of proofs of the truth of what only a few will be found to dispute.

Another way in which it is highly probable that a woman may receive the venereal taint is by direct secondary inoculation; the individual contaminating her having been apparently cured of the primary disease, or perhaps even having been himself only infected by a person with secondary symptoms. Although this method of contagion is denied by many authors, yet I have had some few cases under my care which could only be explained by admitting the truth of this hypothesis: unless indeed the patients practised very great and unnecessary deceit. Dr. Whitehead may be cited as a believer in this theory; and from his writings the following graphic illustration is quoted:

[1] "You are further to observe, that sometimes it happens, that some urgent occasions oblige *Women* to be cured while they are *with Child*, a circumstance which renders the cure very dangerous. But, when this happens, you must take care to treat them with all possible gentleness, and make choice of that time when they are pretty far gone. For a *Fœtus* is too weak to endure the commotions caus'd by *Mercury* and other Remedies: Besides, that it runs the greatest *Risk* of being render'd *abortive*." The Art of Curing Venereal Diseases, explained by Natural and Mechanical Principles. By Nicholas de Blegny, Chirurgeon to the French king. Done into English from the last edition of the French, by J. H., M.D., p. 286. London, 1707.

"A young wife, in her twenty-fifth year, having been married upwards of four years, came under my notice in September, 1850, complaining of deranged general health. She had had five pregnancies, of which the first ended at seven and a half months, the second at three months, the third at seven and a half, the fourth at eight and a half, the fifth at eight and a quarter months, all stillborn and in a state of decay. She was a member of a robust, unailing family, and had never been out of health, to her knowledge, before marriage; but since, had constantly had yellow leucorrhœa, painful menstruation, with all the sympathetic disturbances usually attendant thereon. The whole body of the uterus, and especially its lower section, was enlarged and painful under pressure; the circle around the orifice was a suppurating surface extending apparently within the cervix; and external to this, which was bounded by a defined margin, the cervix was irregularly patched with aphthæ. These appearances led me to suspect that the patient labored under constitutional syphilis, and in delivering the necessary instructions in reference to treatment, I expressed a wish to see her husband. This request led her to guess at my object, and to infer also what my suspicions were respecting the nature of her case, as she began voluntarily to assure me that her husband possessed a strong and healthy constitution, that he belonged to a remarkably healthy family, and that, moreover, he was a man of the strictest moral integrity, and could not be suspected of infidelity. The husband, however, paid me a visit shortly afterwards. He had never suffered from either venereal disease or gonorrhœa in the primary form. He frankly confessed, however, that he had incurred the risk of infection some months before marriage. A few weeks after the occurrence alluded to by him, he had an ulcer on the lower lip, near the right angle of the mouth: it was broad and deep, and the surrounding parts were extensively inflamed, hard, and painful. The sore proved refractory, and on being shown to a late eminent surgeon, Mr. R. Thorpe, it was pronounced venereal, and was prescribed for accordingly. When presented to my inspection, the peculiar aspect of the cicatrix, with its adjoining brown, wavy margin, together with a suspicious-looking scaly tubercle on the outside of the left commissure, with the assurance also that he had been frequently troubled with spots of that kind during several years past, induced me, unknowing at the time all the preceding details, to say that it looked extremely like the remains of an old venereal sore. The patient's medical attendant, dissatisfied with my opinion, took him to one deservedly celebrated for his knowledge in these complaints, who likewise pronounced it the remains of a venereal sore. In this case the disease, undoubtedly imbibed by secondary inoculation, and in the same form continued, had existed at least five years: its virulence was no way weakened by time, as the constitution of the wife was greatly enfeebled, and the evil in her seemed to be increasing daily. Both patients were several months under my care; they appear to have recovered perfectly under the anti-venereal treatment adopted."—The wife has since borne four living children.[1]

The third means by which the maternal system gets infected consists in the propagation of the poison from the fœtus to the parent. Thus a father begets syphilitic children, who while in utero contaminate the mother. It has been clearly shown by

[1] On the Transmission from Parent to Offspring, of some forms of Disease, and of Morbid Taints and Tendencies. Second Edition, p. 243. London, 1857.

Mr. McGillivray, of Huntly,[1] and has been proved to demonstration by Mr. Savory,[2] that while, as all allow, a portion of the mother's blood is continually passing by absorption (and assimilation) into the body of the fœtus, in order to effect its nutrition and development; so also a portion of the blood of the fœtus is as constantly passing, in like manner, into the body of the mother. Thus as the fœtal blood commingles with the general mass of the maternal blood, it inoculates the mother's system with the constitutional qualities and peculiarities of the embryo; and as these qualities are in part derived by the fœtus from its male progenitor, the peculiarities of the latter are thereby so engrafted on the system of the female, as to be communicated by her to any offspring she may subsequently have even by other males. Of course with each successive fecundation by the impure father, the mother's health deteriorates; for on each occasion she receives, as it were a fresh charge of the poison from the ovum, which is added to that already accumulated in her system. I have recorded elsewhere a rather striking example of this means of contamination. The chief points in the history are briefly as follows:

In 1851, a healthy lady was delivered of her first child: the infant was strong and hearty, has never since had any particular illness, and is now alive and well. During the puerperal period, the husband contracted a sore from a prostitute, for which he was profusely salivated. The ulcer quickly healed: but two months afterwards secondary symptoms appeared, and mercury was again freely taken. Being nervous as to the consequences, he did not have connection with his wife for nearly seven months from the date of his last cure; at the time of intercourse he was perfectly free from the slightest indication of any taint. The wife then became pregnant, and was prematurely delivered of a dead child. Again and again this happened, until she had been delivered of five premature still-born infants. With each pregnancy her mental and bodily health deteriorated in a marked degree, and at length she applied to me on account of her wretched condition. Under the influence of mercury she very much improved; and then becoming pregnant, was delivered at about the close of eight calendar months of a healthy-looking child. At the end of a fortnight this baby was attacked with all the symptoms of constitutional syphilis; and though apparently cured by mercurial inunction, yet it died suddenly in the mother's arms some weeks afterwards.[3]

[1] See a series of papers On the Fœtus in Utero, as Inoculating the Maternal with the Peculiarities of the Paternal Organism; and on Mental States in either Parent, as Influencing the Nutrition and Development of the Offspring. By Alexander Harvey, M.D., Physician to the Aberdeen Royal Infirmary. Monthly Journal of Medical Science. Edinburgh, October, 1849, October and November, 1850.

[2] An Experimental Inquiry into the Effect upon the Mother of Poisoning the Fœtus. Pamphlet. No date.

[3] The Transactions of the Obstetrical Society of London, vol. i, p. 132. London, 1860.

When the venereal taint in the father is slight, the mother may not become affected for a considerable time. In January, 1859, I was consulted by a lady about her own and her young infant's health. The history given to me was this:

She was thirty-seven years of age, and had been married three and a half years. Her health had been uniformly good until two months previously, while her husband was strong and hearty. She was delivered of her first child in July, 1857: it was small and thin at birth, and died of wasting and an eruption about the buttocks, three months afterwards. The second child was born in March, 1858: though premature, it was then healthy, but it soon became much emaciated, and died in the following July. The third child was born on the 23d December, 1858: it remained healthy for fourteen days, when it began to suck with difficulty, and a scaly eruption appeared around the anus. When brought to me on the 21st January, 1859, it had all the symptoms of constitutional syphilis; but a cure was soon effected by mercurial inunction. The infant was weaned at the same time, and was reared on cow's milk alone, which always agreed remarkably well with it, so that by December, 1859, he was a fine and well-grown child. The mother was pale and thin; she complained chiefly of languor, loss of appetite, great restlessness at night, and of an abundant yellow leucorrhœal discharge. The cervix uteri was found hypertrophied and tender, while the labia were indurated and marked with patches of aphthous excoriation. The treatment was not commenced for some weeks, owing to objections on the part of the husband; but ultimately it consisted in the prolonged administration of the solution of perchloride of mercury, and the occasional application of the nitrate of silver to the excoriated surface of the lips of the uterus. Although she was thus cured, still it was feared that the relief would not be permanent; inasmuch as the husband believed himself to be in sound health, and therefore refused to undergo any treatment.

The subsequent progress of this case bore out the foregoing unfavorable prognosis. On the 21st April, 1860, I delivered Mrs. H. of her fourth child. On the 1st May, the infant exhibited the usual proofs of contaminated blood. The little creature had "the snuffles;" there was an erythematous eruption around the anus, and on the buttocks; the skin was harsh and dry; and the breast was refused. By treating the child with mercurial ointment applied over the abdomen, and by getting it suckled by a healthy woman, a cure was effected. The mother, I believe, has not since been pregnant.

(3) *A Morbid Condition of the Uterus or its Appendages the cause of Abortion.*—The ovum and the uterus being developed simultaneously by forces peculiar to each, any inequality in the growth of the two must be mischievous to the former.

The existence of old inflammatory adhesions between the uterus or its appendages and the other pelvic viscera is often a cause of persistent sterility by producing some uterine or ovarian displacement. But when pregnancy occurs, perhaps long after

an attack of inflammation of the pelvic serous membrane has been cured, it is not unlikely to terminate prematurely. If the peritoneal adhesions be slight, they may perhaps get ruptured as the uterus enlarges; the patient will suffer from severe hypogastric pains, especially during the second and third months, and there is sure to be very troublesome sickness. These dangers surmounted, however, the course of gestation will proceed favorably after the uterus has risen out of the pelvis. It is only in those instances where the adhesions are firm, or where the uterus is immovably fixed, that abortion is to be feared; the adhesions preventing the development of the pregnant uterus beyond a limited point. In such cases the miscarriage often takes place about the end of the second, or some time during the third month. The expulsion of the embryo is preceded frequently by copious hemorrhage; while it is apt to be followed by acute metritis, or renewed pelvi-peritonitis, or pelvic cellulitis. The inflammation thus lighted up seldom ends fatally; although the symptoms are alarming at the time, and often enfeeble the system considerably. When the constitution is bad, an abortion with these complications is liable to be followed by months of bad health, which may even terminate in phthisis.

There are many reasons for believing that an excessive rigidity or an unusual sensibility of the uterine fibres, may prevent gestation progressing to the full term; these causes being most likely to have this untoward effect in primiparæ. Congestions and acute inflammatory diseases of the uterus or ovaries may also cause the death of the fœtal germ soon after conception; and so perhaps will inflammation and ulceration of the mucous membrane covering the cervix uteri, or of that lining the cervical canal. Ulcerative lesions of the uterine neck, whether simple or specific, are sometimes a cause of sterility; but when they do not prevent conception, the ulcerations are apt to be rendered more severe and irritable by pregnancy. In about one-third of the cases of cancer of the uterus the child dies and is prematurely expelled at the sixth or seventh month. When the abortion is due to chronic inflammatory induration and hypertrophy of the cervix, the expulsion of the ovum is generally preceded by very copious and intractable hemorrhage; owing to the difficulty with which the thickened os uteri dilates to allow the ovum to pass.

Retroversion of the uterus sometimes occasions abortion; owing to the great congestion of the uterine veins, as well as of all the neighboring viscera, which results from the pressure of the organ on the unyielding walls of the pelvic cavity. This displacement is very likely to happen prior to the time of quickening from the straining exerted to expel hardened fæces, especially if any great accumulation has been allowed to take place. The mass in its descent is violently impelled against the fundus of the uterus, thus forcing this part into the hollow of the sacrum; while the lower part of the body and cervix is tilted up directly under the arch of the pubes. When the accident occurs suddenly, the patient experiences great pain from her immediate inability to void urine owing to the pressure of the womb upon the neck of the bladder; but if the change in position be more gradual the bladder can be partially emptied, and the inconvenience from the retention is much less urgent. Unless the uterus be replaced, however, and the bladder relieved by the catheter, inflammation and sloughing and uræmia are very likely to ensue, and to end fatally.

Prolapsus of the uterus, by impeding the circulation of the blood through the pelvis, and irritating the rectum and bladder, may give rise to venous congestion of the uterine walls, the effusion of serum, and the consequent separation and expulsion of the ovum. So also fibroid tumors of the uterus, by opposing the due development of this organ, have caused abortion; and large abdominal growths of every kind have had a like effect. And lastly, all chronic diseases of the uterine appendages which can, either directly or indirectly, induce irritability of the muscular fibres of the uterus, or impede their free growth, may prematurely determine the arrest of gestation. Hence ovarian tumors, dropsy of the Fallopian tubes, follicular ulceration of the vagina, gonorrhœa, &c., may act as causes of abortion.

(4) *Disease of the Fœtus and Placenta the cause of Abortion.*— It is now a recognized fact, that the fœtus is liable to almost every form of disease which may attack the new-born child; and it is remarkable that many of these morbid states, as well as such as invade the placenta, are apt to recur in the same woman in successive pregnancies. These affections, though not necessarily fatal to the fœtus, are always more disastrous in proportion to the early period of gestation at which they occur. Whatever cir-

cumstance causes the death of the ovum, will almost inevitably produce abortion; although the latter very seldom takes place immediately upon the supervention of the former. When disease ends fatally at an early period of fœtal life, it may either do so without leaving any anatomical changes by which its nature can be recognized, or the process of putrefaction will perhaps have masked the morbid appearance; and even at a later period the immediate effect will possibly have been such upon the whole organism, that there has not been sufficient time for any appreciable circumscribed lesion to take place. During the early months of intra-uterine life, the liver and intestines suffer most frequently from disease: at a later period, hydrocephalus, hydrothorax, pulmonary lesions, peritonitis, ascites, syphilitic eruptions, and strumous deposits, are the prevalent affections; whilst during the last two months of gestation there is scarcely a disorder with which the unborn infant may not be afflicted.

Hereditary diseases can be transmitted by the father or by the mother. With regard to the father, it was formerly doubted if his disorders were communicable to the offspring; but repeated observations have decided this question in the affirmative A vitiated spermatic fluid, such as that derived from a man whose health has been broken down by a long course of dissipation; or a secretion corrupted by a syphilitic, or strumous, or tuberculous taint, undoubtedly communicates a morbid principle to the new being, which is almost sure, sooner or later, to destroy it. Many physicians have also thought that intoxication, great fatigue, or mental depression at the time of coition, have a very injurious effect on the physical development of the embryo.—The maternal diseases which may affect the child in utero are very numerous. The most remarkable of these are typhus and typhoid fever; the exanthemata; phthisis and scrofula; syphilis, &c. When the mother suffers from cholera, the fœtus seldom escapes; but whether the latter dies from the direct influence of the epidemic, or from the pressure exerted on the uterus by the cramps and contractions of the abdominal muscles, or from the nutritious materials afforded by the mother becoming dried up in consequence of the excessive evacuation, is uncertain. The mother and fœtus sometimes suffer contemporaneously from variola; or the former may experience an attack of modified, while the latter has natural small-pox. The fœtus may also recover from

the disease, and be born with the pits alone remaining. In other cases, the body of the mother seems but to serve as the conductor of the morbid agent, she herself being unaffected by it. Thus women who have been years before affected with small-pox, or been well vaccinated, have—shortly after exposure to contagion —given birth to infants marked with variolous pustules; the maternal system having remained quite healthy. Dr. Jenner has recorded many cases of this kind. So, again, a few writers have asserted that during the prevalence of cholera, infants in utero have perished from its influence, without the mothers being attacked at all; and though the proofs brought forward to support this opinion are not very convincing, yet the observation is not to be rashly rejected. Numerous examples of congenital measles and scarlet fever are recorded; while two or three writers have described instances in which the poison of malaria has reached the fœtus and given rise to intra-uterine ague. In one striking case, the fœtal rigors were perceptible both to the mother and others during the fit; but it was remarkable that the periodic attacks of shivering did not occur at the same time as those of the mother, who also labored under the disease.

One of the most fatal of fœtal diseases, without any doubt, is syphilis. The observations already made upon this head render further comment almost needless. Still it may be said that the following are the chief morbid appearances found after birth in these cases: A copper-colored cutaneous eruption, generally most marked about the perineum, or upon the palms of the hands and soles of the feet; abscesses in the lungs, or indurations of portions of the pulmonary tissue; diffused or circumscribed suppuration of the thymus gland; the infiltration of an albuminous fluid into the parenchyma of the liver, disconnecting and deranging its proper secreting structure; and lastly, the presence of numerous pemphigoid vesicles, having a blue or violet tinge, and being seated on the palmar or plantar regions, is stated to be a veritable indication of syphilis, though one of its most rare phenomena.

The various serous membranes of the fœtus would appear to be particularly susceptible to attacks of acute inflammation; which attacks very frequently terminate fatally. Pleurisy, pericarditis, and acute or chronic inflammation of the arachnoid leading to hydrocephalus, are not uncommon diseases of intra-uterine life. But the peritoneum seems to be the membrane

most frequently affected; and in stillborn infants, expelled prematurely, we can often detect evidences of the severity of the inflammatory action in the patches of coagulable lymph, the adhesions between the convolutions of the intestines, the effusion of serum or pus, or the marks of ulceration, to either or all of which it may have given rise. Very rarely, morbid appearances are found indicating that pleurisy and peritonitis have both been present; or the latter may have existed with pericarditis, or with hepatitis, or with pneumonia, or with ascites. The inflammatory process may have been confined to one or more spots of the peritoneum, or the whole surface of this membrane may have been invaded; it is also remarkable that in most of these cases the mesenteric glands are found hypertrophied, though free from any morbid degeneration. It is difficult to say what are the causes of inflammation in the fœtus. Sometimes, no doubt, it is due to a special morbid state of the mother's health; but frequently it originates in, and is confined to, the organs or tissues of the fœtus itself, being quite independent of any peculiar condition of the maternal system. Several instances are known where an imperforate urethra has given rise to such excessive distension of the fœtal bladder, that the latter has ruptured; the urine becoming extravasated into the abdominal cavity, and setting up intense inflammatory action in the peritoneum. So again, peritoneal inflammation seems sometimes to have been due to an internal strangulation of the intestines. Sir James Simpson relates two instances where coagula of blood in the abdominal cavity, from a partial laceration of the substance of the liver, appeared to have excited it; while occasionally it has been connected with some malformation of the abdominal viscera or parietes. Our knowledge of the symptomatology of all intra-uterine diseases is most imperfect; but with regard to peritonitis in particular, I know of no signs by which its existence can be diagnosed. One combination of symptoms seems to attend most severe fœtal diseases; viz., a great increase in the strength and frequency of the child's movements, appreciable to the mother. They are attended sometimes with spurious pains. And they have this peculiarity—that they generally cease suddenly and permanently. Beyond this we really know nothing. Peritonitis is believed with reason to affect the fœtus most frequently during

the two latter months of gestation; and it is commonly fatal, though children have been born alive while suffering from it.

In twin pregnancies, when one fœtus happens to be acephalous, the progress of gestation is often interrupted. Of forty-seven cases referred to by Tiedemann, the labor was premature in thirty-three. Of eleven examples mentioned by Dr. Hohl, of the University of Halle, in three parturition took place at the full period; in one, at the sixth month; in four, at the seventh; in one at the eighth; in one, at the ninth; while in one it is only said that the woman did not go to the full term. The most perfect child is born first, the foot being often the presenting part; and the acephalous monster generally follows in from half an hour to ten or twelve hours.

Organic alterations of the membranes, especially vesicular or hydatidiform disease of the chorion, and inflammatory affections of the amnion, may destroy the fœtus; the effusion of blood into the parenchymatous substance of the decidua will perhaps have the same effect; knotting of the funis, or compression of it from torsion, by impeding the circulation, can produce a like result; and so also may diseases of the placenta. The latter organ, which Lobstein called a physiological lung, and which Harvey termed the nutrient organ of the embryo, as the mammary gland is of the infant, performs the most important offices in the vital function of sanguification. Literally a mass of bloodvessels, there is —as Dr. Robert Barnes remarks—no other organ in which such active and diversified processes of hæmatosis are carried on; not even perhaps excepting the lungs, spleen, and liver. All the blood of the fœtus is successively brought by the umbilical arteries to the placenta; where it exchanges, with the maternal blood, its waste materials for fresh alimentary matter. These changes are wrought through the apposed walls of the utero-placental arteries and veins or maternal portion of the organ, and the branches of the umbilical arteries and vein or fœtal portion. By such changes the placenta is made the final emunctory channel, as well as the prime restorative source; and hence its physiological and pathological conditions must exercise the most important effects upon the economy both of the mother and fœtus.

The morbid conditions to which the placenta is liable, during its stages of formation and growth and maturity, are numerous and important. Thus it may become hypertrophied, or indurated,

or partially calcified, or ossified; while in other cases its textures undergo the opposite processes of atrophy, or of softening. Then, this temporary organ occasionally gets affected with inflammation, a condition technically known as placentitis; it may be the seat of partial congestions and extravasations of blood, the so-called placental apoplexy; or crude tubercles may be deposited on its surface. All of these conditions have to a greater or lesser degree the like effect of interrupting or vitiating its functions; for unless the structure of the placenta be uniformly soft and spongy, and its adhesion to the uterus perfect, hemorrhage must usually result. Then, the partial disruption will extend, uterine contractions will be excited by the effusion of blood, and the ovum will be expelled. Dr. Robert Barnes has elucidated by means of the microscope, and has ably described in some important papers,[1] an abnormal condition of the placenta—fatty degeneration—which is not unfrequently connected with the death of the fœtus, both in the earlier and later months of gestation. The fatty matter is found chiefly in the cells of the fœtal villi, and in the coats of their bloodvessels. In some instances, the morbid change seems to invade the entire decidual surface of the placenta with great uniformity; but in others, only portions are affected, some parts being far gone towards disorganization, whilst in the remaining portions the villi continue comparatively healthy. The cases observed by Dr. Barnes furnish illustrations of the influence of fatty degeneration in causing abortion and hemorrhage: the first being produced by the disease rendering the villi unfitted for their office of maintaining the nutrition of the embryo; the second, by the affected portions of the placenta ceasing to be spongy and yielding, by the vascular channels between the placenta and uterus becoming more or less obliterated, and by there resulting in consequence a disposition to detachment at the diseased points. If the detachment were strictly limited to these points where little or no vascular connection with the uterus remains, there would be no flooding; but this can seldom be the case, for the detachment of the diseased lobes is almost sure to entail partial separation of portions still maintaining a freer vas-

[1] Medico-Chirurgical Transactions, vol. xxxiv, p. 182; and vol. xxxvi, p. 143. London, 1851 and 1853. See also some valuable articles on Diseases of the Placenta, by Dr. Barnes, in the British and Foreign Medico-Chirurgical Review, vol. xiv, p. 21; vol xv, p. 156; and vol. xvii, p. 138. London, 1854, '55, and '56.

cular connection, and thus hemorrhage cannot be prevented. The loss of blood also may be the immediate occasion of the expulsion of the ovum: or the death of the embryo will give rise to irritation similar to that produced by any other foreign body, and so excite contractions of the uterus.

When, from any diseased action the fœtus perishes, an interval varying from five or six to twenty or more days usually elapses before it is expelled. During this time, slight symptoms of impending abortion are generally present; and in order that our treatment of these may not be altogether empirical, it is very important that we should know whether the fœtus be alive or dead. To the medical jurist such knowledge is not unfrequently quite indispensable; as when a pregnant woman has been maltreated, and her unborn infant is thought to have died from the injury. Moreover, in many cases of difficult labor it is very desirable that we should be able to decide this question. To take merely one example: Where the choice has to be made between the performance of craniotomy, the application of the forceps, or the operation of turning, it can be taken for granted that most practitioners would resort to the first proceeding, as being the least painful and dangerous to the mother, were it only quite certain that the child was dead. Hence the following observations on *the Signs of the Death of the Fœtus* will hardly be deemed out of place.

The signs generally enumerated as indicating death before labor are these: A complete cessation of the fœtal movements; a diminution in the size of the abdomen, and a loss of its firm rounded appearance; an absence of that tense elasticity of the uterus, so peculiar to healthy pregnancy; a sensation of coldness and dead weight in the abdomen; the impression as of a heavy mass rolling about the uterus, or the falling of the uterine tumor from side to side in the abdomen, as the patient changes her position; the breasts losing their firmness and becoming flabby; and occasionally the occurrence of a slimy, whitish-yellow, or slightly sanguinolent discharge from the vagina. The escape of a fetid discharge is very frequently said to be a common sign of the child's death; but the absence of such a flow is no proof that there is vitality, for a lifeless fœtus may remain in the mother's womb for many weeks without the putrefactive process setting in, provided the membranes remain entire. In the case of twins,

where one infant dies at an early period of gestation, it is often retained and expelled undecayed when its fellow is born at maturity. None of the foregoing symptoms alone can do more than give rise to slight suspicion. But taken collectively they are valuable; more especially if corroborated by the existence of languor and debility, nervous irritability and mental depression, loss of appetite, disordered bowels, and sunken eyes with the formation of a deep leaden color beneath them. At the same time it must be remembered, that women have been known to carry a dead child for weeks without presenting any one of the foregoing symptoms; while their general health has become much improved, owing to the cessation of some of the sympathetic disorders of pregnancy. As the detection of the double sounds of the fœtal heart affords the surest sign of pregnancy, so the inability of an experienced auscultator to hear them, after a thorough or repeated examination, is the most valuable proof of the child's death; a proof which may be regarded as almost conclusive during the last few weeks of pregnancy, when I believe that careful auscultation can otherwise scarcely fail to discover the comparatively strong tictac of health.

The symptoms during labor which may be regarded by the physician as diagnostic of the child's death are various; but none have the same importance as the inability to detect the sounds caused by the action of the heart. In head presentations the scalp is found loose and flabby, the great fontanelle is depressed and lax, and the bones of the skull overlap each other more than during life; while when the fœtus has been dead some time and is putrid, the cranial bones are felt to be movable within the scalp, something like loose shells in a bag. Where there is a face presentation the lips are flabby, the jaws do not close if the finger be insinuated within the mouth, and the tongue is felt flaccid and motionless. If the breech be the presenting part, the sphincter ani is found relaxed, it does not contract on the finger passed within it, and sometimes there is an escape of meconium. With an arm presentation, the limb is perhaps discovered quite flabby and moist, instead of swollen and livid as when the child is alive; while the cuticle may be abraded or even extensively separated. And lastly, in prolapse of the funis there is a complete absence of all pulsation in the umbilical vessels, if the infant be dead; this fact being ascertained not by a momentary

examination, but by a careful exploration, so as to be sure that the pulsations are not merely suspended, but that they have absolutely and entirely ceased.

3. The Symptoms of Abortion.—The symptoms vary somewhat according to the cause of the miscarriage, and the period of pregnancy at which it occurs. During the early days of gestation the phenomena are scarcely more noticeable than those which happen in many cases of dysmenorrhœa. A few bearing-down pains are experienced, there is some amount of physical and mental depression, the patient makes complaint of more or less aching in the loins and about the sacrum, and sooner or later the ovum is expelled whole or in shreds. Not unfrequently the mass is mistaken for a clot of blood, and is at once thrown away; the woman merely imagining that her monthly flow has been more abundant, and attended with greater pain, than usual.

The case is different at a somewhat more advanced stage of gestation, when the pregnancy is interrupted by some element operating slowly—such as chronic fœtal or maternal disease. The mother first suffers from lassitude and depression of spirits, loss of appetite, thirst, nausea, palpitations, cold extremities, with perhaps attacks of faintness. She experiences a sense of weight and chilliness in the lower part of the abdomen, with irritability of the bladder. The breasts become weak and flaccid; and there is a constant heavy aching sensation in the back and loins. Two prominent symptoms may then be noticed—viz., hemorrhage and uterine pain; either of which will now and then exist alone without disturbing the process of gestation, though when both occur together the ovum is almost sure to be expelled. If a vaginal examination be instituted while a pain is on, in a case where pregnancy has advanced up to or beyond the fourth month, the uterus can be felt to contract or harden sensibly; the rigidity diminishing as the pain ceases. Perhaps, too, the os will be found open, and the membranes beginning to protrude; and then the practitioner may be certain that only a short time will elapse before the escape of the waters and the expulsion of the fœtus with its placenta. In some cases the hemorrhage proceeds to a serious extent for two or three days before the ovum comes away; or if the embryo should pass and the placenta be retained, a constant and exhausting bleeding will be kept up until the

latter is discharged spontaneously or removed by art. It cannot be too strongly impressed upon the practitioner that in most instances of threatened abortion a vaginal examination should be gently made, with the finger well lubricated, in order to form a positive diagnosis. Such an examination, properly conducted, cannot—as some have said—produce that expulsion which it is the object of our art to prevent. Supposing the os and cervix uteri be detected sufficiently patulous to admit two fingers easily; or provided the cervix be found so obliterated that on passing the finger over the lower segment of the uterus no neck can be distinguished; or should the ovum be felt projecting down the cervix or partly protruding through the os,—in either case it will be worse than useless attempting to stop the expulsive process. For in instances of this kind it is evident, that the ovum is at least partially detached from its connection with the uterus; and assuredly the patient will not be safe until the whole product of conception has come away.

When the abortion is the result of some accident—*e. g.*, a fall, blow, or sudden fright—the violence is generally at once followed by a sharp pain in the abdomen and by hemorrhage; while in some cases the ovum comes away almost with the first gush of blood. Of course the earlier the pregnancy, the more likely is the last-mentioned result to happen; for it may be again stated, that at an advanced period of gestation a certain interval almost always elapses between the accident and the abortion, during which the patient—having recovered from the immediate shock—is often apparently nearly well.

In cases of premature labor, the process of parturition is seldom as regular and rapid as in labor at the full term. This circumstance will be easily understood by remembering the length and hardness of the cervix during the seventh and eighth months, the slowness with which the os then dilates, and the comparatively feeble contractile powers of the uterus. On the other hand, the effect of these conditions is somewhat diminished by the smaller size of the offspring, and the greater ease with which its tissues may be compressed. The longer the interval which elapses between the death of the child and the labor, the less also will be the risk of serious flooding; for since the child's death lessens the activity of the uterine circulation, and perhaps partially obliterates a greater or lesser number of the utero-pla-

cental vessels, so the latter bleed but little on the separation of the afterbirth. When the membranes get ruptured at about the same time that the child dies, and labor does not supervene for many days, then the action of the external air on the child's body produces rapid putrefaction. The maternal system in consequence is very apt to become much deranged; high fever probably sets in; and unless the delivery be hastened by art, purulent absorption may take place and prove fatal.

The fact has been already noticed that the death of one embryo in a multiple pregnancy by no means usually leads to its immediate expulsion. But the contrary sometimes, though rarely happens; and abortion of one fœtus takes place, whilst the other continues to grow in the uterus. Dr. Whitehead relates the following interesting example of this occurrence:

A woman of strong mind, thirty-two years of age, and in the seventh month of her sixth pregnancy, was in a grocer's shop ordering some goods, when a heavy weight fell upon the instep of her left foot. She was removed home, in great pain; and whilst sitting with the injured limb in a foot-bath, she felt a sudden and violent struggle within her, followed immediately by a plentiful escape of the liquor amnii. The medical man who was sent for, finding the pains of labor strong and frequent, and a foot already low down in the vagina, proceeded to deliver; and a puny female child was born, alive and apparently healthy. Its left foot, which had been the first to present, was found to be firmly contracted towards the inner aspect of the limb, the heel being raised, and the solei muscles rigid and unyielding; but by the proper employment of extension with bandaging, the use and symmetry of the foot were eventually restored. After some ineffectual efforts to bring away the placenta, the abdomen was examined, when it was found that there was another child, the birth of which was hourly expected. In the course of ten days—no indications of labor coming on—the patient was sufficiently recovered to attend to her household duties, which she continued to do until the completion of the natural term of pregnancy, when she was safely delivered of a full-grown male child, in vigorous health. This event happened precisely sixty-five days after the first birth; and then only did milk appear in the mother's breasts, so that she was enabled to nurse both the children.[1]

M. Desormeaux has also given an account of a very remarkable case in which there must have been a triple pregnancy:

"Une dame enciente pour la première fois à l'âge de quarante ans, fit une faussecouche à deux mois et demi; bientôt après, les symptômes de la grossesse reparurent; des mouvemens d'enfant se firent sentir à l'époque ordi-

[1] On the Transmission from Parent to Offspring of some forms of Disease, &c. Second Edition, p. 21. London, 1857.

naire; a sept mois, elle éprouva une frayeur vive, suivie de phénomènes qui annonçaient la mort de l'enfant; cependant il existait toujours mouvemens dans l'utérus. Enfin, après deux mois, cette dame accoucha d'un enfant mort, et d'un autre qui était vivant et bien portant. Rousset, dans son *Traité de l'Hystérotomotokie*, a rapporté un exemple analogue."[1]

After a miscarriage or premature labor has taken place, the physician must satisfy himself that the whole product of conception has come away. This, it need scarcely be said, he does by making a vaginal examination, and by carefully scrutinizing the aborted mass. So long as any part of the fœtus or its membranes remains in the uterus, the mother is exposed to two great sources of danger. The first and most pressing is the risk to life from flooding, which nothing will check effectively and permanently but the ejection of the retained foreign body; the second source of mischief is the putrefaction of the portion left behind, and in consequence purulent absorption, uterine phlebitis, &c.

The fact must not be forgotten that *inversion of the uterus* may happen after abortion. The occurrence of this accident has generally been considered only possible after parturition at an advanced period of gestation; and in most instances it has been thought to be due to the employment of injudicious force in removing the placenta. These views are, however, somewhat incorrect; for it has happened after miscarriage at the third and fourth month, and in other cases after natural labors where there has been no manual interference of any kind. Three cases—there are probably others with which I am unacquainted—have been published in which inversion of the uterus occurred after abortion at an early period of pregnancy—viz., one by Lisfranc,[2] one by Dr. Skae,[3] and one by Dr. Sidey.[4] In the first, the accident happened at about the third month of pregnancy; and though the woman suffered afterwards from an abundant leucorrhœal discharge, pains in the pelvis and loins, and sympathetic disturbance of the stomach, yet five years elapsed before the cause of her bad health was discovered. The chief points in the second instance are as follows:

[1] Dictionnaire de Médecine. Article, Avortement. Deuxième Edition. Tome iv, p. 466. Paris, 1833.

[2] Clinique Chirurgicale de l'Hôpital de la Pitié, tome iii, p. 380. Paris, 1843.

[3] The Northern Journal of Medicine, vol iii, p. 66. Edinburgh, 1845.

[4] Edinburgh Medical Journal, p. 271. September, 1866.

On the evening of Saturday, 25th January, 1845, Dr. Skae was requested to visit a poor woman, who was said to be very ill in consequence of having had a miscarriage. The patient was thirty-six years of age: had been married sixteen years: had been pregnant eight times, and gone the full period in six: and her labors had never been unduly severe. She was found in a state of great distress and exhaustion; and complaining of severe headache, with intense pain in the back and both iliac regions. She also stated that she experienced constant bearing-down pain attended with flooding, and a sensation of something having fallen down within her. The history was that ten days before, she had been seized with flooding: that on the following day abortion took place, she being four months pregnant: and that two days afterwards she got up to attend to some household matters, but the flooding increased to such an extent as to necessitate her return to bed. She had kept her bed until the 25th January, when at 10 o'clock in the morning she was seized with sickness: while engaged in the act of vomiting, which was severe and continued, she was sensible of something falling down within her; and until Dr. Skae's visit, that sensation continued, along with bearing-down pain, flooding, much general uneasiness, and extreme prostration. On introducing the fingers into the vagina, the passage was found nearly filled with an elongated irregular spherical tumor, of firm consistence, and having shreds of membrane attached to it; while on passing a finger up to the os uteri, the neck of the tumor could be traced entering within it, and having an equally firm attachment, as it were, around the whole circumference of its inner margin. Feeling certain that the mass consisted of the uterus in a state of almost complete inversion, Dr. Skae grasped the organ, and by moderate but steady and continued compression, in the direction of the os uteri, succeeded in about twenty minutes in returning the whole mass. The following day there was a slight projection of the fundus at the os uteri, but it was easily pushed upwards into its proper position. She then gradually recovered, being ultimately restored to perfect health.

The third example was reported to the Obstetrical Society of Edinburgh, on 11th July, 1866. The principal features in the case, as described by Dr. Sidey, are these. This gentleman said:

On the 20th May, I was sent for to see Mrs. G., who was five months advanced in pregnancy, and found her complaining of pelvic pain. On examination, the parts were all very tender, and the os uteri could scarcely be reached on account of extreme tightness. The pain continued till the 24th, when suddenly, without any faintness, there was a feeling of extreme distension and fulness, the abdominal tumor reaching above the umbilicus in the evening. Uterine pains came on, when a large clot was expelled, and within the neck the placenta was felt firmly adhering; no more hemorrhage however occurred. On the 26th, the uterine pains again recurred, and the fœtus and placenta were expelled very much blanched, except the portion which had evidently adhered to the neck and lower part of the uterus. On examination, a large tumor was felt, which proved to be an inverted uterus caused by a fibrous tumor forcing its way through the os. Two fingers of the right hand were passed upwards on the rough surface of what appeared to be the fundus, at the same time pulling the tumor up with the other hand until an

os appeared to have been formed, and the uterus assumed a natural state. Since then she has done well.

4. The Diagnosis of Abortion.—It is often very important that the hemorrhage of an early abortion should not be mistaken for the menstrual flow. One way in which any error may be avoided is by remembering that the catamenial discharge, unless very abundant, does not coagulate, owing to the admixture of the blood with the acid vaginal secretions; and even in severe examples of menorrhagia the clots are seldom very large or firm. In cases of abortion, however, the blood rapidly coagulates, and large solid masses of it may come away. The same thing, it is true, happens in the hemorrhage arising from cancer of the uterus, as well as in that due to the presence of a polypus; but then both these diseases give other indications of their nature which can hardly be overlooked. The effusion of the liquor amnii is also a valuable sign; though it must be remembered that a copious discharge of watery fluid may take place in hydrometra and in hydrorrhœa. Cases have been recorded where pregnancy has proceeded naturally and uninterruptedly for weeks after the complete escape of the amniotic fluid. I cannot, however, help doubting the correctness of some of these histories. Occasionally, no doubt, a portion of the liquor amnii comes away in consequence of a rent or tear in the upper part of the membranes. Moreover, it is possible that the flow in other instances has been due to the discharge of a sort of false amniotic fluid,—a fluid which has accumulated in that space sometimes found existing between the amnion and chorion even to the end of gestation.

Patients not unfrequently imagine that they have aborted and that the ovum has come away, when nothing of the kind has happened. The following case affords a good example of this error; and as the patient's history is instructive in other ways, its full relation may be allowable:

On the 17th November, 1858, I went to Maidenhead to see a lady, in consultation with Mr. Frank Goolden. The patient was twenty-eight years of age, had been married six years, and was the mother of five children. The catamenia first appeared when she was twelve years old: they are usually natural in quantity, appear regularly when not pregnant, and are generally followed by leucorrhœa. She suffers much from hemorrhoids at the monthly periods. She does not seem at any time to have enjoyed very robust health; having especially been subject to relaxation of the bowels, as well as to fits of hysteria and fainting. She is very susceptible to the influ-

ence of mesmerism, and ten years ago was mesmerized every night for three months, to relieve general restlessness and toothache; but being seized at the end of this time with a violent attack of hysteria, this course of treatment was discontinued. All her labors—except the fourth—have been remarkably rapid, and usually attended with but little suffering. She has never been able to suckle any of the children. With her first child she went seven months; she was delivered on the 12th March, 1853, soon made a good recovery, and by care reared the infant. At the end of a few months she again became pregnant; about the sixth week of gestation and again at the twelfth there was a severe attack of uterine hemorrhage, with all the symptoms of abortion, so that she imagined her pregnancy at an end; an opinion, however, which proved to be erroneous, for at the eighth month—on 28th July, 1854—she was delivered of a living child. Several months now elapsed before conception took place for the third time: then at the seventh month symptoms as of approaching labor set in, and continued for two days, but the gestation was not interrupted, and she was delivered at the full period, on 25th January, 1856. For some weeks after getting about she suffered from procidentia uteri, in consequence of over-exertion; but this did not prevent her becoming pregnant about the commencement of May, 1856. At the end of three months from the date of conception she had an attack of flooding, which lasted many days, so that she felt almost certain that she had aborted; and every month until the time of delivery the hemorrhage returned, though it was less abundant. At the full period, on 7th February, 1857, she gave birth to a dead child; but though her labor was attended with considerable flooding, she made a good recovery. Nine months now passed away before she conceived for the fifth time; again experiencing symptoms of abortion about the third month, but nevertheless going her full time. Up to the day of her labor—29th August, 1858—she had no difficulty in getting about, and her health was good. The labor was very rapid, so much so that the child was born before she could be placed upon the bed: the after-pains were also very severe, and she passed many large clots of blood. Ten days after delivery she discovered that she had lost all power in the left leg; and at the same time found, that any attempt to put it to the ground was attended with great pain in the pubic region, which pain also extended down the left thigh. It was owing to the persistence of this loss of power that my opinion was sought.

I found her weak and pale; with a quick and feeble pulse; pretty good appetite; able to sleep well; and free from pain except when the limb was moved. She was unable to lift the left leg at all, but sensation was not impaired; no reflex actions could be excited by tickling the sole of the foot. There was neither swelling nor tenderness about the hip or any part of the limb; the uterus was healthy, and of normal size; the left ovary appeared to me to be slightly enlarged, but only slightly; the bowels were regular, and the evacuations healthy; while the urine was normal in quantity, and free from albumen or any morbid excess of phosphates or lithates. Upon attempting to stand she complained of "a dragging pain in the lower part of the body, as though everything were coming away from her;" and there was then also much pain in the back. In talking these facts over with Mr. Goolden, it was agreed that the paralysis was probably the result of the pressure of the child's head upon the nerves and muscles during its passage through the pelvis; and that in all likelihood the loss of power was kept up by the anæmic condition of the patient. She was ordered small doses of steel;

good nourishing food; to take pepsine if her digestive powers seemed to require it; and to have a gentle galvanic current passed daily through the limb. She was also to avoid becoming pregnant for some months. In spite of the latter precept being unattended to, this lady gradually recovered; and I have since heard that although she experienced her usual symptoms of impending abortion at about the fourth month, yet she went her full time, had an easy labor, and afterwards did well.

From one motive or another abortion may be feigned; or a woman may falsely charge another person with having attempted to commit this crime. Dr. Taylor mentions that a young female was admitted into Guy's Hospital, in April, 1846, who charged a policeman with having given her some substance to produce abortion, and with subsequently having effected this mechanically. According to her statement also, the man had previously had forcible intercourse with her. She was not examined until nearly two months after the alleged perpetration of the crime, when Dr. Lever found that there were no grounds for believing that she had ever been pregnant.[1] The length of time which was allowed to elapse between making the charge and the alleged commission of the offence, afforded presumptive evidence that the crime had not been committed.

I was consulted in 1858 by a woman who seemed desirous to press a similar charge against her husband, with whom she lived very unhappily. Her statement was that the catamenia had been absent for rather more than five months, and that she deemed herself pregnant. Five days before consulting me, she said that her husband compelled her to submit to his passing an iron skewer into the vagina; she experienced great pain, and soon afterwards had a discharge of blood with several "lumps like flesh." On examination, all the organs of generation were found to be healthy: there was no lochial discharge, the mucous membrane of the vagina was of a pale pink color, the uterus did not seem to be enlarged, and it was proved that the cavity was of the natural size by the uterine sound only passing for two and a half inches. Moreover, the breasts were not full, nor were the nipples turgid. The investigation proved to me conclusively that the woman's statement as to her pregnancy was absolutely untrue.

5. The Prognosis in Abortion.—Since the days of Hippoc-

[1] Medical Jurisprudence. Fourth edition, p. 489. London, 1852.

rates the statement has been repeatedly made and credited, that the danger of an abortion is greater than that of a natural labor at the full term. This observation requires some modification, for, as a general proposition, it is not correct. In the first or second month the ovum with its appendages generally escapes without producing any noticeable illness. In the third and fourth months, however, there is often considerable danger from hemorrhage, owing to the rigidity of the os and cervix uteri, and the slowness with which their tissues dilate. The danger again becomes lessened after the fifth month. At all periods the risk will be diminished in proportion to the completeness with which the uterus throws off its contents, and the firmness with which this organ subsequently contracts.

Again, the acute diseases to which lying-in women are liable, are much more severe than any of those disorders which may follow an abortion. It is true that in the latter case some chronic affection of the organs of generation is often left behind which may be troublesome for weeks or even months after the accident; but then there is little or no danger to life to be apprehended from such a disease.

The cause of the abortion must also influence the prognosis. A miscarriage originating through the influence of some slowly operating maternal or fœtal disease is attended with much less serious consequences than one produced suddenly by an accident, or by the exhibition of irritating medicines, or by puncturing the membranes. Tardieu reports thirty-four cases of criminal abortion, the death of the mother resulting in consequence in no less than twenty-two.[1] So, too, an abortion occurring during the progress of an acute inflammation of the brain, lungs, heart, liver, or peritoneum, forms a highly dangerous complication.

The great source of danger in most abortions is the hemorrhage. Although a woman may lose a very large quantity of blood, and yet as a general rule recover, still every now and then fatal cases occur. I have more than once remarked that when a portion, but not the whole, of the ovum and its membranes has been expelled, the patient is very liable to repeated attacks of hemorrhage, from which she may ultimately sink. Mr. Humphreys,

[1] Annales d'Hygiène Publique et de Médecine Légale. Deuxiéme Série. Tome v, p. 145. Paris, 1856.

of Shrewsbury, has related a case which is instructive, and proves how even a very small piece of placenta may cause fatal flooding. The chief facts are these:

A healthy woman, aged thirty-seven, the mother of five children, aborted at the third month, on 28th August, 1858. The loss of blood was not great at the time, and she did not keep her bed. At the end of ten days Mr. Humphreys was hastily summoned to her, and found her blanched and almost pulseless; while the bed was saturated with blood, which was "then pouring out of the vagina in a hissing stream." The vagina was plugged with a silk handkerchief. This was removed at the end of six days, when the canal was washed out with cold water; but an hour afterwards the bleeding returned. The vagina was replugged, and the plug allowed to remain three days. There was no bleeding when it was removed, nor until three days afterwards, when the hemorrhage suddenly recurred. Pressure was made over the pubes by pads and a towel; and she was ordered successively compound infusion of roses with an excess of acid, ergot, acetate of lead and opium, gallic acid, muriated tincture of iron, and turpentine. The uterus was examined and found to be flabby; the end of the forefinger only could be passed into the os. Galvanism was applied directly to the uterus on three occasions; vaginal injections of cold water were freely used; enemata of cold water were frequently administered; and subsequently the uterus was injected with a strong infusion of matico, and then with gallic acid. The bleeding, however, though checked for a time, invariably returned; and at length the patient died, two months after the miscarriage. On examining the uterus after death there was found at the upper part a rugged patch of adventitious membrane the size of a shilling. This membrane was of a very dark color; while on examining it closely, it was found to be made up in great part of vessels with open mouths and sinuses. Evidently, it was a portion of the placenta; which being more than usually adherent at that part, had not been detached from the uterus at the time of the miscarriage. A probe passed readily down the open mouths of the vessels deep into the structure of the uterus. It was with some difficulty peeled off the lining membrane of the uterus, with which it appeared to be perfectly organized.[1]

Sometimes a portion of the placenta remains in the uterus, partly or wholly separated, without producing flooding. It may then undergo decomposition; while if any of the products of putrefaction become absorbed, very severe constitutional irritation will be developed, with all the symptoms of putrid infection. The earliest indication of this condition is a very fetid state of the lochia, and an abundant flow; followed in a day or so by a violent attack of shivering. The rigor is succeeded by high fever, a temperature gradually rising above 100° F., and a pulse beating about 120. There is thirst and nausea; the skin looks sallow;

[1] British Medical Journal, New Series, No. ci, p. 1006. London, 4th December, 1858.

the tongue becomes dry, and thickly coated; the countenance assumes an anxious expression; and there is a throbbing headache, with intermitting attacks of delirium. At the end of from forty-eight to seventy-two hours peritonitis results; and then the abdomen gets greatly distended as well as exquisitely tender, there is constant nausea and vomiting, and often diarrhœa with dark-colored unhealthy stools. The delirium becomes of a low muttering kind, and does not pass off; the debility and restlessness get extreme; the countenance assumes a pinched and haggard expression; and death usually closes the scene at some time between the fifth and fifteenth days from the first invasion of the symptoms. This description, like that of most diseases indeed, applies only to a typical case. Fortunately the sketch can sometimes be drawn in rather brighter colors. The blood-poisoning may be less intense. The peritoneum is not always involved. When the putrid mass gets wholly detached and comes away early, the chances of recovery are greater than where it is expelled only in shreds; but even in cases complicated with peritonitis the result is not necessarily fatal. Yet the patient may succumb although we succeed in early clearing out the cavity of the uterus; or she may recover only after the formation of secondary abscesses, and after going through a period of protracted suffering.

In connection with this subject it is important to remember, that there is sometimes a supplemental placenta—*placenta spuria* or *placenta succenturiata*;—that is to say, a portion of the placenta, of variable size, is so far separated from the main part of the organ as only to be connected by a thin membrane. Should this connection become torn after labor, the placenta might easily come away while the supplemental portion remained attached to the uterus. Hence, without the practitioner being in the least degree to blame, secondary hemorrhage or other untoward symptoms would probably set in, and give rise to considerable trouble.

It occasionally happens that the vascular connection of the placenta with the uterus remains intact after the expulsion of the embryo; or after the death and atrophy of the latter, the afterbirth may continue to be developed. In this way hydatidiform masses and other morbid products called moles are formed; the nature of which will be treated of in the succeeding chapter. Moreover, after the expulsion of the fœtus, complete absorption

of the placenta is said sometimes to have taken place; and cases are related by trustworthy authors where this extraordinary phenomenon has been thought to have occurred. Skeptical as I am about such an event, and believing rather that the organ has really come away in the form of débris, still it cannot be affirmed that absorption is absolutely impossible. But it is certain that even if the possibility of this contingency be granted, nevertheless its occurrence must be so rare that it ought not to be allowed to bias our practice in the slightest degree. Indeed no one will deny, that the chances are innumerably greater in favor of the supervention of flooding or putrid infection from retention of the placenta, rather than of simple absorption.

6. The Treatment of Abortion.—This portion of our subject has to be considered under two heads: (1) The treatment necessary to prevent abortion. And (2) that which is to be adopted when this accident seems unavoidable.

(1) *The prophylactic or preventive measures.*—These consist chiefly in the removal of all causes likely to induce irritation of any portion of the sexual system, and in the adoption of such measures as are calculated to keep the maternal system in a state of good health. When the female is of a plethoric and excitable temperament, everything should be done to insure tranquillity of mind and body. Thus, the diet ought to be light and free from stimulants; and diluents, such as lemonade and soda-water, are to be freely allowed. The bowels must be kept regular—if necessary by mild laxatives. Small doses of digitalis with the solution of citrate of ammonia, or a tincture of the American wild cherry,[1] may often be given with advantage. Regular but gentle exercise in the open air ought to be permitted. Not more than eight hours should be passed in bed; and the patient had better sleep in a well-ventilated apartment, on a mattress rather than on a feather bed, and with light bed-clothes.

For women of feeble constitutional powers, a nourishing diet, the moderate use of wine or beer, warm clothing, daily exercise, agreeable mental occupation, early hours, and tonic medicines, will prove highly beneficial. Aperients are to be avoided. With

[1] Take of,—Tincture of American Wild Cherry, 3 fluid drachms; Solution of Citrate of Ammonia, 12 fluid drachms; Camphor Water, to 8 fluid ounces. Mix and label,—"One sixth part three times a day."

regard to the class of tonics, I have seen the greatest good from the various preparations of cinchona, either with or without the mineral acids; these being preferable, as a rule, to the ferruginous drugs.

In all cases, unyielding stays and tight-lacing are to be forbidden. If the abdominal walls be relaxed, or if they are pendulous from an undue accumulation of fat, or if there be too much space between the recti muscles, great comfort will ensue from wearing a properly-adjusted belt. In aggravated forms, a belt of elastic material is not capable of affording sufficient support; and then a large oval metal plate, either with curved springs such as are used for keeping trusses in position, or preferably with firm bands, will be invaluable. Mr. Heather Bigg has frequently made such instruments for patients under my care; these appliances having proved remarkably effective and singularly comfortable, because so constructed that the wearer is always able to increase or diminish the pressure according to her requirements. Then again, either sponging the lower part of the trunk and the hips with cold water will be useful, or the tepid hip-bath can be employed, especially, where the patient has been in the habit of using it. So also, it will always be as well to advise great moderation with regard to sexual intercourse; while in some instances it may even have to be forbidden altogether. In the latter case, it is generally better to urge the patient to sleep in a bed separate from her husband. These rules are to be more strictly attended to at all those periods when the catamenial flow would be on, were the woman not pregnant; and it is advisable for the practitioner to calculate these dates for the patient, and to tabulate them, so that no mistake may be made. There can be no doubt that the influence of the ovarian or menstrual molimen is felt to a considerable extent by some women during pregnancy, especially in the earlier months. Consequently, every precaution ought to be taken at the times when this influence is in action, to prevent that congestion occurring which is the forerunner of hemorrhage and abortion.

When the disposition to miscarriage is dependent upon a diminished vitality of the uterine system or functional weakness of its nutritive vessels, Dr. Metsch says that tonic and stimulant medicines acting powerfully on the circulation of the uterus are required; and of all such substances savine is the most to be

relied on.[1] The very careful selection of appropriate cases for the use of this powerful drug is necessary; local or general plethora, or serious disease of any internal organ contraindicating its use. If the proneness to abortion depends upon augmented irritability and contractility—a condition not always opposed to the first named—the savine alone does not suffice; and then Dr. Metsch administers the ergot of rye with an infusion of savine. Moreover, if former abortions have been attended with great urinary irritation, this physician recommends the addition of a few drops of tincture of cantharides to each dose of the medicine. For either class, regulation of the diet, abstinence from sexual excitement, and rest in the horizontal position as long as pain is present, are indicated. Although Dr. Metsch relates several cases, in proof of his confidence in the utility of savine and ergot being well-founded, yet I am strongly disposed to advise my readers not to follow the plan of treatment he recommends without some special reason. I have never yet seen a case where I could adopt it with the prospect of its being beneficial; and the remedies seem to me so calculated in the majority of instances to do harm, that I am afraid of them. This opinion is given with the greater confidence because it is believed that from simpler remedies we may obtain all that can be desired.

One of the best agents with which I am acquainted for those troublesome cases of repeated miscarriage, occurring in weak and irritable women in whom there is an absence of vascular congestion and any specific disease, is assafœtida. This agent was first recommended by Dr. Laferla, of Malta;[2] who says that he thought of it while reflecting upon those instances where the fœtus having reached a certain period of development dies prior to birth, the mother in this way sometimes bringing forth a succession of dead infants. He was disposed to attribute the occurrence to debility or inertia of the uterus; and in searching for means to invigorate the condition of this organ without inducing its contractions he remembered Sydenham's commendations upon assafœtida in hysteria and especially in cases of debility of the womb. Whether these views are correct or not it is certain the medicine does great good, especially in nervous susceptible women who are so prone to abort. The dose which I usually administer is about five

[1] Zeitschrift für Geburtskunde. Band xxvi, pp. 339, 355. Berlin, 1849.
[2] Medico-Chirurgical Review. New Series, vol. vi, p. 266. London, 1847.

grains of the extract every night at bedtime, or each night and morning; and I generally take care that the patient shall have had from half an ounce to one ounce before arriving at that period of her pregnancy at which she has formerly aborted. When the drug gives rise to dyspepsia with cardialgia, as it sometimes will, its use should be completely suspended for a few days, unless a few doses of bismuth cures these symptoms. Beyond causing a little indigestion, however, I have never seen any injurious consequences from the prolonged use of assafœtida. On the contrary, my estimation of its value has much increased since first recommending it.

Where the previous interruptions to the pregnant condition have been due to the effect of the syphilitic poison, there is no remedy for stopping the further ravages of this disease to be compared with mercury. Iodide of potassium, chlorate of potash, nitric acid, assafœtida, &c., are in such instances worse than useless. Mr. Langston Parker believes that when a woman has been diseased previous to pregnancy, and at the time of conception has a well-marked constitutional syphilitic taint; or, if healthy at the time of conceiving, she contract a primary sore, and become constitutionally diseased early in her pregnancy; then, in either case, there may be a hope of cure, during gestation, with a prospect of preserving the child, if an appropriate treatment be adopted. But, if the woman have been perfectly healthy, previous to her conceiving, and the ovum be diseased by the semen of a tainted father, and the mother become subsequently affected through the medium of the fœtus in utero, there is little hope of cure till after delivery.

In administering mercury to pregnant women any one of the usual preparations may be had recourse to; but for many considerations I frequently give the preference to the perchloride. The chief reasons for this selection are the ease with which it can be taken, the almost certainty that it will not produce salivation, and the length of time for which it can be persevered with. When required by the system, none of the functions of the body are disturbed in any way by this preparation. Under its influence the patients regain a state of sound health to which they may have long been strangers; they increase considerably in weight; their secretions become perfectly natural; and they eat and digest and sleep well. Moreover, they lose that fearful mental depres-

sion which is such a frequent result of the contaminated state of the blood. A dose of the perchloride, varying from the sixteenth to the eighth of a grain, may be given twice or thrice daily, for two or three months; while it should be administered either in solution or in a pill, and with a small quantity of henbane or conium to prevent any irritation of the intestinal mucous membrane. Moreover, although the chemist may regard a mixture of the perchloride of mercury and bark as an unscientific compound, yet experience has taught me that it is very valuable in many cases where the influence of this metal is needed in an enfeebled or strumous subject. A favorite formula, is one fluid drachm (= gr. $\frac{1}{16}$) of the pharmacopœial solution of the perchloride, the same quantity of the compound tincture of bark, ten minims of the compound tincture of chloroform, and an ounce of peppermint water.—In cases where it is necessary to get the system quickly under the influence of mercury, the combination of inunction with the mercurial vapor bath, will more safely and easily effect this than any other proceeding. When a patient comes under treatment soon after a miscarriage and before again becoming pregnant, it is of course necessary that her husband should undergo a mercurial course as well as herself.—With regard to the use of iodide of potassium in these cases I can add but little to what has been already said. I have no faith in its doing any permanent good; and knowing its value in causing the menstrual flow in certain forms of simple amenorrhœa, I should be afraid of its directly producing abortion.

When the history or symptoms in any particular case seem to indicate that the previous fœtal deaths have been due to disease of the placenta, the treatment must—in the present state of our knowledge—partake somewhat of an experimental character. The fœtal type of respiration resembles that of fishes; for just as the blood of the fish is sent into the vessels of the gills to be purified by the oxygen in the surrounding water, so the blood of the fœtus is sent into the tufts or terminal branches of the fœtal portion of the placenta to be exposed to the oxygen contained in the maternal blood. Now Sir James Simpson has very ingeniously suggested that by the administration of certain agents we may render the maternal blood a more highly oxygenating medium than it is ordinarily; so that, when applied to the fœtal placental tufts, it may make up, by the quality or intensity of the

respiratory change which it there produces, for that loss of quantity which is a necessary consequence of a portion of these placental tufts being already destroyed by disease.[1] With this view the patients have been kept constantly on small doses of alkaline salts, such as chlorate of potash, nitrate of potash, bicarbonate of soda, &c., given several times a day on an empty stomach; just as Dr. Stevens proposed to accomplish the purification of the non-arterialized blood of fever and cholera patients. Sir James Simpson generally gives from ten to thirty grains of the chlorate of potash several times a day; but whether this preparation really does afford oxygen to the system or not may be considered a debatable question. It seems, however, certain that patients have frequently spoken of a perceptible influence on the strength of the movements of the fœtus being exercised by these salts. And clearly, if they act in the manner supposed on the maternal blood, the fœtus must, under their use, be placed in a better and purer atmosphere; while in this purer atmosphere—so to speak—it will be capable of living for a few weeks longer than it would otherwise. Acting on the same principle I have prescribed the peroxide of hydrogen, which has seemed to have had a favorable action, more especially when given simultaneously with mild chalybeates. Very possibly also, the latter may invigorate the child, and prevent those placental diseases—such as fatty degeneration—which are perhaps connected with want of power in the fœtal economy or circulation.

There is another plan of treatment which is applicable to these cases, as well as to those where fœtal life has been extinguished in successive pregnancies at about the same time from any cause. This is, the induction of premature labor at about the seventh or eighth calendar month. Probably every obstetric physician has met with instances in which this practice has been successfully adopted. The following case is a good example of its value:

In July, 1858, I delivered a lady of a stillborn female child at the full term of gestation. The placenta was affected extensively with fatty degeneration. The result of the labor caused great mental distress to the parents, as it was the third pregnancy which had ended in the same unfortunate manner; but it was not altogether unexpected by the mother, as no fœtal movements

[1] The Obstetric Memoirs and Contributions of James Y. Simpson, M. D., &c. Edited by Drs. Priestley and Storer. Vol. ii, p. 459. Edinburgh, 1856.

had been perceived for the fourteen previous days, and the lady had suffered from weakness and great depression of spirits. A careful investigation of the medical history of both the parents threw but little light on the case; for it could only be learnt that the mother had a hereditary tendency to phthisis. On the 24th December, the catamenia ceased, after having been on for five days; and a few weeks subsequently I was informed that my patient was pregnant. When it was found at a later period, that this statement was correct, permission was readily obtained to bring on premature labor when the eighth month was reached. Accordingly on the 1st September, 1859, I introduced a small sponge tent into the os uteri, and left it there. At the same time a common exhausting glass was frequently applied to each nipple. Uterine contractions supervened on the following day, which were kept up by the administration of full doses of ergot; until, after an easy labor, delivery of a delicate female infant was safely accomplished. The mother made a speedy recovery; and in January, 1860, the child was strong and healthy.

Great stress has been laid by most writers on the necessity for abstaining from the performance of surgical operations upon pregnant women. It has often been said that even the extraction of a tooth has caused abortion. Without denying that it is as well to be cautious under these circumstances, still I am sure that mischief may arise from an excess of care. The evils which result from constant pain and sleepless nights, or which arise from the employment of opiates to give temporary relief to suffering, can scarcely be exaggerated. The shock of an operation, moreover, is so greatly diminished by the use of chloroform, while both the preparatory and subsequent treatment of patients are so different to what they were a few years ago, that I am certain surgical proceedings may now be safely resorted to which could not formerly have been employed.

(2) *The treatment of Abortion when expulsion appears unavoidable.*—The measures to be adopted under these circumstances require to be selected with great caution; because unless the expulsion of the contents of the uterus seems to be quite inevitable, attempts should be made to prevent it. On the other hand, care must be taken to guard the patient from the dangerous consequences of retaining the ovum when it is blighted or detached from the uterus; for under such circumstances it can only be regarded as an irritating foreign body.

Let us suppose that the practitioner is called upon to treat a case of threatened abortion at the third or fourth month. Allow that there is hemorrhage, slight rigors, pains in the back and groins, and general depression; but that no complaint is made

of frequently-recurring, bearing-down, expulsive pains, like those of labor. His first duty will be to make a careful vaginal examination. Then if the os uteri be found firm and unyielding, or only slightly open, his efforts are to be directed towards controlling the hemorrhage and quieting the uterus. To accomplish this, the strictest tranquillity is to be enjoined. All cold applications to the hypogastrium—so often resorted to—are to be avoided; since they can only serve to drive the blood from the surface, and probably to induce uterine contractions. Acid drinks, lemonade, &c., may be freely given; while ice to suck, or common fruit water ices, will prove very grateful. With regard to drugs much care is necessary. If the uterine fibres appear irritable, and we therefore wish to prevent contraction, then a full dose of belladonna should be administered, giving it either by the mouth or, often preferably, by the rectum. The beneficial effects of this drug are usually very striking; and I have known it act efficiently even when the os uteri has become somewhat dilated by the action of moderate pains. Sometimes astringents do great good; no remedy of this class being more efficient than gallic acid in frequently-repeated doses of ten grains. In my hands, no drug has proved more useless than the often-vaunted acetate of lead, unless given in very much larger quantities than are usually prescribed. Supposing the os uteri, instead of being firm, is found soft and relaxed, belladonna will do harm. I have then found the compound tincture of cinnamon a valuable medicine. Two drachms should be given every two or three hours, until the bleeding ceases, or until a sense of nausea is experienced. Where the hemorrhage is rather abundant, the gallic acid may be advantageously prescribed in combination with the cinnamon; or the officinal glycerine and gallic acid will be found an elegant preparation. When the patient is weak and anæmic, the tissues soft, and the circulation languid, the ammonia iron-alum is preferable to the cinnamon and gallic acid; ten grains being administered in distilled water every four or six hours.[1]

[1] Dr. Burns speaks very highly of the effects of arsenic in the hemorrhage of threatened abortion, but as I have had no experience of the utility of this metal in such cases, it is not mentioned in the text. This gentleman says that he knows of no remedy so prompt in arresting not only the hemorrhage but the uterine contractions. He gives twenty drops of Fowler's solution at once, and then ten drops every ten minutes. This agent is stated to be equally valuable in menorrhagia, and in cases of prolonged or excessive lochial discharge.—American Journal of Medical Sciences. New Series, vol. xxxviii, p. 393. Philadelphia, 1859.

In cases where the hemorrhage is very profuse we may be sure that there is a considerable separation of the ovum from the uterus; while the chances of preserving the fœtus will be small. Nevertheless, we may try to prevent expulsion; and in such cases no single remedy is so valuable as opium. The difficulty with this drug is to give such a dose as will induce enough uterine contraction to close the orifices of the bleeding vessels, and no more. If the contractions go on beyond this point, the expulsion of the fœtus will occur. As a general rule it will be better not to commence with a larger dose than one grain.

When an abortion seems to be impending it sometimes happens, on making a small vaginal examination, that a mass can be felt protruding through the os uteri. Now it is not always a very easy matter to decide whether this is an ovum, or merely a coagulum of blood. Perhaps, the patient is not even pregnant; there being merely a clot of blood at the mouth of the womb, the consequence either of hemorrhage from a tumor or of a retention of the menses. The distinction between a clot and an ovum is on all grounds very important therefore. If in pregnancy we attempt to remove a clot when the ruptured vessels are plugged with it, we shall be directly doing that which it ought to be our object to prevent. Hence, to decide this point, the practitioner must keep his finger in contact with the substance lying in the os uteri, and wait for the accession of a pain; and then ascertain whether the presenting mass becomes tense, advances lower, and increases somewhat in size, as will happen when it is the ovum. "On the other hand, if it be a coagulum, which it is well known assumes a fibrous structure, it will neither become tense nor descend lower, but be rather compressed. Generally speaking, the ovum feels like a soft bladder, and at its lower end is rather round than pointed; whereas a plug of coagulum feels harder, more solid, and less compressible, and is more or less pointed at its lower end, becoming broader higher up, so that we generally find that the coagulum has taken a complete cast of the uterine cavity. If we try to move the uterus by pressing against this part, it will instantly yield to the pressure of the finger, if it be the ovum; whereas the extremity of a coagulum under these circumstances is so firmly fixed, that when pressed against by the finger the uterus will move also. When abortion happens at a later period of pregnancy, we shall be able

to feel the different parts of the child as the os uteri gradually dilates; viz., the feet, or perhaps the sharp edges of bones, although we cannot distinguish the form of the head, from the cranial bones being so compressed and strongly overlapping each other."[1]

Where the bleeding is so continuous as to endanger life, or when it occurs in combination with uterine contractions, and particularly with rupture of the membranes, then the expulsion of the product of conception is to be hastened. With this object the os uteri may be irritated and dilated by the introduction of the finger, while the ergot of rye should be given in sixty-grain doses every half hour. Where the symptoms are not urgent, it will often be advisable to trust at first to the natural efforts alone; the practitioner contenting himself with watching that no untoward circumstances arise. If the uterine contractions, however, are slight, a dose of ergot—with or without fifteen or twenty grains of borax—can do no harm; while by making the pains stronger, it may help to cause the detrusion of the ovum entire, a circumstance which is much to be desired. Not unfrequently the os uteri dilates so very slowly, that the expulsion is considerably delayed. Under such circumstances, if serious flooding be present, small pieces of ice should be passed into the vagina, or enemata of cold water can be repeatedly used; but these failing, the tampon or plug is the only resource. The best material with which I am acquainted for plugging the vagina is cotton-wool; small pellets of this substance being introduced one after the other, and pushed right up, and even into the os uteri, until the vagina is quite full. Dewees recommends the use of a sponge large enough to fill this canal, soaked in vinegar. The blood gets infiltrated into the pores of the sponge, and coagulating, forms a large clot; which not only seals up the vagina hermetically, but is borne without inconvenience for many hours. Whatever material be used, care must be taken to ascertain that the body of the uterus is not afterwards enlarging under the influence of internal hemorrhage; an occurrence which is not likely to take place, however, unless the pregnancy has advanced to the fifth month. When the plug is withdrawn at the end of twelve hours or so, the mouth of the womb is generally found

[1] Hohl On Obstetric Exploration. Quoted from Dr. Rigby's System of Midwifery, p. 93. London, 1844.

fully dilated, and the fœtus and membranes projecting through it; so that these structures can be readily removed by hooking the finger into them, or by seizing them with a pair of properly-made forceps.

In cases where the fœtus is expelled alone, and the placenta and membranes do not at once follow, it may be advisable to wait about an hour—provided there is no bleeding—to allow the uterus to throw them off spontaneously. If this practice fails, attempts must be made to remove the structures. The ergot of rye will often excite contractions, and cause the uterus to empty itself. Or two of the fingers may be introduced into the uterine cavity, and the mass taken hold of; or a pair of slender forceps, deeply grooved at the extremity, can be gently passed, and the substance seized and withdrawn. Galvanism may also occasionally be resorted to, in the place of these measures; the positive pole of the battery being applied to the upper part of the spine, and the negative to the cervix uteri through a glass tube. In every instance, stimulants should be freely administered if the woman be much exhausted; while she should not be left until the hemorrhage has been controlled, nor until the system has rallied.

Before concluding this chapter it ought to be noticed that the following train of symptoms sometimes occurs, and places the patient's life in great danger:

A woman aborts at about the third or fourth month, and the substance expelled is thrown away instead of being examined by the medical man. For the succeeding twelve or twenty days everything has progressed most satisfactorily, so that the usual habits of life have been resumed. But suddenly, possibly after a little more exertion than ordinary, a violent attack of flooding sets in, giving rise to great depression and alarm; and the practitioner is hastily summoned. He, finding no general symptoms to account for the hemorrhage, very properly makes a vaginal examination; but merely discovers that the os is small and contracted, the cervix only slightly or not at all developed, and the body of the uterus perhaps rather larger than common. Under the influence of rest, astringents, ergot, galvanism, the plug, or the unassisted efforts of nature, all bleeding ceases in the course of a day or two; but the cessation is of short duration, for the same symptoms return, and the patient becomes greatly prostrated. Again, and perhaps again this happens, unless a correct diagnosis be formed, and proper treatment adopted. The cause of the mischief in all probability is the retention of a small portion of the ovum, perhaps—as in the case of Mr. Humphreys already quoted—of a piece not larger than a shilling; and unless this is got away, the hemorrhage is very likely to return, and in the end to prove fatal.

The treatment I have successfully practised under such circumstances as those just described, and which I would therefore strongly recommend, is this: The mouth of the womb is to be dilated by the introduction of sea-tangle or sponge tents; a small one being first employed, which at the end of twenty-four hours is to be replaced by a larger one, and this by another, until the requisite amount of dilatation be obtained. By means of the finger passed into the uterine cavity, or by the aid of a pair of forceps, the piece of ovum is to be drawn away; a proceeding which can generally be accomplished provided the substance is not very rotten, or is not firmly adherent to the walls of the uterus. In the event of the latter being the case, the cavity must be explored by the finger to discover the seat of attachment; and then the substance is to be scraped away either by Recamier's curette or by Simpson's uterine gouge. In careful hands the adoption of this mode of treatment will be followed only by the best results. The bleeding will permanently cease; while ferruginous tonics, with a free animal diet, will ultimately restore the patient to perfect health. After an abortion of even a favorable character, as much caution and care will generally be required as after a labor at the full term. Strict rest in bed should be enjoined for a few days; a nourishing diet, with or without stimulants, is to be allowed; and opiates, cooling aperients, or astringent tonics are to be given, according to the indications present. Only a gradual return to the usual occupations is to be permitted; and it will be advisable to forbid sexual intercourse until a week or two after the general health has been completely re-established.

CHAPTER VI.

THE EXAMINATION OF SUBSTANCES EXPELLED FROM THE UTERUS, ETC.

1. AN EARLY OVUM—MODE OF EXAMINING IT—THE APPEARANCES OF THE DECIDUAL COVERINGS—DECIDUAL COTYLEDONS, AND THEIR OFFICE.—2. MOLES—THE NATURE OF THESE SUBSTANCES.—3. THE VESICULAR MOLE—ITS ORIGIN IN CYSTIC DISEASE OF THE CHORION—GENERAL CHARACTERS OF THE DISEASE.—MAY TRUE HYDATID CYSTS BE FORMED IN UTERO?—4. THE MENSTRUAL DECIDUA—ITS IDENTITY WITH THE TRUE DECIDUAL COVERING OF THE OVUM.—5. MEMBRANOUS FORMATIONS FROM THE VAGINA—EXFOLIATION OF THE VAGINAL EPITHELIUM.

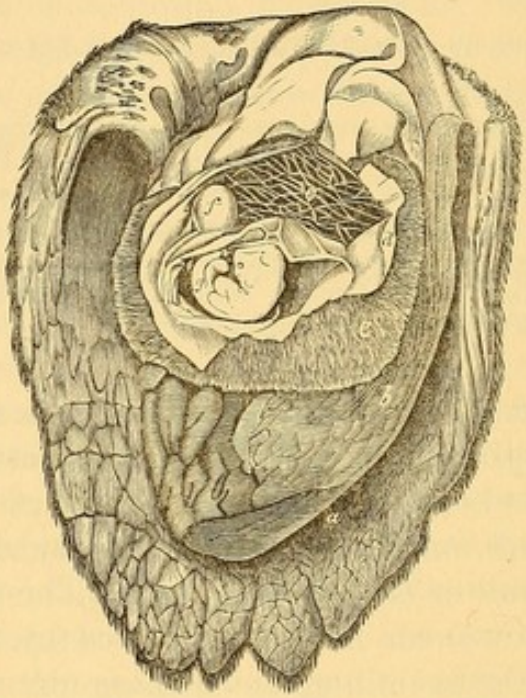
THE practitioner of obstetric medicine is not unfrequently called upon to give an opinion as to the nature of some substance which has been expelled from the uterus or vagina; and especially perhaps may he be required to say whether such substance is the result or not of conception. The fair fame of more than one chaste woman has been blotted by the ignorance or carelessness of the examiner, under these circumstances; but it is to be hoped that the days when such errors were made have permanently passed away.

The substances which may be expelled from the female organs of generation, and the structure of which may be disputed, are these: (1) An early ovum; (2) A mole; (3) A vesicular mole; (4) The menstrual decidua; and (5) Membranous formations from the vagina. These will now be considered *seriatim*.

1. AN EARLY OVUM.—Within the first month, the ovum, is generally so broken up during its expulsion, that its texture can hardly be recognized. This is not the case after the fourth or fifth week, when the structure usually remains sufficiently distinct to allow of its nature being made out by a careful scrutiny. To examine the mass properly, it should be soaked in water for a day or two, so as to remove the coagulated blood with which it is infiltrated. The component parts are then to be cautiously and slowly separated under water. It frequently happens, that although we fail to find the embryo, yet we may be able to

recognize the ovum sufficiently to assert that it is the product of conception. Should an embryo or a portion of one be discovered, however, the nature of the substance is of course decided.

FIG. 10.



AN ABORTED OVUM IN THE SECOND MONTH. (After Wagner.)

A fragment of the decidua vera, *a*; decidua reflexa, *b*; albumen, *c*, lying between the chorion, *e*, and the amnion, *d*; the embryo, *g*, floating in liquor amnii; umbilical vesicle, *f*, connected with the intestine of the embryo by a slender prolongation—the vitelline or umbilical duct.

In an early abortion, the whole lining of the uterus, together with the decidua reflexa or ovuli, is frequently thrown off entire; constituting a somewhat triangular-shaped cast of the uterine cavity. The outer surface of the mass consists of a soft and red and uneven or shaggy pulpy membrane—the uterine decidua; the internal surface of which is smooth, generally thrown into slight folds, and studded with very minute depressions, which are scarcely perceptible to the naked eye. These characters are perhaps scarcely sufficiently distinctive to enable us to speak positively as to the nature of the substance. But there is another remarkable feature in the organization of this peculiar product, which was first pointed out by Dr. Montgomery, and which he thus describes: "Repeated examinations have shown me that there are, on the external surface of the decidua vera, a great

number of small cup-like elevations, having the appearance of little bags, the bottoms of which are attached to, or embedded in its substance; they then expand, or belly out a little, and again grow smaller towards their outer or uterine end, which, in by far the greater number of them, is an open mouth when separated from the uterus; how it may be while they are adherent I cannot say. Some of them, which I have found more deeply embedded in the decidua, were completely closed sacs. Their form is circular, or very nearly so; they vary in diameter from a twelfth to a sixth of an inch, and project, about the twelfth of an inch, from the surface of the decidua. Altogether, they give one the idea of miniature representations of the suckers of the cuttle-fish."[1] This author regards these "decidual cotyledons"—or "Montgomery's Cups," as they are now often termed—as reservoirs for nutrient fluids separated from the maternal blood, to be thence absorbed for the support and development of the ovum. The fact, that during the early periods of gestation the ovum derives its nourishment by imbibition through the connection existing between the decidua and the villi on the outer surface of the chorion, renders the correctness of this opinion highly probable. Moreover, as the decidua is now known to consist of the hypertrophied mucous membrane of the uterus, so it is almost certain that these cups are identical with those utricular glands or follicles which are found as a system of tortuous canals ramifying through this membrane in the unimpregnated state.

Internal to the uterine decidua is the ovular or chorial decidua, the outer surface of which is nearly smooth, while the inner is marked by irregular depressions or shallow pits leading to tortuous canals. These lacunæ have been occupied by the arborescent villi which shoot from the surface of the chorion, and which thus form the bond of union between the fœtal and the maternal membranes. These villi are never found but on the chorion or uterine surface of the placenta; and hence their discovery is a sufficient proof of the nature of the substance under examination.

In abortions occurring during the first six or seven weeks, it not unfrequently happens that the ovular decidua with the embryo and remainder of the secundines is thrown off separately from the uterine decidua, this membrane becoming detached

[1] The Signs and Symptoms of Pregnancy. Second edition, p. 253. London, 1856.

subsequently. Sometimes, also, the embryo comes away alone at first, and is followed by the secundines; although this rarely happens until the formation of the placenta is further advanced than it is by the end of the second month.

It is important to remember that an embryo may die, and either remain as a little lifeless mass, or become broken up and lost, and yet that its membranes may not be expelled for weeks or months afterwards. Thus, a woman becomes pregnant just before her husband leaves for a voyage of eight or nine months' duration. On his return, an ovum of the second or third month happens to be expelled. Now unless we can explain this circumstance, the woman may have the most unjust suspicions cast upon her reputation. At one of the meetings of the Pathological Society, Mr. Thomas Ballard exhibited a specimen for the purpose of proving the truth of this observation.[1] The preparation consisted of a portion of ovum, resembling a small placenta, from which the cord and thinner portions of membrane had disappeared; and it was expelled on the 4th March, 1857, after a modified labor of six hours' duration, attended with a good deal of hemorrhage. The evidence adduced of its having been retained until the full period of gestation was as follows: In October, 1856, the patient engaged Mr. Ballard to attend her in her expected confinement in the following March; she being then four months advanced in pregnancy. The catamenia had not appeared since the middle of June. The usual signs of pregnancy existed until the 18th October. Then she had a discharge of blood, which continued until Christmas, though only very slightly after the first two days. She had also during this time constant pain in the back, while she no longer increased in size; but she was not conscious of a solid substance having passed from her at any time. The pain and slight hemorrhage entirely ceased at Christmas. After this date she had a continued discharge of watery fluid and whites, but no return of pain until the specimen exhibited was expelled at the beginning of March.

A separated ovum presenting at the partially-dilated os uteri has been mistaken for a polypus; or, conversely, a polypus may be regarded as a dead ovum. In either case, the mistake is generally due to the abundant hemorrhage which the foreign

[1] Transactions of the Pathological Society of London, vol. viii, p. 281. London, 1857.

body gives rise to. But if any doubt be felt by the practitioner, an examination with the speculum will remove the uncertainty. For as regards a polypus, the projecting part is seen to be of a bright red color, with blood exuding from it. This is a condition never witnessed with an ovum. To the touch also, there is a feeling of greater firmness communicated by a polypoid tumor than by the membranes of the embryo, even though the latter are infiltrated with coagulated blood. In either case, an erroneous diagnosis is not of much consequence. For whatever the nature of the body may be, it must be removed; the risk of flooding being considerable until extraction is accomplished. On drawing down the polypus, of course the pedicle will be seen or felt, and this will have to be divided. In taking away the ovum, the chief point requiring attention is to bring away the whole of the mass.

2. Moles.—Much difference of opinion has existed among authors as to the nature of those substances which are commonly described under the term of moles. This confusion has chiefly arisen from very various substances having been indiscriminately classed together under this epithet; such as polypi, dysmenorrhœal membranes, condensed coagula of blood, decayed ova, &c.

My own opinion is that there are but four kinds of moles, properly so called; and that they are all the result of conception. Thus, we may have presented to us the deciduæ with both its layers and cavity infiltrated with blood; or, a placenta which has continued its growth after the death of the fœtus; or, the degenerated remains of the placenta; or, the hydatidiform or vesicular mole.

The *first* substance may have its origin in this wise: During the earliest weeks of pregnancy, from a sudden shock or other cause, blood is effused into the decidual cavity, filling it with a clot, and generally obliterating all trace of the embryo. If the substance be quickly expelled, it will exhibit the triangular shape presented by the uterus at the commencement of gestation; but if retained, firm layers of fibrine often become formed upon its external surface, and it will perhaps increase to the size of an orange or even get larger. Supposing no blood is poured into the decidual cavity, either the entire embryo may be found, or only a portion of it; while the deciduæ with the coagulated fibrine

form a pale yellowish and fleshy envelope, varying from the eighth of an inch to one inch in thickness.

The *second* species of mole arises, when the fœtal germ, dying soon after conception, becomes atrophied or absorbed; although the placenta and membranes continue to grow. These tissues derive their nourishment from the inner surface of the uterus; and they become transformed by progressive development into an indistinctly fleshy and vascular mass. This may be retained in the uterus for several months; giving rise during the whole time to many of the symptoms of normal pregnancy, together generally with repeated attacks of flooding. Sometimes the hemorrhage is almost constant; in many cases it comes on irregularly after undue excitement; while in others it is periodical, and simulates an attack of ordinary menorrhagia.

The *third* and most uncommon form of mole consists merely of the placenta or a portion of it; which, having been imperfectly nourished on the uterine surface, has become almost an amorphous mass. Usually, entire groups of the villi are found, on a microscopic examination, to have been altered; the most frequent metamorphosis consisting of an infiltration of a grayish-brown molecular substance, which destroys their transparency and renders them more or less opaque. In the early stages of this disease, the opacity is confined to the clavate extremities of the villi; but as the accumulation increases, the whole of each villus gets infiltrated. As the villi further degenerate, their diameter becomes lessened; and groups of them collapse. The tissues of the stems of the villi are also frequently seen to be in a state of fatty degeneration; and this change may sometimes be found affecting the arteries of the umbilical cord at their insertion into the placenta. The affected portions of the placenta are generally observed to be quite bloodless. If this degeneration of the villi occur at an early period, the embryo will not be found; as it has probably been partly or completely dissolved. The remains of the umbilical cord, enlarged and pulpy, may sometimes be made out; the free extremity being ragged or shreddy.

Organized bodies, somewhat resembling to the naked eye these masses of degenerated placenta, are now and then discharged from the uterus. They are usually pale-colored and soft and oval-shaped substances of variable size; they are frequently mixed with coagula; no chorion villus can be discovered in any portion

of their structure, but merely connective tissue with cells of various kinds; and there is no vestige of a cavity for the reception of the embryo. It is probable that these substances merely consist of a new formation of connective tissue; this having been produced on the uterine wall quite independently of impregnation. As a rule, such structures are thrown off and expelled by the hemorrhage to which they give rise. After they have come away, the os uteri may remain open and patulous and perhaps slightly torn for some days; there may be a thin colored discharge, from a slight oozing of blood resembling the lochia; and the breasts will possibly be found enlarged and tender. The areola round the nipples, however, is seldom as dark as it is in pregnancy; while the breasts do not contain milk. Nevertheless, under these circumstances, an erroneous opinion might be formed that the patient had been pregnant and aborted. To prevent any mistake, the substance which has been expelled should be carefully examined.

The *fourth* species of mole is of more importance than the other varieties; and hence may advantageously be treated of in a section by itself:

3. The Vesicular Mole.—The chorion is subject to certain morbid alterations which are deserving of attention. The most remarkable of these is the transformation of its villi into vesicles or cysts, which are intimately united together by little pedicles. The product thus arising from this cystic disease of the chorion is known as the vesicular or hydatidiform mole; the cysts being likewise spoken of by some authors as "uterine hydatids." It seems to me, however, very desirable to abolish altogether this latter designation; inasmuch as it conveys and perpetuates an erroneous impression as to the nature of these bodies. Cruveilhier first demonstrated their non-hydatid nature; and all succeeding observers who have carefully examined their structure have confirmed the statements of this distinguished author.

The general characters of this disease can be studied in any pathological museum, and hence they are generally well known. A portion, or perhaps the whole, of the chorion is found covered with pellucid vesicles containing a limpid serous fluid; each vesicle having long and slender and often branching pedicles. The sacs are oval or pyriform-shaped; their walls are clear, or marked

with opaque dots; and they may be simple, or may present other cysts projecting from their tissues. Two questions will arise in the mind of the physician who examines a vesicular mole. First,—What is the nature of the change in the chorion villi which results in the production of these vesicles? And second,—What causes the change?—With regard to the first question, Mettenheimer insists that these bodies are cysts; and Paget adopts the same view. The mode in which their formation probably takes place is thus described by these pathologists: Certain of the cells in the proper villi of the chorion, deviating from their cell-form, and increasing disproportionally in size, form cysts, which remain connected by the gradually elongated and hypertrophied tissue of the villi. On the outer surface of the new-formed cysts, each of which would, as it were, repeat the chorion, and surpass its powers, a new vegetation of villi sprouts out, of the same structure as the proper villi of the chorion. In these begins again a similar development of cysts; and so on *ad infinitum*. Each cyst, as it enlarges, seems to lead to the wasting of the cells around it; and then, moving away from the villus in which it was formed, it draws out the base of the villus, which strengthens itself, and forms the pedicle on which the cyst remains suspended.[1]—Now Gierse, and subsequently Dr. Graily Hewitt, have dissented from these opinions. In a specimen which the latter gentleman had the opportunity of submitting to microscopic examination, he found the vesicular bodies to possess the same structure as that of normal chorion villi; but the cells on the surface were wider apart, and the villi were distended by a serous fluid, giving rise to the enlargements. From this it would appear that in the healthy villi and in the altered ones we have precisely the same structures; and hence it cannot be necessary to have recourse to a cyst theory to account for the appearances. If these observations be correct it necessarily follows that in the vesicular mole we have not a new formation, but simply an alteration and degeneration of existing structures.[2]

The second question to be considered is,—What are the circumstances which induce this pathological change? On this

[1] Lectures on Surgical Pathology, delivered at the Royal College of Surgeons of England. By James Paget, F.R.S. Revised and edited by William Turner, M.B., &c. p. 421. London, 1863.

[2] Transactions of the Obstetrical Society of London. Vol. i, p. 249. London, 1860.

point Dr. Graily Hewitt differs materially from other observers. It has been universally supposed that the transformation in the villi of the chorion was the starting-point of the affection: in other words, that the disease of the chorion was the cause, the death of the embryo the effect. On the contrary, this gentleman contends that the death of the embryo occurs first, and the chorionic transformation subsequently. He argues, as just noticed, that the hydatidiform mole results from a degeneration of structures arrested in their development. Death of the embryo involves arrest of chorionic development, but not necessarily cessation of vitality in the chorion villi; for these may continue to grow provided the decidua be not separated from the uterus, and this peculiar growth will then result in the formation of the vesicular mole.—After attaining a certain degree of development, the chorion villi do not appear to be capable of undergoing the change in question. The conditions necessary for that change are not present; and if the fœtus dies, no hydatidiform mole can be produced. The middle or end of the third month is probably the limit within which the alteration can originate. In most of these cases no trace of the embryo is to be found; or if found, it is very small, and very strikingly disproportionate to the bulk of the mole. The evidence on this point shows, then, that the embryo perishes at so early a period as often to leave no traces behind it; or, in other words, that it does not survive a period, which may be roughly fixed as the end of the second month.

The question has sometimes been raised as to whether a portion of the fully developed placenta left in the uterus—that portion extracted at the time of labor being free from cystic degeneration—can subsequently become the seat of hydatidiform disease? Thus, a pregnant woman loses her husband: at the time of labor part of the placenta is retained: this portion may undergo—let us for a moment suppose—cystic degeneration and become enlarged, so that when expelled some weeks or months afterwards it will give rise to most injurious suspicions against the widow's virtue. Now, can this really happen? In the present state of our knowledge it must only be replied that such an occurrence is in the highest degree improbable; but there are two conditions which forbid my saying that it is impossible. One possible occurrence is, that a small portion of the chorion villi may have become accidentally separated from the embryo at an early period,

and have been then altered; while the remainder has grown normally. The other condition which should be admitted arises in cases of twin gestation, when one ovum perishes at an early date and the chorion villi degenerate. The diseased mass may then be retained after the expulsion of the healthy fœtus at the normal termination of gestation; or it may be expelled some weeks previously without interfering with the other embryo and placenta. This latter occurrence seems to have taken place in the case of the celebrated anatomist Béclard; whose mother when she was about four months advanced in pregnancy with him, expelled a large vesicular mole.

The vesicles when expelled vary in size from a pin's head to a large grape, being connected with each other in bunches by very fine pedicles. They generally also exist in great numbers, so as to form large flocculent vesicular masses the size of the adult head; while when expelled they are tinged with blood, so that if placed in water they will often be found to resemble—to use the graphic words of Dr. Gooch—"myriads of little white currants floating in red currant juice." The symptoms which indicate their presence in the uterus are not sufficiently distinct or constant to be entitled to much confidence; for they merely consist of some of the early signs of pregnancy,—such as suppression of the catamenia, a mammary areola of about the second or third month, perhaps morning sickness, with enlargement of the abdomen and uterus. The most characteristic symptom, however, is the frequent occurrence of irregular uterine discharges—sometimes of blood, oftentimes of water. In many cases it has been also noticed that the uterus is disproportionately large for the supposed period of pregnancy; while it gives the impression of being less firm than in healthy gestation. Sometimes, a loud uterine souffle may be heard. It need scarcely be said that there is an absence of fœtal movements, and that no fœtal heart-beat can be detected; although it is not uncommon for the patient to assert that she can distinctly feel a child. Occasionally, the pregnancy goes on to the time when it should naturally end,—that is to say for nine months from the day of fecundation; at which period labor pains set in, accompanied with hemorrhage. Unless the practitioner recognizes the nature of the case in good time, and empties the uterus by the introduction of his hand, the flooding may prove fatal before

the womb throws off its morbid contents spontaneously. When the mass has been entirely removed or expelled, the uterus contracts as after a natural labor. Milk will even be abundantly secreted by the breasts for a few days; and there may follow a kind of lochial discharge. A practitioner, called in for the first time two or three days after such a delivery, might imagine that an infant had been born and made away with; while the patient, if she had received no medical attendance, and had thrown away the vesicular mole, would be placed in an awkward predicament. Her description of the mass would have to be trusted to, more conclusive evidence being unobtainable. And the physician, remembering the foregoing facts, would at least be wise to give her the benefit of any doubt he might feel.[1]

In conclusion a few words may be said upon the question as to whether true hydatids can be discharged from the uterus. It seems to me that the bare possibility of this occurrence is not to be denied. Just as hydatid tumors may form in the liver, spleen, omentum, muscular structure of the heart, and bones, &c.; so there is no reason why they should not arise in the walls of the uterus, and acephalocysts be discharged by the vagina owing to the rupture of the tumor into the uterine cavity. So rare, however, is this occurrence, that I only know of one recorded instance of it. Rokitansky, speaking of this disease, states—"Cysts are very rarely formed in the uterus; we have not met with a single example in Vienna, and I myself have only inspected one case of uterine acephalocysts."[2] Should another such instance occur in the practice of any one of my readers, he will find no difficulty in deciding upon the true nature of these parasitic bodies.[3]

[1] The remarks in the text of course show that I believe these vesicular moles to be undoubtedly due to a prior act of fecundation. The only recent author of any note who decidedly maintains the opposite opinion is Dr. Bedford. This gentleman, arguing from the often fallacious guide of analogy, says: "There is much discrepancy of opinion as to the cause of these hydatid growths. The weight of testimony appears to refer their origin to conception, many authors of high name contending that the presence of these growths is undoubted evidence of previous pregnancy. That a diseased ovum may form the nucleus of hydatid development *in utero*, cannot be denied. But, on the other hand, we believe that they may exist independently of conception, in the same way that polypi, fibrous tumors, and various other substances, sarcomatous and osseous, are occasionally found in the virgin womb." Clinical Lectures on the Diseases of Women and Children. By G. S. Bedford, M.D. Fourth edition, p. 43. New York, 1856.

[2] A Manual of Pathological Anatomy. By Carl Rokitansky, M.D., &c. Sydenham Society's Edition. Vol. ii, p 291. London, 1849.

[3] See the author's Practice of Medicine, Fifth Edition, p. 547, for an account of the hydatid tumor and its structure, &c.

4. The Menstrual Decidua.—When we examine, with a quarter-inch object-glass, the normal catamenial fluid, it will generally be seen to contain a considerable quantity of epithelial débris; showing thereby that the healthy mucous membrane lining the uterus has a periodical tendency to shed its superficial cells. The uterine mucous membrane becomes congested and swollen, I believe, in most women at each monthly period. But in some forms of dysmenorrhœa it gets more hypertrophied; and then being exfoliated, is expelled with distressing bearing-down pains in the menstrual discharge. This dysmenorrhœal membrane is generally passed in fragments; but every now and then it comes away whole, forming a complete triangular-shaped cast of the entire uterine cavity. It is rough externally, having a cribriform appearance, produced by the pores of the utricular follicles or glands; whilst internally it is smooth and moist. The menstrual decidua is in structure identical with the true decidual covering of the ovum; but it may generally be distinguished from it by the circumstance that it is more flimsy and unsubstantial in character, that it is chiefly made up of layers of flattened or cylindrical epithelium, and that its gland ducts are very much smaller.

Occasionally small fibrinous substances, somewhat resembling almonds in shape and size, are expelled from the cavity of the uterus. These consist either of condensed coagula of blood, or of a layer of coagulable lymph partially organized, or of dysmenorrhœal membranes around which blood has been effused. On making a section of one of these latter masses, it will be found to consist of an external coat of coagulated blood lined by the membrane, the smooth surface of which is laid open by the incision. Mad. Boivin has related a case where a tumor of this kind was expelled, and where it was turned inside out; so that the smooth surface of the membrane formed its external covering. She supposes this happened by the upper portion of the membrane having been first detached from the uterus by blood insinuating itself between the two surfaces, and forcing the adventitious sac inwards and downwards, until at length it was completely inverted, and of course its surfaces reversed.[1] These substances are doubtless often due to some peculiar inflammatory

[1] Traité Pratique des Maladies de l'Utérus, et de ses annexes. Par Mad. Boivin et A. Dugès. Tome ii, p. 419. Paris, 1833.

action in the uterus producing false membranes, similar to those morbid products occasionally found on hollow viscera lined with mucous membrane. They are all formed quite independently of sexual intercourse.

5. Membranous Formations from the Vagina.—Exfoliation of the vaginal epithelium occurs in certain abnormal states of the system, especially when astringent injections are being used; the epithelium mixed with mucus coming away in flakes, or being passed in masses which form more or less perfect casts of the flattened vaginal canal. These pseudo-membranous and parchment-like patches are seen by the microscope to be composed of squamous epithelium; they are generally found to be sufficiently strong and firm to bear free handling. Many museum preparations labelled "False Membranes from the Uterus," very possibly consist in reality of these vaginal substances.

A very remarkable feature in the case of an unmarried lady suffering from hysterical neuralgia, which simulated all sorts of diseases, was the almost daily formation and expulsion, with considerable pain, of these membranous casts of the vagina. Dr. Montgomery, under whose care the lady was placed, says that they were quite transparent, of a light straw color like gold-beater's leaf, about two and a half inches long, hollow, the cavity about an inch in diameter, and closed at one end but open at the other. The patient had preserved three dozen bottles full. It is remarked that they might easily have been mistaken for a portion of the transparent membranes of the ovum.

The amount of suffering induced by the temporary loss of the vaginal epithelium varies very much in different cases. Sometimes the smarting is acute, so that a tactile examination cannot be borne; but generally the epithelial coat is reproduced very quickly, and then there is merely some slight itching and irritation. One patient complained of great uneasiness in sitting down, and of a peculiar crawling sensation in the vagina; while another, under my own care, compared her pains to those felt from a slight burn. Occasionally, there is evidence of the existence of chronic inflammation—subacute vaginitis. Very often, however, the local symptoms are inconsiderable; the practitioner's attention being only directed to them when the patient presents one of the membranous formations for examination.

CHAPTER VII.

EXTRA-UTERINE GESTATION.

1. Introduction: Changes which occur in the uterus in misplaced gestation—A decidua formed—The ovum has its proper membranes, the chorion and amnion—The growth and death of the fœtus.—2. Varieties—The tubo-ovarian, tubal, and interstitial or tubo-uterine.—3. Symptoms—the catamenia usually suspended—Mammary changes and morning sickness—Enlargement of abdomen not symmetrical—Severe pains in pelvis—A characteristic cry—Signs detected by a vaginal examination—The phenomena which follow rupture of the cyst.—4. Treatment—The precautions needed to prevent or retard rupture of the cyst—The measures which offer a chance of moderating the hemorrhage after laceration—The steps to be pursued after the extinction of fœtal life.

1. Introduction.—The normal place of abode for the embryo during gestation, it need scarcely be said, is the cavity of the uterus. From some cause or other, however, it occasionally happens that the impregnated ovum does not reach this part; and we then have, as a consequence, a form of extra-uterine pregnancy.

Various kinds of misplaced gestation undoubtedly occur among the lower animals, though it has been asserted by at least one physiologist, that this accident is peculiar to woman. Probably the earliest recorded instance is that by Felix Platerus; who describes the case of a cow, which, in 1597, conceived again during the retention of an extra-uterine calf.[1] So, also, it has long since been shown that this abnormal from of pregnancy may occur in the bitch and in the sheep;[2] while Haller describes a pregnancy of this kind in the hare.[3] In the bird it not unfrequently happens that the yolk or ovulum after escaping from its ruptured capsule in the ovary, instead of passing down the oviduct escapes into the peritoneal cavity; where it either becomes absorbed, or it will be retained without fœtal development taking place, or it

[1] Observationum in Hominis Affectibus plerisque, Corpori et Animo Functionum Læsione, Dolore, &c., p. 230. Basileæ, 1641.

[2] The Philosophical Transactions Abridged, &c. Vol. v, p. 531. London, 1709.

[3] Disputationes ad Morborum Historiam et Curationem Facientes. Tomus iv, p. 795. Lausannæ, 1758.

may almost immediately cause the death of the hen. In these cases the oviduct still secretes the albumen and membrane and shell; which are expelled without having any yolk in their interior.

Doubtful examples of misplaced pregnancy in the human female have been put on record, though not minutely described, many centuries since; but probably the first unmistakable case of the kind is that related by Felix Platerus. This author—in the volume already quoted from—reports that a concubine at the end of her third pregnancy, in the year 1583, had labor pains for eight days. These then subsided, without delivery taking place; but some time afterwards a small tumor formed just above the umbilicus, from which—on an incision being made—a semi-putrid fœtus was extracted. The patient recovered, and survived the operation one year. M. Cordæus, who was a contemporary of Platerus, Gregory Horstius of the seventeenth century, James Primerose, who practised at Hull, and whose remarkable work, *De Mulierum morbis et symptomatis*, was published in 1655, G. F. Hildanus at the commencement of the seventeenth century, the younger Riolanus about 1649, the Abbé de la Roque about 1682, J. D. Santorinus in the eighteenth century, William Smellie, and a host of writers since this time, have all reported instructive and well-authenticated cases.

When this irregular form of gestation occurs, the same changes take place in the uterus as happen in the early stages of healthy pregnancy. The entire organ becomes enlarged and congested, its texture is rendered soft and spongy, the arteries and veins increase in size, and the mucous membrane gets hypertrophied so as to form a true decidua. This decidua after a time loses its vascularity and gradually degenerates and breaks up; for having no office to perform, it follows the law which regulates the decay of all functionless organs. Dr. Robert Lee considers that the deciduous membrane is not always, if ever, formed in the uterus in extra-uterine conception; but that it sometimes surrounds the chorion. Almost all observers agree, however, that Dr. Lee is in error; it being the general opinion, that if in any particular instance the decidua be not found, it is only because it has been expelled by uterine contractions with the coagula and hemorrhagic discharges, either soon after, or just prior to, the death of the fœtus. Whether a decidua is also formed around the ovum

in its abnormal position is uncertain; Schrœder van der Kolk asserting that such is the case, while Virchow denies it. A review of the few trustworthy facts bearing on this point, which have been recorded, leads me to believe that the sac containing the ovum is not lined by a decidua. A delicate tissue, it is true, can sometimes be found; but this has only the structure of plastic lymph or fibrine, all the elements of a decidual membrane being absent. It is, however, certain, that in these fœtations the ovum has its own proper membranes—the outer chorion and the inner amnion; while most frequently an adventitious cyst is developed around the whole substance, the growth and expansion of which cyst only ceases with the termination of the fœtal life.

The walls of the cyst may vary in thickness from one to several lines; and usually they contract adhesions with all the surrounding viscera. The bloodvessels of the sac are often large, especially at that part to which the generally thin but expanded placenta is attached. Although it would at first sight seem impossible for the fœtus to live and grow in these misplaced gestations, yet the development of its organs appears to progress at the ordinary ratio, and to be subject to the same general laws as in normal pregnancy. "In ninety-eight cases," says Dr. Campbell, speaking of the tubo-ovarian variety, "in which we can decide, or nearly so, on the stage of pregnancy, the fœtus in *seventy-nine* patients died at the close of nine months, or soon thereafter; *one*, in the eighth; *seven*, about the seventh; *one*, in the sixth; *two*, in the fifth; *two*, in the fourth; *five*, in the third; and *one*, at the end of the first month."[1] When the misplaced fœtus dies, it generally undergoes decomposition. This change may either happen soon after its death, or, on the other hand, not for some years; during which time, surrounded by the cyst, it may be the cause of so little inconvenience, that the parent will perhaps again become pregnant, and bear a live child. Where putrefaction occurs, the decomposed structures give rise to inflammation in the surrounding tissues; suppuration takes place; and the fœtal bones and tissues often become removed through artificial openings in the abdominal walls, rectum, vagina, or urinary bladder. Besides this mode of termination, which greatly endangers the mother's

[1] A Memoir on Extra-Uterine Gestation, p. 110. Edinburgh, 1840.

life, there is another that is much more favorable. The soft parts of the fœtus and its involucra become in part absorbed, and in part changed into a fatty substance (lipopædion); or the entire fœtal body becomes converted into a calcareous mass (lithopædion); or it is largely altered into cartilage or bone (osteopædion). In either case, the mass will frequently be retained for many years without the woman's health being apparently injured. A third termination to an extra-uterine conception is the spontaneous rupture of the fœtal cyst, or of the dilated utero-ovarian veins, or of the Fallopian tube, or of the vessels in the walls of the cyst, at a somewhat early period of pregnancy; and the rapid death of the mother from the large quantity of blood which is in consequence effused into the peritoneal cavity.

If we inquire into the causes of these singular fœtations, our information appears sadly at fault. The most frequently admitted explanation is said to be found in the existence of a morbid condition of the Fallopian tube; such as undue narrowness, spasmodic contraction, excess or defect of length, paralysis, inflammation and engorgement, or induration of the fimbriated extremity. Possibly, also, the existence of any disproportion between the ovule and the area of the tube will serve to prevent the passage of the former into the uterus. Some writers have imagined that mental agitation from fright during coition might exert an influence in producing extra-uterine gestation; and three or four striking instances are recorded in favor of the correctness of this—at first sight—highly improbable view.

A remarkable circumstance connected with this subject has been especially noticed by Dr. Oldham and Dr. Arthur Farre; viz., that in a large number of cases of tubal gestation the corpus luteum corresponding with the ovum impregnated has been found in the ovary of the opposite side to that of the tube in which the ovum is developed. Thus, suppose the left Fallopian tube to contain the ovum, the right ovary may show the corpus luteum of a corresponding date; or *vice versâ*. The probable explanation of this curious phenomenon seems to be,—that at the time of the ovule quitting the ovary, the gland is embraced by the fimbriated extremity of the tube of the opposite side. This tube conveys away the ovule, and the latter then becomes fecundated in its cavity; but being delayed by the angle formed by the bending of the oviduct, the progress of the ovum is obstructed until

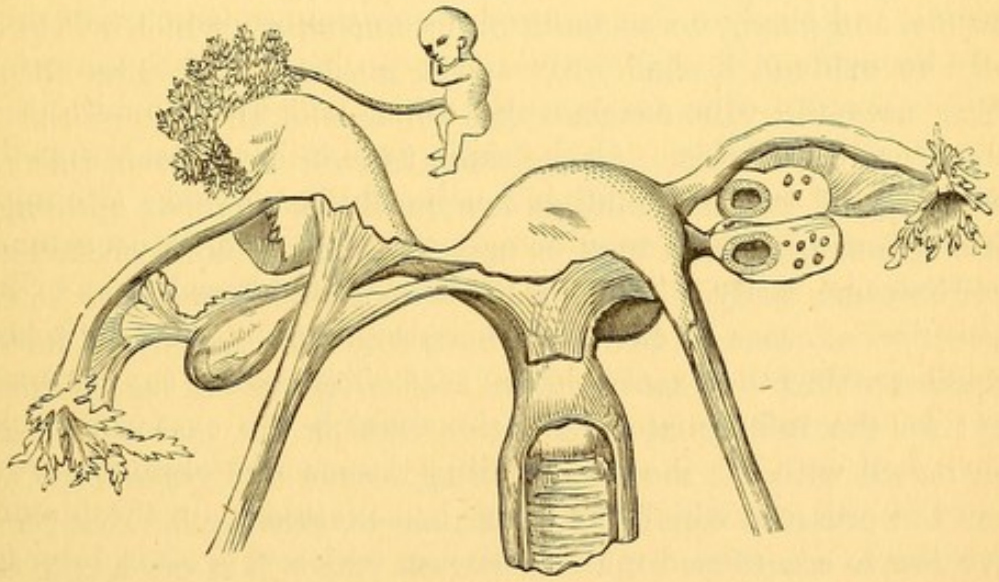
it has attained too great a size to permit of its entering the uterine cavity. In confirmation of this view, Dr. Farre mentions that there is a preparation in the Anatomical Museum of the University of Cambridge, in which both the Fallopian tubes are seen to be grasping the same ovary; their extremities being fixed to this gland by morbid adhesions. Dr. Tyler Smith gives a different explanation of the matter; for he supposes that the ovum after descending one Fallopian tube traverses the upper part of the uterine cavity, and then ascends the opposite oviduct by an antiperistaltic action, or by the ciliary currents which move from below upwards. In thinking over these cases it seems to me probable, that the hypotheses of both these gentlemen are correct: that is to say, that sometimes the opposite tube conveys away the ovum, and sometimes the latter performs a long journey from the ovary of one side, across the uterus, into the passages belonging to the other side. My reasons are these: The preparation in the Cambridge Museum seems undoubtedly to prove the possibility of Dr. Farre's explanation. An example of pregnancy in a rudimentary horn of the uterus recorded by Professor Scanzoni,[1] equally satisfies me as to the justness of Dr. Tyler Smith's opinion. In this case a fœtus was partly developed in a rudimentary horn seated on the left side of the uterus. The horn ruptured, and the woman quickly sank from the resulting hemorrhage: at the necropsy the corpus luteum was found in the right ovary. Now it is clear that if the left Fallopian tube had stretched over to the right side to grasp the ovary, its bend must have formed such an angle that the ovum would have been obstructed in the tube itself, and could not have reached the uterus. Hence it can only be allowed that in all probability the ovum passed through this latter organ. Bischoff also notices that he examined the body of a bitch, whose right ovary had one while the left had five corpora lutea; yet there were three ova in each half of the uterus, so that two must have crossed from the left to the right side.

But in the year 1863, Professor Luschka met with a case which seems to set all speculation at defiance. A woman died in the third month of gestation. From the right and rudimentary horn

[1] Verhandlungen der Physicalisch-Medicinischen Gesellschaft in Würzburg. Band iv, p. 1. Würzburg, 1854.

of the uterus it was found that a fœtus of ten weeks had escaped with its placenta through a laceration. The left horn of the womb was normally developed: its mucous membrane was not only swollen but detached, so as almost to form a loose bag, having the texture of the decidua, in the uterine cavity. There was no fœtus in this horn. The left ovary contained a corpus luteum in appearance corresponding with the period of pregnancy. There could not be seen any vestige of a corpus luteum in the right ovary: hence it was evident that the fœtus had proceeded from the left ovary. But the most careful examination failed to trace any communication between the developed and the rudimentary horns. The right horn was rudimentary, and was connected with the developed horn or uterus proper, by a solid largish cord which had a blind termination.[1] These conditions are well shown in the following drawing:

FIG. 11.



THE ANTERIOR VIEW OF THE MALFORMED UTERINE ORGANS OF A WOMAN WHO DIED AT THE AGE OF THIRTY-TWO. ONE-THIRD OF THE NATURAL SIZE. (After Luschka.)

The drawing shows the developed and rudimentary horns of the uterus. In the latter, there has been a lateral fissure; through which the fœtus has escaped with its placenta. Connecting the rudimentary with the developed horn, there is only a solid ligamentous cord.

Professor Luschka suggests, that as the transit of the ovum must have been extra-uterine, it may have been accomplished by the right Fallopian tube crossing over to the left side and

[1] Monatschrift für Geburtskunde und Frauenkrankheiten. Band xxii, p. 31. Berlin, 1863.

grasping the left ovary. Granting the probability of this being the case, however, the difficult question remains,—How did the ovule become fecundated? Did the oviduct of the developed horn first grasp its proper ovary, and then, when impregnation had occurred, loosen its hold so as to allow the right tube to take up the fecundated ovum? Improbable as this explanation seems, yet I confess my inability to solve the problem in any other way.

2. Varieties of Extra-Uterine Gestation.—Three orders of extra-uterine gestation were formerly described by authors; viz., ventral, tubal, and ovarian. In 1824, Dr. Breschet gave an account of a fourth form under the name of Graviditas in Uteri substantia.[1] Since this observer's day, the zeal of obstetric writers has led some of them to make as many classes of this abnormality as possible; and hence we find them detailing eight and even ten varieties. Such a minute subdivision, however, is perplexing and quite unnecessary; and partly therefore for these reasons, and partly on account of circumstances which will presently be evident, I shall only speak positively of three forms. These are—the tubo-ovarian, the tubal, and the interstitial or tubo-uterine varieties. At the same time it is allowed, that the possibility of ovarian fœtation can hardly be denied; although, while granting this, it may be asserted that such an occurrence is of extreme rarity. The fact must be remembered, that in the dissection of cases of extra-uterine pregnancy it is by no means constantly that the exact original seat of the ovum can be made out; for the inflammatory adhesions which the cyst-walls have contracted with all the surrounding tissues and organs, no less than the pressure which the fœtus has exerted upon these parts, give rise to a confused mass of disease which it is often impossible to unravel. Hence may be explained much of the discrepancy of opinion which has existed as to the possible seats of an extra-uterine gestation.

The *tubo-ovarian pregnancy* is that variety in which the cyst-walls are at first formed by the preternaturally firm union of the fimbriated termination of the Fallopian tube with a part of the ovarian parietes. As the ovum and its cyst progressively enlarge, the infundibular end of the oviduct gets greatly hypertrophied;

[1] Medico-Chirurgical Transactions, vol. xiii, p. 33. London, 1827.

while the cyst walls become united to the surrounding abdominal viscera and tissues. By this means the sac is not only strengthened, but—as it were—is partly formed by the adjacent intestine, omentum, mesentery, &c. Thus it has doubtless happened, that many of these cases have been described as examples of ventral fœtation, having their origin in the precipitation of the fecundated ovum into the cavity of the abdomen. Some years ago, the possibility of abdominal gestation was disputed; and the progress of physiological and pathological science since those days has materially served to strengthen, if not entirely to confirm, the correctness of these doubts. The fact has now been established by ample testimony, as I have already remarked, that the unimpregnated ovule quits the Graafian follicle at certain definite periods, and passes into the Fallopian tube and uterus. In one or other of these parts it either perishes, or becomes fecundated if a fruitful intercourse occur. Whether this law admit of any exceptions is uncertain. Yet it is an important question, whether the ovule may be impregnated before leaving the Graafian follicle, and consequently while it is still in the ovary? Were this point decided in the affirmative—as I believe it will be by-and-by—not only would one obstacle to the belief in ventral pregnancy be removed, but there could no longer be any difficulty in determining that cases of ovarian gestation might also occur. This would naturally follow from its being granted that the ovary was the seat of fecundation, and the successful coitus the cause of the escape of the ovum from the follicle; for of course it is easy to see, that under these circumstances and by some accident the ovum might be retained in the gland and there developed. And until the year 1825 it was generally allowed that this might happen,—that the fœtus might really be developed within the proper structure of the ovary, although the occurrence was thought to be by no means common. M. Velpeau, however, then began to doubt the truth of the alleged fact; and he brought forward four examples of supposed ovarian gestation, in all of which the tumor was found on careful dissection to be external to the proper coat of the ovary. Subsequent investigations have led many authors to indorse M. Velpeau's opinions; and Geoffroy St. Hilaire, Pouchet, Dr. Allen Thomson, Dr. Arthur Farre, and others, have expressed their strong doubts as to the possibility of the occurrence of ovarian gestation. One thing seems certain,

that not only have cases of tubo-ovarian pregnancy been mistaken for, and described as, true ovarian gestations; but that ovarian cysts containing hair, teeth, &c., which arise quite independently of pregnancy, have also been erroneously regarded in the same way.

Allowing the truth of all this, however, it appears exceedingly difficult to deny the possibility of ovarian pregnancy. Dr. Marinus, in his "Mémoire sur la Grossesse Extra-Utérine," after reviewing many of the opinions now held on this subject, says,— "Do these facts prove that conception cannot take place in the interior of the ovary? By no means, for to these facts we can oppose others quite as conclusive in favor of internal ovarian pregnancy. In the presence of observation, in questions of this nature, reason is silent. We have seen and examined in the anatomical and pathological museum at Wurzburg three anatomical preparations, which Hesselbach has described, consisting of ovaries, each containing in its interior a fœtus, of which the largest appears to be two and a half months old. The parietes of the germiferous gland are thickened and vascular internally, especially at the part where the placenta is adherent."[1] And again, at the New York Obstetrical Society, on the 21st February, 1865, Dr. Kammerer presented a specimen of extra-uterine gravidity, from a woman thirty years of age, who died in 1864. The case as related is brief, but it is explicit:

> The patient had been under Dr. Kammerer's treatment for chronic metritis; but all remedies had been discontinued, with the exception of the introduction of a large sound once a month, to keep the cervix open. Seven or eight years previously she had borne a child. She became again pregnant; and a little time subsequently was taken suddenly ill, with symptoms of internal hemorrhage and peritonitis. Death occurred in a few hours. At the autopsy, several quarts of blood were found within the peritoneal cavity; while on the left ovary, a rent revealing the source of the blood was seen. Opening the ovary, an embryo was discovered about four weeks old. No decidua was seen within the uterine cavity.[2]

Now as the preparation was shown to the members of the Society, and as no gentleman is said to have questioned the correctness of Dr. Kammerer's views, the conclusion that the case was really one of ovarian gestation can scarcely be shirked. And

[1] Journal de Médecine de Bruxelles. Vol. xlii, p. 430. Bruxelles, 1866.
[2] The New York Medical Journal. Vol. i, p. 141. New York, 1865.

indeed, in one respect it is more satisfactory than the three preparations seen by Dr. Marinus. For whereas Dr. Kammerer exhibited the ovary soon after removal from the body, the preparations examined by Dr. Marinus had been put up in spirit more than forty years previously. Finally, in the work of Bernutz and Goupil two examples of ovarian pregnancy are quoted, in both of which death occurred about the third month of gestation, from rupture of the ovary.[1]

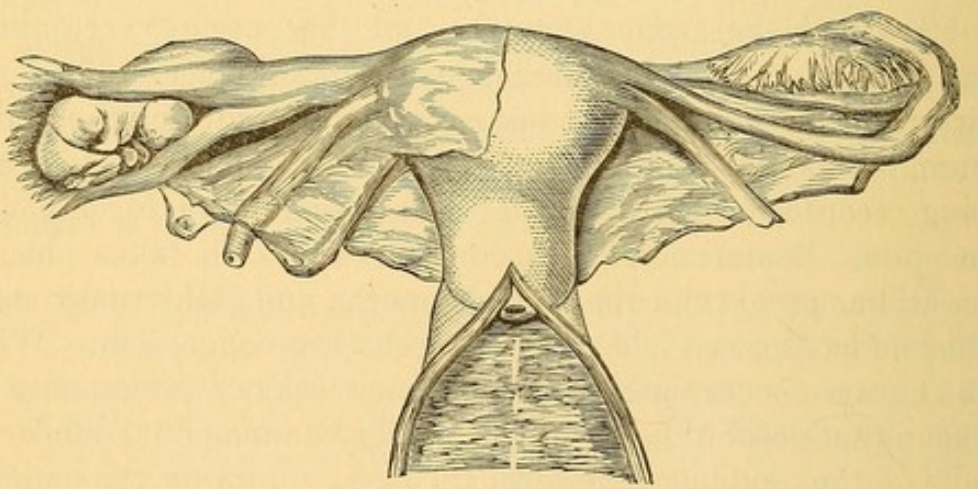
The *tubal* variety is much the most common of all the forms of extra-uterine pregnancy. This is just what might be expected when it is remembered that the Fallopian tube may so easily become the seat of fecundation,—the part where the essential male and female elements come into contact. When the ovum gets arrested and developed at some point of the oviduct between its expanded termination and the spot where it enters the uterine parietes, the walls of the tube get enormously dilated, and gradually become developed into an oval sac. As, however, these walls can only become expanded to a somewhat limited degree in most women, it usually happens that between the second and fourth month the tissues rupture; and the patient very quickly dies from the copious hemorrhage which takes place. The quantity of blood which may be poured into the cavity of the peritoneum, under these circumstances, is really immense; many cases being recorded where it is said to have amounted to eight and ten pints. Sometimes, rupture of the tubal wall takes place at an earlier period than the second month; and Rokitansky states that he has known it do so a fortnight after conception. When the rupture occurs within the first few weeks of pregnancy, the exact situation of the ovum can readily be made out; since the walls of the oviduct alone form the cyst containing the embryo, and they are generally found free from any adhesions to the neighboring viscera.

It has been suggested by Dr. Kussmaul, of Heidelberg, that many of the recorded examples of tubal pregnancy have been so designated erroneously; they having, in truth, been instances of gestation occurring in the stunted rudimentary horn of the so-called uterus unicornis. The uterus unicornis with the rudimentary horn, is equally adapted for pregnancy, as the same va-

[1] Clinical Memoirs on the Diseases of Women. Vol. i, p. 249, and note. Translated for the New Sydenham Society, by Alfred Meadows, M.D. London, 1866.

riety without the horn. But when the rudimentary horn contains the fœtus, we then unfortunately have—what does not otherwise occur—rupture of this part, expulsion of the embryo into the abdominal cavity, and fatal hemorrhage or peritonitis. The fissure of the rudimentary horn is always discovered near the origin of the Fallopian tube; while in these cases the developed horn is found thickened, and having a deciduous lining. When gestation occurs in the simple unicorn uterus, there appears to be neither difficulty nor danger; for many women with this malformation have borne several children. Pregnancy has also been known to exist in the rudimentary horn, when there could not be distinguished any previous channel of communication with the well-developed horn; but in these cases it has usually been said, that the seminal fluid has passed from the developed horn to the ovule discharged from the ovary in connection with the rudimentary horn, and that then the canal has become obliterated from changes occurring in the decidua.

FIG. 12.



TUBAL PREGNANCY.

The right Fallopian tube has been laid open to show the fœtus, which has arrived at about the third month of gestation.

The *interstitial* or *tubo-uterine pregnancy* is a rare variety of misplaced gestation. In it the ovum becomes developed at that particular portion of the canal of the tube which traverses the uterine parietes. Hence, the cavity containing the embryo appears as if constructed within the proper tissues of the uterus; and its parietes are indeed chiefly formed of the smooth muscular fibre, as in the ordinary gravid organ. As the walls of the sac

undergo development, they acquire considerable thickness; and consequently are often able to bear such excessive distension, that the pregnancy may go on until the full period, or even considerably beyond it. In some of these cases of graviditas interstitialis it happens very remarkably that the placenta is found in the proper cavity of the uterus, although of course the fœtus is wholly out of it. One of the most interesting examples of this, out of the four or five which are recorded by Patuna, Hoffmeister, Dezeimeris, &c., occurred in the practice of a Mr. Hay, of Leeds; who considered the case to be unique, and communicated the particulars to Dr. William Hunter. The chief points worthy of note are these:

The wife of A. B., aged thirty-five, of a good habit of body, was seized, when two months advanced in her second gestation, with pains resembling colic; but at the end of two or three days they were subdued by simple remedies. The pains did not return until four months afterwards, when they became much more severe and diffused than before. The acuteness of the attack was alleviated, but the intense suffering was always reproduced by the fœtal movements. At the close of the eighth, and again in the middle of the ninth months, there were false labor pains; and an examination per vaginam showed that the cervix uteri was harder and longer than Mr. Hay expected to find it at the stage of pregnancy to which the patient had attained. Near the end of the ninth month, a violent attack of vomiting set in, which lasted two days; and soon afterwards, the term of gestation being concluded, the movements of the child ceased, and the violent pain which had existed for nearly four months subsided. The breasts began to swell, and milk soon flowed from the nipples; complaint was made of an uncommon coldness in the abdomen; there were frequent attacks of spurious labor pains; there was a trifling sero-sanguineous discharge from the vagina; and the patient suffered much from violent sickness. In three months from the time that labor ought to have come on, death put an end to the misery. The post-mortem examination revealed the existence of old adhesions between the omentum, intestines, peritoneum, and a large peculiar sac, which occupied nearly the whole abdominal cavity. Besides a well-formed fœtus, free from every mark of decomposition, the cyst—the walls of which were about one-eighth of an inch thick—contained some chocolate-colored fluid and a little pus. The umbilical cord passed from the abdomen of the fœtus through a narrow aperture, into a cavity whose walls were from one-half to seven-eighths of an inch in thickness; which cavity was found to be that of the uterus, and to be of much smaller dimensions than the sac which contained the fœtus. The placenta was very large, and with the uterus weighed two and a half pounds avoirdupois. The Fallopian tube on the left side was very small; the place of that on the right was occupied by the beginning or orifice of the sac.[1]

The foregoing history seems to be highly instructive in several

[1] Medical Observations and Inquiries. By a Society of Physicians in London. Second edition, vol. iii, p. 341. London, 1769.

points of view: First, from the fœtus having been just as well developed in its abnormal position as it would have been in a normal pregnancy; secondly, from the efforts which were spontaneously made to expel the child at the termination of the natural period of pregnancy; and thirdly, from the placenta having been attached to the internal surface of the proper uterine cavity, instead of to the walls of the artificial sac. The fœtus seems certainly to have perished as soon as it had completed the ordinary nine months of intra uterine life. This has not always happened, however; inasmuch as some cases have been noticed where the child would appear to have continued to live and grow for a few weeks beyond the average term of gestation.

3. Symptoms of Extra-Uterine Pregnancy.—These are very much the same in all the varieties. Speaking generally, the patient usually believes herself to be pregnant in a normal manner. There is at first but little constitutional disturbance, or not more than is common in natural gestations; nor is any marked local uneasiness experienced so long as the part containing the embryo can accommodate itself to the foreign body. Indeed, in many recorded cases it is remarked that the women have enjoyed excellent health, or that they have been free from any unusual symptoms until the close of the seventh or eighth month; though certainly in others the most severe suffering has been complained of after the first few weeks.

In most instances, the catamenia are suspended; though in many the flow appears regularly, and in some is then profuse. When there are indications of much uterine excitement, it is not uncommon for the patient to have attacks of flooding; on which occasions, as coagula and masses of fibrine are passed, erroneous suspicions may be entertained that abortion has taken place. The breasts enlarge and the areolæ darken, as in ordinary cases. Sometimes there is morning sickness, but this is often absent, and is seldom very severe; the patient being more frequently annoyed with diarrhœa and troublesome tenesmus, as well as with irritability of the bladder. Where the gestation continues, the fœtal movements are felt at the usual period of quickening. The abdomen also becomes enlarged and tender to the touch, the increase in size being evidently one-sided; though in rare examples the enlargement is regular and symmetrical, and merely has a

form differing from that of natural pregnancy. The fitful but severe attacks of pain which are experienced in the pelvis, as well as in the hypogastric and inguinal regions, are particularly characteristic of this condition. Sometimes these attacks pass off in a few minutes; on other occasions they continue for hours, and induce great depression of both mind and body. The late Dr. Heim, of Berlin, was in the habit of teaching, that during these paroxysms of pain the patient speaks in a so-called "characteristic" whining tone of voice; which, it was said, could not be mistaken when once it had been heard. Most observers, however, now regard this opinion in the light of a fallacy. On instituting a vaginal examination when the gestation has so far advanced that there is palpable abdominal enlargement, a pelvic tumor may perhaps be detected, in addition to the uterus; or an irregular portion of the fœtus will sometimes be felt occupying the recto-vaginal pouch, and pushing the uterus close to the pubes. More commonly, however, the fœtal tumor is out of the cavity of the pelvis; the os uteri being likewise reached with some difficulty, owing to the uterus being drawn above the pelvic brim. The cervix, if felt, may be found congested; while the uterine cavity though somewhat enlarged is empty, as the use of the uterine sound will prove. It need scarcely be said, however, that this instrument must be employed with very great caution; and only when the diagnosis is otherwise tolerably clear, or at all events when there are distinct indications that there is no normal pregnancy. The evidence derived from practising auscultation over the tumor is often unsatisfactory. If there be much pressure upon the aorta or iliac arteries, a loud and diffused blowing sound will be perceptible. The fœtal heart is not always to be detected, even when the child is alive; but if heard, it is usually only audible over a limited space, at a much higher point in the abdomen than in healthy pregnancy advanced to the same period, and at uncertain times.

When an extra-uterine pregnancy terminates in rupture of the cyst, exceedingly grave phenomena ensue. The time at which the walls give way is liable to some variation; but in tubal gestation—the form with which we are best acquainted—it undoubtedly very generally happens between the commencement of the second and the end of the fourth month. The premonitory symptoms may be so slight as to pass unnoticed, or they may be

well-marked. In the latter case, the most characteristic are,—impairment of the health, languor and mental depression, prostration, nausea and vomiting, irritability of the bladder and rectum, abdominal pains, and sanguineous discharges from the uterus. With the tubal form also, laceration perhaps generally occurs suddenly without any warning, and while the patient is in the enjoyment of good health. But in any case, immediately after the rupture, the most excruciating and sickening abdominal pains set in; which gradually increase in severity up to a certain point, and then suddenly and completely subside. The abdomen sinks, the tumor disappears and a feeling is experienced as of something having given away. The surface of the body quickly becomes cold and pale; the countenance gets anxious; the sickness is most distressing; and the pulse is found to be very quick and contracted or feeble. In a very short time, cold clammy sweats break out; and while the poor victim is expressing herself as feeling comfortable and free from pain, perhaps a few convulsive rigors occur, and death takes place from the internal hemorrhage. Should the bleeding be less copious the patient often rallies after a time from the first shock, and for some hours hopes of recovery are entertained. But these happy dreams are soon dispelled, acute peritonitis sets in, and a fatal termination commonly occurs before the close of the third day. If, under the judicious use of opium and other remedies, the patient be enabled to resist the violence of the inflammatory symptoms, she may still perish at a rather later period from exhaustion; yet this danger being likewise avoided, there is a chance that the product of gestation will become inclosed in a new cyst, and that the woman may be restored to a certain degree of health.

Supposing the fœtal cyst to remain uninjured, there is still a fear of hemorrhage occurring within the sac; in which case death can happen without a drop of blood being poured into the peritoneal cavity. Or, the cyst continuing entire, there is the risk of the dilated utero-ovarian veins getting ruptured: while in tubal pregnancy, the walls of the canal may alone be broken, and fatal hemorrhage result. These perils surmounted, however, the gestation may advance more or less nearly to the close of the natural term. Then labor pains will come on; which efforts at parturition usually continue for three or four days and then subside, perhaps to return at uncertain intervals

during the few succeeding weeks or months. Indeed, cases have been reported where the pains of childbirth have recurred at intervals for more than three years; while in an instance published by Lospichler, the attempt at labor returned every nine months for a period of six years. Generally, the fœtus dies either before or just after the completion of the ninth month; but instances are recorded where vitality seems to have been retained for as long a time as four, or even five months, beyond this period.

With the cessation of the fœtal life, the walls of the cyst would appear slowly to undergo a process of degeneration; so that in a space of time varying from a few weeks to some years suppuration occurs, followed by ulceration and perforation into the neighboring viscera. Thus, the fœtal débris ultimately gets discharged by openings forming through the walls of the vagina, rectum, bladder, stomach, or abdomen. Although the process of expulsion, in this way, is very tedious and greatly endangers the mother's life, yet many women recover from it. Indeed, Dr. Campbell mentions two cases where the patients each had the products of three extra-uterine gestations in their abdomens at the same time; while in both individuals all the decomposed structures were evacuated through the abdominal parietes, and each recovered. The following interesting case has been recorded by Dr. Galiay, in which extra-uterine pregnancy occurred twice in succession in the same patient, and terminated favorably on both occasions. The history, abbreviated from the report, is as follows:

A young woman shortly after marriage, was laid up for several days in consequence of injuries which she received during a quarrel. She recovered without much inconvenience, and soon afterwards found that she was pregnant. The pregnancy seemed to follow the usual course, until—at the proper time—symptoms of labor set in; but the pains went off without being followed by any result. Months passed away, during which she remained of great size; until, after a long interval, she was seized with acute but intermitting pains in the abdomen and groins and anus. After a considerable period—in 1829—a violent attack of pain came on, accompanied by a desire to evacuate the bowels; but she was unable to relieve herself. On examination, the bone of a fœtus was found firmly impacted within the sphincter ani; which being removed, she passed a number of other bones, and then got well. Until 1834 she enjoyed good health, when she again became pregnant. After some interval as before, the fragments of another fœtus were expelled per anum, without pain or constitutional disturbance.

It is noted that she soon regained her health, and was well when the case was reported.[1]

The length of time that a fœtus and its envelopes may sometimes be retained as a foreign body within the organism of the mother, without producing serious mischief, is very remarkable. The following case is perhaps one of the most curious on record:

Anna Mullern, of the village of Leinzell, near Gemund, in Suabia, died at the age of ninety-four, after she had lived a widow forty years. Six-and-forty years before her death she declared herself to be with child, and had all the usual tokens of pregnancy. At the end of her reckoning the waters came away, and she was taken with the pains of labor. These continued upon her seven weeks, and then subsided under the use of medicine. Some time after this she recovered perfect health; except only that her belly continued swelled, and that now and then, upon any exercise, she felt a little pain in the lower part of it. Subsequently, she had two healthy children; but remained firmly persuaded that she was not delivered of what she first went with. On the 11th March, 1720, she died; and a large hard mass was then found in the abdomen inclosing a fœtus.[2]

A remarkable case, somewhat analogous to the foregoing, occurred in the practice of Dr. Montgomery:

In the year 1828, a woman was admitted into the Cork Street Fever Hospital, with considerable enlargement of the abdomen. Her history was, that eight years previously she had been in labor two days, when the pains suddenly ceased; and the child instead of being born, rose up—as she expressed herself—into her stomach. After remaining in bad health for about two years, she again experienced the symptoms of pregnancy; and this time gave birth to a child which did not survive. The former child still remained in the cavity of the belly; and during its continuance there, she bore three children, the last of whom lived. Ultimately a fistulous opening formed near the umbilicus. This opening was enlarged, and the original child removed. It was in a state of wonderful preservation, measured twenty-two inches in length, and had attached to it about two feet of the umbilical cord.[3]

The particulars of a third noteworthy instance may be also mentioned:

A woman, forty years of age, was suddenly seized with symptoms of internal strangulation, from which she sank. Dr. Christian, under whose care she was, discovered in the abdomen a large tumor, situated in the right iliac fossa and lumbar region. This tumor had first appeared some months after her marriage, twenty years before, at which time labor had come on at the

[1] Gazette Médicale de Paris. 29th July, 1837.
[2] The Philosophical Transactions Abridged, vol. vi, part iii, p. 212. London, 1733.
[3] The Signs and Symptoms of Pregnancy. Second edition, p. 350. London, 1856.

sixth or seventh month, without any result: the movements of the fœtus having suddenly ceased, and the labor itself having been arrested. After this period she had borne eight children. The autopsy showed a tumor of the size of a large ostrich's egg, enveloped in a cyst with ossified walls, except at its superior part, and inclosing a fœtus of six or seven months. This was as well preserved as if it had been artificially inclosed after the labor,—still having its umbilical cord fixed to the interior wall of the envelope which represented the placenta, and which was completely ossified.[1]

Dr. R. Wagner has described the dissection of a remarkable case of lithopædion:

A woman, aged sixty-eight, died suddenly. She had borne five children at twenty-four years of age. Subsequently she believed herself again pregnant, when she fell sick with typhus. During this illness the movements of the child ceased. Notwithstanding that the infant had been retained twenty-nine years in the abdomen it was entire, although much contracted. It weighed 3½ lbs., and was of the size of a child's head. The soft parts were much dried; some bones showed strong calcification; the scalp and one ear had grown to the membranes. Whether the extra-uterine gestation was primary or secondary Dr. Wagner does not decide. The woman had rejected an offer of Cæsarean section twenty-nine years before.[2]

In a case of tubular gestation, with probable rupture, related by Mr. R. W. Watkins, the fœtus had been retained in the cavity of the peritoneum for more than forty-three years. During this time, the foreign body had given rise to no local or constitutional effects of any importance. The woman's death, at the age of seventy-four, was due to chronic renal disease. The autopsy revealed a mummified lithopædion, connected by its umbilical cord to the placenta; this organ having its attachment to the peritoneal covering of the broad ligament near the left ovary. The uterus was healthy.[3]

Another history that may here be quoted, is one which shows that it is possible in instances of twin conception for one embryo to be properly developed in the uterus, while the other is lodged in one of the oviducts:

On the 9th April, 1849, Dr. Craghead, of Danville, Virginia, was called to a negro woman belonging to a Mr. Conway. She was thirty-five years

[1] Quoted by L'Union Médicale, tome v, p. 334, Paris, 1851,—from The Philadelphia Medical Examiner.

[2] Archiv für Heilkunde, 1865. Quoted from The British and Foreign Medico-Chirurgical Review. Vol xxxvii, p. 537. London, 1866.

[3] Transactions of the Obstetrical Society of London. Vol. viii, p. 106. London, 1867.

old, of strong constitution, and had previously enjoyed excellent health. She had one child at an early age; lived without a husband till she was nearly thirty, when she married; and shortly afterwards gave birth to her second child. Again she lived "sine marito," in which state she remained until the Christmas of 1848. Having menstruated early in January, 1849, and not since, she supposed herself pregnant. About the 1st of April, she complained of pains resembling those of colic; in consequence of which her master bled her, and gave her an aperient with occasionally a dose of laudanum. Dr. Craghead found the poor woman feverish, and complaining of considerable abdominal pain and soreness; while upon examination a tumor was discovered in the left iliac region, which was excessively tender. Bleeding was again resorted to, and calomel and opium administered; and on the 17th April she was so much better that she spoke of walking out. She took some cathartic pills at bedtime. In the night she awoke in pain and made several ineffectual efforts to evacuate the bowels, remarking that she felt "as if there was something in her which ought to come away." A few hours afterwards she was found in a state of collapse; with a cold skin, scarcely perceptible pulse, a swollen abdomen, tenesmus, &c. About the evening she rallied; and continued to improve slightly until towards the close of the day of the 19th April, when labor pains set in, and in a short time she aborted. The fœtus was well-formed, five inches in length, and evidently of rather more than three months' development. The mother lived until the evening of the 21st, when she died rather suddenly. On making a post-mortem examination, the whole abdominal cavity was found filled with coagulated blood and serum, which had proceeded from the rupture of some of the vessels of the left Fallopian tube. This tube was greatly enlarged and converted into a membranous sac; which sac contained a fœtus of the same size as the one delivered per vias naturales. In other words, it was well-formed, five and a half inches long, with a cord and placenta.[1]

But one of the most extraordinary instances with which I am acquainted, of uterine and extra-uterine pregnancy, progressing simultaneously to the full period of gestation, has been reported by Mr. Louis R. Cooke. The principal features in the patient's history, as related to the Fellows of the Obstetrical Society of London, on the 3d June, 1863, are these:

E. R—, aged thirty-nine years, who had previously had three natural deliveries, was taken in labor on the 8th December, 1862. During the pregnancy there had been no great inconvenience, beyond dragging pains and an unusual sense of weight in the abdomen. On an external examination, the abdominal swelling was found to have its greatest prominence considerably to the left side, and about on a level with the umbilicus; the whole tumor also being more circumscribed, better defined, and more spherical in form than usual. The limbs of a fœtus were distinctly traced through the abdominal walls; while a placental souffle was audible over a large portion of the tumor. A vaginal examination showed the canal much elongated, its

[1] The American Journal of the Medical Sciences. New Series. Vol. xix, p. 114. Philadelphia, 1850.

rugæ obliterated, and the os uteri drawn up out of reach. Suspecting an abnormal gestation, Mr. Cooke requested Mr. Spencer Wells to see the patient with him, and he attended with Dr. Kuman, of Vienna. It was thought there were two sets of fœtal heart-sounds; while the extensive surface over which the placental bruit was heard gave rise to a suspicion of two placentæ. The opinion given, therefore, was that a double uterine fœtation existed. As the pains were slight, and occurred only at long intervals, the bladder was emptied and a grain of opium administered.

On the 9th December, it was found that Mrs. R. had passed a good night. At six o'clock in the afternoon strong labor pains set in, and Mr. Cooke was sent for. On making an examination, he discovered that the sacral concavity was now occupied by a firm and resisting and rounded tumor, which was immovable. Its presence reduced the antero-posterior diameter of the inlet to less than two fingers' breadth. The os uteri was completely dilated; and a small portion of the convex cranial surface of a fœtus could be reached. In consultation with Dr. Greenhalgh and Mr. Meates, it was decided to put the patient under the influence of chloroform, so as to suspend the action of the abdominal muscles; in order that an attempt might be made to displace the tumor, and turn the child. Failing in this, the Cæsarean section was to be performed. However, after the employment of some force, the tumor was pushed out of the vagina, and delivery completed by version. The child was dead. The placenta was removed without difficulty. The woman became very much exhausted, and gradually sank; death occurring within forty-eight hours of the operation.

At the autopsy, twenty-one hours after death, the abdomen was carefully opened; when the first thing revealed was the body of a full grown female fœtus contained in its membranes, which were unruptured and full of fluid. The anterior or external surface of the chorion was perfectly smooth, and in immediate relation with the abdominal peritoneum. Beneath the tumor the uterus was seen, partially contracted and unruptured. On opening the fœtal membranes and removing the fœtus, it was found that the placenta was firmly attached to a shallow capsule formed of the expanded and enlarged fimbriæ of the right Fallopian tube, which was much elongated. A stylet could be passed along the tube from its uterine extremity to the expanded portion, when it became arrested by the placenta.[1]

Two other cases, somewhat resembling the foregoing, have been reported. In one, by Pellischek, it seems certain that extra-uterine gestation was complicated with uterine pregnancy; for this physician having delivered the uterine fœtus, felt another living child in the left hypochondrium while he was extracting the placenta. It was determined not to interfere. At the end of a year the tumor had much diminished, and the mother was enjoying good health.[2] The second instance has been related by Dr. Pennefather. The points of interest are as follows:

[1] Transactions of the Obstetrical Society of London. Vol. v, p. 143. London, 1864.

[2] A Biennial Retrospect of Medicine, Surgery, and their Allied Sciences, for 1865–66, p. 396. Published by the New Sydenham Society, 1867.

A lady, aged thirty-eight, the mother of five children, miscarried in August, 1861. She again became pregnant in the following October. In April, 1862, she was seized with violent pain in the abdomen, which was relieved on passing a large quantity of scybala. Tenderness and vomiting and flatulence remained. The abdomen attained an enormous size subsequently, and there was almost constant sickness. On the 4th September, a full grown female infant was born. As the abdomen remained large, it was examined: the fœtal tick and movements were distinguished. Ergot was given: it acted powerfully on the uterus, but no second child was born. It was then believed that this fœtus was extra-uterine. The patient subsequently got about, but suffered much both locally and constitutionally. In March, 1863, an opening formed in the vagina, through which a portion of fœtal skull protruded. By dilating the opening, a full grown male child was gradually brought forth. For some days all the fæces passed by the vagina. But the wound ultimately closed, and the patient made a complete recovery.[1]

From the symptoms and histories of the typical cases which have now been detailed it seems evident, that the diagnosis of extra-uterine gestation is very often surrounded by great difficulties. It is therefore incumbent upon the practitioner not to form an opinion from the existence of any single feature in the history or examination of a given case; but rather to draw his conclusions from a careful analysis of all the symptoms presented. It has been from a neglect of this precaution, that medical men have laid open the abdominal cavity to extract imaginary infants. A fertile and lively fancy has been allowed to paralyze the judgment. Even Dr. Ernest Ludwig Heim, who—during a practice extending over sixty years—had under his observation thirty-three cases of misplaced gestation, permitted and indeed persuaded a woman to submit to gastrotomy, where there was found neither a fœtus nor a tumor of any kind. This instance has been already quoted (Chap. III, div. 1); but it may be mentioned that the mistake seems to have been caused by Heim's attaching undue importance to the occurrence of severe intermitting pains, the cessation of the catamenia, the existence of a peculiar moaning cry, and the patient's assertions that she daily felt the movements of the child.

The importance of making a correct diagnosis need not be further enforced by examples of the sad results which have followed from careless or inexact observation. It is obvious, that the position of a woman suffering from such a gestation as we are now considering is a most critical one; and if our treatment is to

[1] The Lancet, p. 688. London, 20th June, 1863.

have any effect in retarding or preventing the rupture of the cyst, it will only be through its being practised at an early date.

4. Treatment of Extra-uterine Pregnancy.—This part of our subject may be advantageously considered under three heads: viz., first, the precautions which are needed to prevent or retard rupture of the cyst; secondly, the measures which offer a chance of moderating the hemorrhage that always follows laceration; and thirdly, the steps to be pursued after the extinction of fœtal life.

(1) The importance of preventing or even retarding laceration of the cyst cannot be over-estimated. When the cyst ruptures within the first few weeks of gestation, this accident is invariably fatal to the mother. Where this occurrence is delayed until a more advanced period, the event—though generally most disastrous—does not inevitably cause death. Supposing, therefore, we find a patient presenting, in addition to the ordinary signs of pregnancy, such symptoms as have been already detailed, every precaution must be taken to prevent bodily fatigue, mental agitation, or the least extraneous irritation of the uterine organs. In other words, a pregnant woman who has occasional sharp attacks of abdominal pain, a frequent sanguineous discharge from the vagina, a tumor in either iliac region, and a womb so drawn up into the vagina that its mouth and cervix can only be reached with difficulty, ought to be kept free from excitement of every kind. The most rigid quiet and rest in the recumbent posture should be enjoined; sexual intercourse is to be strictly forbidden; all stimulants must, as a general rule, be disallowed; the diet had better be light, and perhaps meagre; and the patient's apartment should be well ventilated and not overheated. Moreover, undue action of the abdominal muscles by vomiting, straining at stool, lifting heavy weights, &c., is to be restrained; and immediately any pain is experienced, or there are any symptoms of the commencement of uterine contractions, opium—either by itself, or especially in conjunction with belladonna—must be freely administered. These drugs will prove invaluable if judiciously used; and perhaps, speaking generally, it will be found much more advantageous to give them by the rectum than by the mouth.

An interesting question here presents itself—viz., Can we in any way destroy the embryo at an early period, so that by pre-

venting its further growth the integrity of the cyst may be maintained?

There are, I believe, at least three ways in which this may probably be effected. In the *first* place, the injection of half a grain of morphia, in solution, through the vaginal wall into the cyst, will probably prove fatal to the embryo. Remembering the susceptibility of the new-born infant to opium, it can readily be imagined that a young fœtus must succumb when the fluid around it is impregnated with this drug. In having recourse to this proceeding it will be found that the syringe usually employed for hypodermic injections answers very well.

Secondly, by withdrawing the fluid contents of the fœtal cyst through a fine and long trocar and canula the same object may be gained. The puncture can either be made through the abdominal parietes, or preferably through the vagina. The same amount of care is necessary as would be employed in evacuating the fluid contents of a hepatic hydatid tumor. A case which I believe to be unique, and which happily illustrates the value of this plan of treatment, has occurred in my own practice:

On the 4th July, 1867, I was requested by Mr. Marsh, of St. John Street, Clerkenwell, to see Mrs. W. in consultation with him. The fear was that pregnancy existed, and that the uterus had become retroverted.

From the patient I learnt that her age is thirty. She has been married seven years. Has had one abortion, and three living children: the last child was born in April, 1865. Has not been pregnant since until the present occasion; is convinced she is now in the family way. The catamenia, which are always regular, were due on the 20th March, but they did not come on. During April and May she had frequent attacks of "spasms and sickness." On the 25th May, the courses came on rather profusely and lasted for one week: they have not been on since. Now suffers from sickness, great pain in the pelvis, difficult micturition, and severe attacks of spasm. On making a vaginal examination, I found the whole recto-vaginal fossa occupied by a tumor, which gave me the impression of being cystic, though no fluctuation could be detected. The cervix uteri was pushed towards the pubic arch. The tenderness of the parts was, however, so excessive that only an imperfect examination could be made. It was therefore determined to administer a full dose of opium, and wait for twenty-four hours.

On the following day she was placed under the influence of an anæsthetic (a mixture of equal parts of chloroform and ether). On then examining, I felt convinced that the tumor was not formed by the uterus, but that in all probability it was a case of pelvic hæmatocele caused by an extra-uterine fœtation. To make sure that there was no natural pregnancy I allowed the sound to glide into the uterine cavity: without employing the least force it entered for five inches. As the symptoms were urgent, Mr. Marsh agreed in the propriety of puncturing the swelling behind the uterus. I therefore

passed a very fine trocar and canula into it, and allowed a tumblerful of almost pure blood to flow away. By this operation considerable relief was given for a time. Especially was the sickness checked, so as to allow of the free administration of nourishment. Still her condition was a perilous one; at one time being much better, and at another making both Mr. Marsh and myself anxious for the result.

On the morning of the 8th August she had an action of the bowels, with sufficient difficulty to attract attention. On examining the bed-pan, there was found in the motion a flattened and decomposed, but quite perfect fœtus. This had arrived at about the third month of development. Immediately afterwards, improvement set in. By the end of the month she was free from every unfavorable symptom, and was able to sit up.

Thirdly, in place of either of the foregoing plans, recourse may be had to electro-puncture. The following case shows that this operation has been attended with success; while it serves to illustrate the method to be pursued:

Madame Marie-Anne Ceccherini, of Pisa, twenty-nine years of age, and the mother of four children, presented in the third month of her fifth pregnancy, at the commencement of 1853, a tumor in the left iliac fossa. This was looked upon by Dr. Bachetti and Drs Burci, Torri, and Bartolini, who were called in consultation, as the result of a tubal extra-uterine fœtation. It was first attempted to arrest the development of the fœtus, and consequently to prevent the fatal hemorrhage, by frictions of belladonna, and afterwards of the iodide of mercury; but recourse was finally had to electro-puncture, with the view of destroying the fœtus, this being accomplished by the implantation of two needles into the tumor, and then by directing into the latter an electro-magnetic current. Some pain was experienced by the patient, but it was surmised that the development of the fœtus was arrested. Nor were the physicians disappointed in this respect. The tumor rapidly diminished, and was reduced to the size of a pigeon's egg, after having been as large as a man's fist. Moreover, the catamenia, which had not appeared for three months, returned; and the patient was ultimately dismissed as cured.[1]

It may of course be asked whether the diagnosis in this instance was quite correct, and whether the tumor might not have been simply an ovarian one. But taking all the circumstances of the case into consideration, I think it may justly be said that most probably the opinion of Dr. Bachetti was quite right, and that the electro-puncture destroyed the fœtal life.

(2) Unhappily it very often happens that the patient is seen by the physician for the first time when rupture of the cyst has taken place. She is found, under these circumstances, in a state of collapse; with an anxious exsanguined countenance, a hardly

[1] L'Union Médicale. Tome xi, p. 168. Paris, 1857.

perceptible pulse, and rapidly sinking vital powers. Endeavors must then be immediately made to obviate the alarming tendency to death by syncope. Brandy, or any stimulant which may be at hand, ought to be freely given. The patient's head should be laid rather lower than the trunk. A full dose of solid opium—such as two or even three grains of the extract—had better be exhibited. Although I have no faith in such applications, yet it is only orthodox to recommend that pounded ice, or ice and salt, or cloths dipped in cold vinegar and water, be placed over the abdomen, in order to moderate the bleeding if possible. Should these means fail, but little more can be done. Yet there are possibly to be found practitioners of sufficient boldness, who would give the patient such a desperate chance as might be afforded by opening the abdomen, and attempting to stop the bleeding by placing a ligature round the uterine end of the oviduct.

(3) As regards that more fortunate class of cases where no laceration takes place and the pregnancy goes on to the full term, the fœtal life generally becomes extinct soon after the cessation of the ineffectual labor pains. In these instances, the fœtus can either remain as a foreign body in the maternal abdomen and give rise to little or no inconvenience; or suppuration will take place within the cyst, its walls may become adherent to the surrounding viscera or parietes, and subsequently an opening may form through the latter, or ulceration may take place into the rectum or vagina, or bladder. When an opening is thus spontaneously made through the abdominal parietes, the aperture can often be most advantageously enlarged to permit the removal of the putrefied fœtus. This proceeding was first successfully performed in the year 1550, again in 1590, and in many instances subsequently. Dr. Campbell well remarks in his *Memoir on Extra-Uterine Gestation*, p. 150, that "when the suppurative process is established, or a breach is actually formed in the parietes of the abdomen, experience proves that the integuments may, with safety, be largely incised, or the pre-existing aperture freely dilated with success. Of thirty cases in which gastrotomy was performed, or the breach dilated, twenty-eight patients recovered. In twelve cases of gastrotomy performed after the suppurative process was well advanced, ten of the operations were successful. Of nine women operated on, however, during the existence of fœtal life, or soon after its extinction, the whole died. By these fifty-one operations,

only two children were preserved; and in one of these even, the details are too marvellous for belief." The important fact here mentioned, that all the women operated upon during the existence of fœtal life, or soon after its extinction, died, must not be forgotten; for it proves to my mind conclusively, that gastrotomy should never be performed with the object of preserving the fœtus. Indeed, if adopted at all, it ought not to be resorted to until some time after the child's death; when the system of the parent—though affected by the irritation set up by the fœtus—has been restored as nearly as possible to the condition of the non-pregnant state.

Whether the employment of a powerful caustic is likely to be more successful than the use of the knife, or whether the abdomen may be safely opened at an earlier period by the former than by the latter, cannot now be decided. Perhaps, however, the following instructive case may serve to throw some light on this question. The report by Dr. Martin runs thus:

The patient was the wife of a *propriétaire*, in one of the country districts of France. She was thirty-six years of age, of sound constitution, and had married when nineteen years old. One year afterwards she gave birth to a child: but she did not again become pregnant until after an interval of fifteen years, at the end of October, 1855. Towards the close of the December of the same year she was seized with violent pains, resembling those of labor; which were followed by true peritonitis, with intense fever. When this had been subdued, the abdomen, which before presented nothing remarkable, had so changed in form as to give rise to the supposition of extra-uterine gestation. Difference of opinion upon this head prevailed among those consulted; and there is no account of the progress of the case until the beginning of August, 1856, *i. e.*, the termination of the normal period of pregnancy. Then pains, as if announcing approaching delivery, set in; but these were at first irregular, vague, and purposeless. On the 8th August, however, they had become severe; and now on examining the uterus, no doubt could be entertained of the existence of extra-uterine pregnancy, and the urgency for interference became obvious. It was determined by the practitioners consulted in the case, in order to prevent effusion into the peritoneal cavity to secure the formation of adhesions between the cyst and the walls of the abdomen by the employment of caustics for effecting the opening. The first application was made on the 11th August (the mother had felt the child move the evening before, although no sounds were audible to the ear), the caustic paste being so directed as to produce an eschar about eighteen inches in length, running parallel to the linea alba, and being about three fingers' breadth to the left of the umbilicus, which was situated opposite to the middle of the eschar. The application of the paste—the composition of which is not stated—was repeated twice, and Canquoin's paste was also applied three times; the mortified parts being carefully removed by the bistoury after each cauterization, and the caustic again applied at the bottom of the wound. After the fifth

application the cyst and the membranes were opened, not a drop of blood having been lost. On the 26th August, *i. e.*, fifteen days after the first application had been made, extraction was performed. Much liquor amnii, discolored by meconium, had already flown away; and on pushing back the head, which projected through the artificial opening, the fœtus was found to be free and floating as in its natural cavity. The cyst, which was a line and a half in thickness, was intimately united by solid adhesions to the internal wall of the abdomen, so that no fear existed of effusion into the peritoneum. The edges of the aperture were enlarged as much as possible by the removal of the debris of the eschar, without going beyond the limits of the cauterization, or giving rise to bleeding. As the child was dead and the head very large, an incision was made into the scalp, so that the frontal and parietal bones might be extracted Pelvic version was then performed with great facility, and a well-developed child removed About half an hour after severe hemorrhage came on; and the placenta was found to be so adherent to the cyst as to require to be detached piecemeal. The bleeding then ceased, but the patient suffered from prolonged syncope, requiring the use of restoratives. Compresses soaked in vinegar and water were applied to the wound, and kept on by means of a towel, which exerted moderate compression on the abdomen. These were left on for three days, when the coagula of blood which had formed in the cyst were removed. During the first four days the patient felt very enfeebled, but no inflammation supervened; and at the end of a week she was comparatively well and comfortable. Every day injections were thrown into the wound, at first of an emollient, and afterwards of an astringent nature. Gentle laxatives were given from time to time, and the strength was kept up by good diet. At the end of the third week she was able to walk in her garden. The last report comes down to the 25th September, when she appeared to be going on quite well, getting up every day. The wound was still an inch in length and six in depth, but in a very healthy state.[1]

Two instances were recorded in 1860, in which the operation of abdominal section was successfully resorted to by Dr. Stutter of Sydenham, and Mr. Adams of the London Hospital, for the removal of dead extra-uterine infants retained several weeks beyond the full period of pregnancy.[2] In both of these cases, the risk of using the knife appeared to be much less than the danger arising from the constitutional irritation which was set up by the fœtus. But out of fourteen other recorded cases, in which abdominal section was performed without the previous formation of any fistula, recovery only followed in five. It is also deserving of notice, that in the two successful instances above referred to the afterbirth was found firmly adherent. Consequently no attempts were made to extract this organ; although in Dr. Stutter's

[1] Revue Médicale. Tome ii, p. 673. Paris, 1856.
[2] Medical Times and Gazette, pp. 55 and 57. 21st July, 1860.

case the placenta loosened and was removed *en masse* on the fifth day after the operation, while in Mr. Adams's patient the cord was expelled on the fourth day with portions of disintegrated placenta. The fact can be statistically proved, that the forcible removal of the placenta, unless this structure be found quite loose, adds very much to the danger of the operation.

Attempts have occasionally been made to extract the fœtus *en masse* by an incision through the walls of the vagina; and in a few apparently well-selected cases, success has been the result. Thus, of ten examples, the mother recovered in six; while in three the infant's life was also saved. Unless, however, some prominent part of the child's body can be distinctly traced through the wall of the vagina, or unless there are peculiar and very urgent reasons for interfering, it will be better to trust to an expectant line of treatment, which if less brilliant is more secure. Cazeaux relates, that in a case where the head of the fœtus, from being wedged at the superior strait, could readily be felt through the posterior and upper part of the vaginal parietes, Professor P. Dubois—notwithstanding sharp opposition from several of his colleagues—resolved upon freely incising the vaginal wall and cyst, so that he might apply the forceps and remove the child bodily. After the incisions had been made, however, an intimate adhesion was discovered between the cyst walls and the fœtal head, which prevented further proceedings. Nevertheless, the operation was not without benefit; for in the course of a few days it was followed by the discharge of a putrid mass comprising all the soft parts of the fœtus. Subsequently, the detached bones of the skeleton were gradually extracted, the cystic walls slowly contracted, the opening healed by degrees, and at the end of two months the woman was completely cured. At the time of operating the patient had been pregnant twenty-two months.

CHAPTER VIII.

SUPERFŒTATION.—MISSED LABOR.

1. Superfœtation—The possibility of its occurrence often denied—Many of the cases brought forward to support it, to be explained on other grounds—The chief varieties of double uteri—Superfœtation may occur where the uterus is not bilobed—The uterine cavity is not closed until the ovum attains such a size as to force the decidua reflexa into close apposition with the decidua vera.—2. Missed labor—Definition—Its occurrence in domestic animals—Examples in the human subject.

1. Superfœtation.—The best definition of the term superfœtation which can be given is this, that it is *the occurrence of a new conception, while the cavity of the uterus is already occupied by an embryo.* For example,—a woman one or two months advanced in pregnancy, again becomes impregnated: she gives birth to the first child mature when it has reached the ninth month of intra-uterine growth, and the second also mature one or two months later. This is a case of superfœtation, or superimpregnation. The belief in the possibility of this occurrence is by no means universally entertained at the present day; although by many of the old writers little hesitation is felt on the subject. Thus Aristotle refers to the matter, remarking that "it happens sometimes that an abortion takes place, and ten or twelve products of superfœtation come away." Harvey cites an instance of it. In 1738, J. P. Gravel wrote a learned treatise *De Superfœtatione.* Haller in his writings gives an account of all the cases, the histories of which he has been able to collect.[1] And Brassavolus—some two centuries earlier—asserted that he had seen superfœtation *epidemic!*

Without assenting to the views of the last-named author—who possibly was the Joe Miller of his day—it seems undeniable that a few curious and well-authenticated cases have happened, which can only be explained by allowing the truth of the oc-

[1] Elementa Physiologiæ Corporis Humani. Tomus viii. Lausannæ, 1757.

casional occurrence of superfœtation. At the same time it must be remembered, that many of the examples brought forward in support of this doctrine may be explained without having recourse to it. The instances usually adduced are such as these: A woman has been delivered, at the natural termination of gestation, of a full-grown fœtus and a shrivelled ovum. Or, there has been a delivery at the same time of two children, one being more developed than the other. Or, a negress has given birth to twins of different colors, as in a case mentioned by Dr. Mosely.[1] Or, lastly, a woman has borne a mature child, and three or four months afterwards a second fully developed and healthy child. Now, with regard to the first and second class of cases, it seems certain that they may have been, and indeed usually were merely ordinary twin pregnancies; in the first instance one ovum having been blighted but retained, in the second case one fœtus having been better nourished than the other. Still this view fails to explain all the instances of the second class, as the following history—related by Dr. T. B. Taylor—seems to prove:

A negress about thirty-five years old, was delivered of twins in May, 1848; one a mulatto, the other a negro child. She had been married many years to a negro—a slave on the same plantation as herself—and had had several children by him. Her menstrual discharge had occurred for several months previous to her pregnancy at the full of the moon. She felt herself pregnant by her customary signs, about the middle of the month; and to confirm her suspicions, at the next period the menses did not appear. About three weeks from the time she first felt that she had conceived, and one week after her menses had failed to appear at the proper period, she had sexual intercourse once with a white man. At birth, the mulatto child bore marks of

[1] A negro woman brought forth two children at a birth, both of a size, one of which was a negro, the other a mulatto. On being interrogated as to the cause of their dissimilitude, she said she perfectly well knew the cause of it, which was, that a white man belonging to the estate came to her hut one morning before she was up, and she suffered his embraces almost instantly after her black husband had quitted her.—Treatise on Tropical Diseases, &c. Fourth Edition, p. 111. London, 1804.

But the most extraordinary case of monstrosity, involving the questions of superfœtation and paternity, is said to have occurred at Alexandria, in Egypt. A Fellah woman was delivered of a dicephalous monster, of which one head was *white*, and apparently about the eighth month of uterine life, while the other was *black*, possessing in other respects the negro conformation, and this head was fully developed. The monster was born dead, and the mother died soon after her delivery. The change in the color of the skin commenced at the neck of the black head, and was found, by an eminent physician, to be due to the existence of a coloring matter similar to that found in the skin of the negro race. The husband of the woman was a Fellah, whose skin was of a brownish color. There were negro laborers in the port, but it could not be ascertained whether the woman had had intercourse with any of them. It is therefore impossible to say whether this was or was not a case of impregnation about the same time by two men of different races.—L'Union Médicale. Paris, 5 Août, 1848. Quoted from Dr. Taylor's Medical Jurisprudence. Fourth Edition, p. 547. London, 1852.

being at least three weeks younger than the negro; thus corroborating the woman's opinion, as to the time between the two conditions.[1]

The third class of cases must also be explained on the supposition of a twin pregnancy; two ova having been impregnated at nearly the same time by different men. But with regard to those instances where a woman gives birth to a mature child, and three or four months afterwards to a second—the uterus not being double—no explanation but that of superfœtation can be given. Professor Eisenmann, of Strasbourg, relates the history of a woman who was delivered of a second child 140 days after the birth of the first, both having been mature: she subsequently bore many other children, and after her death the uterus was proved to be single.

Dr. Maton has recorded the case of an Italian lady who was delivered on the 12th November, 1807, of a male child, which "had every appearance of health at the time of his birth," though he lived nine days only. On the 2d February, 1808—not quite three calendar months afterwards—this lady gave birth to another male infant, completely formed and apparently in good health; and who lived for three months, when he died of measles.[2]

Dr. Tyler Smith states, that in the early part of the year 1856 he saw the following example:

> A young married lady, pregnant for the first time, miscarried at the end of the fifth month; and some hours afterwards a small clot was discharged, inclosing a perfectly fresh and healthy ovum of about one month. There were no signs of a double uterus in this case: the patient had menstruated regularly during the time she had been pregnant, and was unwell three weeks before she aborted.[3]

With regard to some of the reported cases of superfœtation there can be no doubt but that they have been so named improperly. The mistake has arisen from the uterus having been double or divided into two cornua; conception having occurred first in one division, and then in the other. Professor Kussmaul, in his excellent treatise on uterine malformation,[4] does not seem

[1] American Journal of the Medical Sciences. New Series. Vol. xvii, p. 549. Philadelphia, April, 1849.

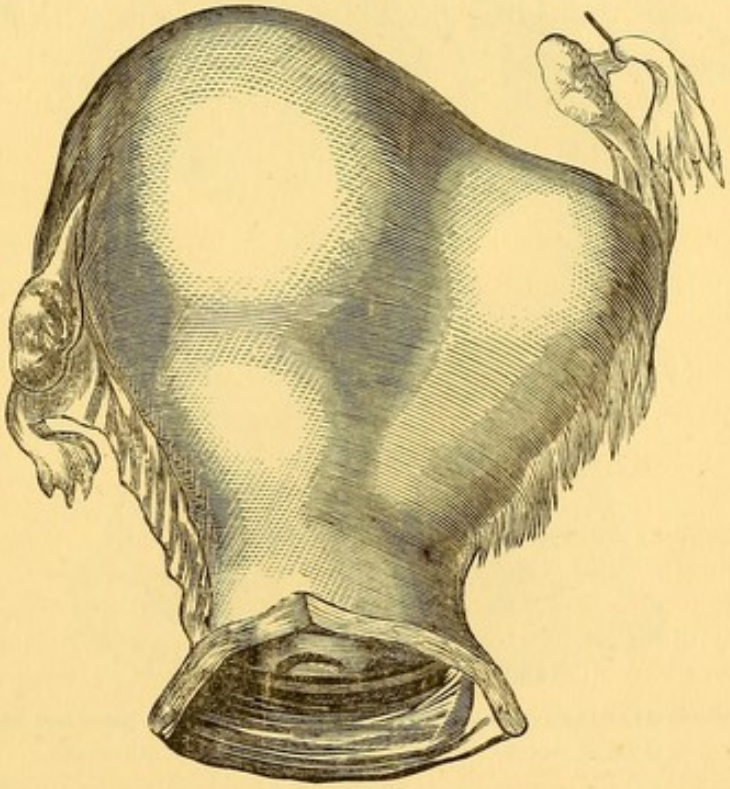
[2] Medical Transactions, published by the College of Physicians in London. Vol. iv, p. 161. London, 1813.

[3] The Lancet. London, 12th April, 1856.

[4] Von dem Mangel, der Verkümmerung und Verdopplung der Gebärmutter, von der Nachempfängniss, und der Ueberwanderung des Eies. Von Adolf Kussmaul, M.D., p. 3, &c. Würzburg, 1859.

inclined to agree with Rathke, that the uterus is formed partly out of the genital canal and partly by the fusion of the two oviducts. Such a mode of formation would account for a womb which is double at its upper part and single below; but it fails to explain the cases where the uterus and vagina are both completely bifid. Consequently, Kussmaul believes with Serres, Geoffroy St. Hilaire, and others, that the uterus and vagina and bladder are all originally bifid. In many of the lower animals the uterus is permanently double-horned. And in the human

FIG. 13.



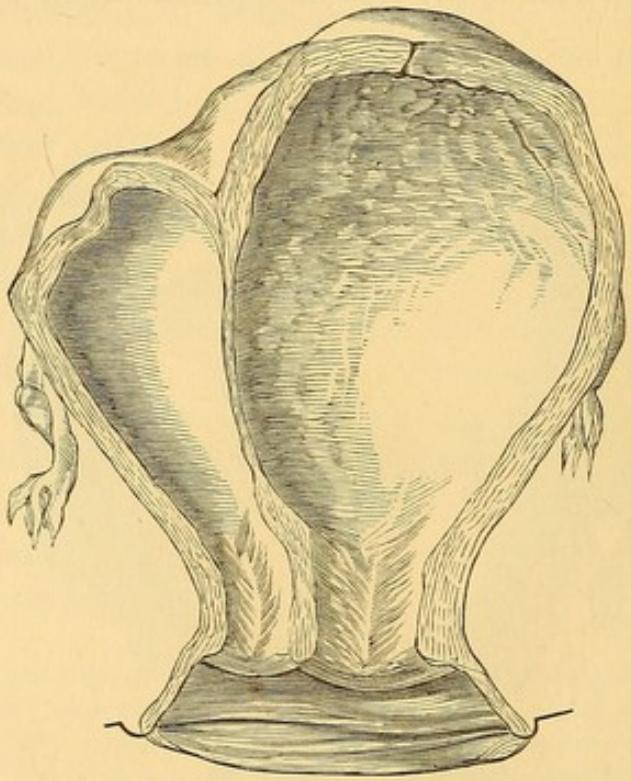
UTERUS DIVIDED BY A PARTITION AND HAVING A DOUBLE OS. THE VAGINA IS SINGLE. (After Cruveilhier.)

subject, until the beginning of the fourth month of intra-uterine life the womb is always distinctly bifid; but its dividing septum commonly disappears in the sixth month. Where, however, arrest of development occurs before this absorption of the septum takes place, the uterus remains a double organ throughout life, its cavities being separated from each other by a distinct wall.

Instead of being simply divided by a septum the uterus is occasionally more distinctly bifid. Some duplex uteri have the

separation only at the upper part; the two horns becoming fused together into one cervix, so as to present one orifice. In other instances, the two halves lie far apart above, but come into apposition below; the two cervical canals and orifices, however, remaining perfectly distinct, while the vagina is also divided. But it is worth remembering, that whatever the exact form of these uterine malformations may be, yet the essential organs of genera-

FIG. 14.



SECTION OF THE SAME UTERUS.

The drawing was made at the expiration of a pregnancy in which the fœtus had been developed in the left cavity.

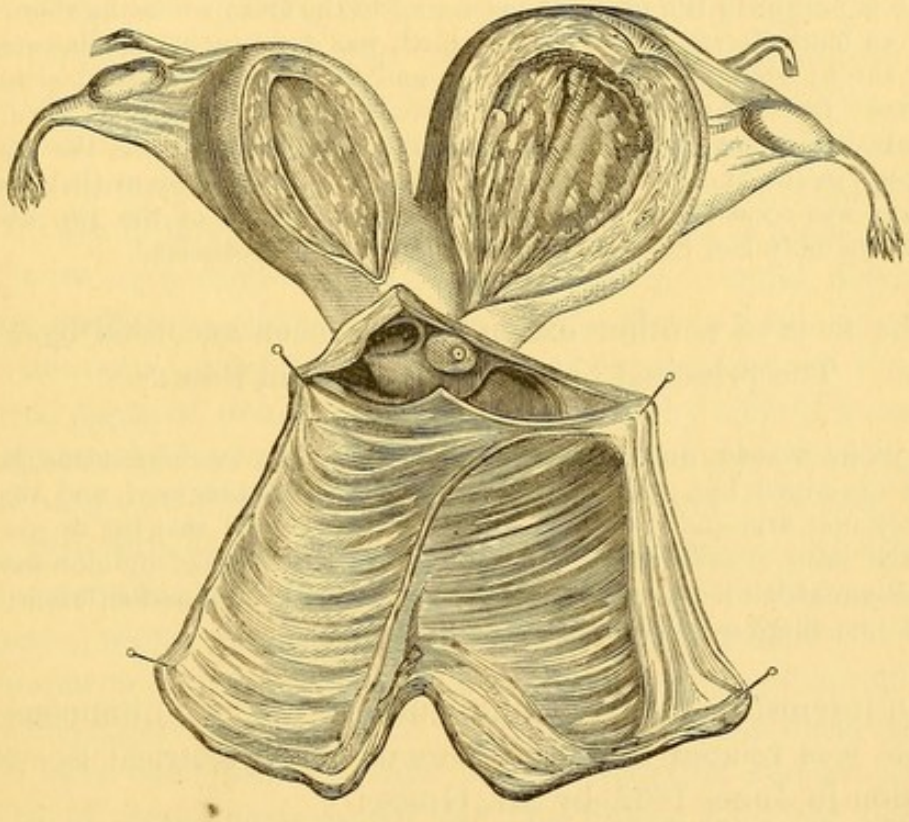
tion are found as in the normal state. In other words, though the uterus and vagina be double, the ovaries and oviducts are unaltered, either as regards position or number.

A remarkable case of impregnation of both horns, and consequent production of twins in the uterus bicornis, has been recorded by Dr. Generali, and is quoted by Dr. Alexander Henry in his excellent essay on this subject. The chief points may be thus stated:

Gaetana Bovatti, of Modena, had had six difficult instrumental labors. In 1816, she was pregnant for the seventh time; and there was noticed a well-marked furrow along the median line of the uterus, which gave rise to

the suspicion of a double pregnancy. On the 15th February, 1817, she was delivered of an apparently full-grown male child; the placenta came away naturally, but there was no lochial discharge. The abdomen was reduced in size on only one side, and fœtal movements were felt on the other. This state continued until the 14th March, when she was delivered of a second male infant of equal development with the first. In 1822, she became pregnant for the last time, and was delivered of a female infant. In September, 1847, this woman died of apoplexy. The uterus, on examination, was found to be double: the neck was of the usual form, but the body was divided into two parts, each being furnished with a Fallopian tube.[1]

Fig. 15.



BIFID OR DOUBLE-HORNED UTERUS. (After Moreau.)

The woman from whom this drawing was taken, had conceived alternately in each half of the uterus, and died after her second delivery in the Paris Maternité from metro-peritonitis. The vagina was originally divided throughout its whole length by a septum, but in consequence of rupture during delivery, there remained only a narrow band and a double cicatrix at the upper part of the canal.

Another decided case may be subjoined. It occurred in the practice of one of the pupils of the Maternité of Paris, and the history is as follows:

A woman was on the point of labor in the *fifth month* of her seventh pregnancy; a continual flow of blood, three weeks before, caused her to forebode miscarriage. The labor proceeded slowly, the head of the fœtus passed the os uteri, but could only be extracted by aid of the fingers, and the infant

[1] The London Journal of Medicine. Vol. i, p. 1105. 1849.

was born dead and livid. The umbilical cord was broken at the moment of delivery. Madame Dejean was waiting impatiently for the return of the pains and the expulsion of the placenta, when, all at once, a mass of blood, partly fluid and partly coagulated, issued forth, and brought with it an embryo, supposed to be in its *third month, manifesting signs of life*. The former fœtus was eight inches and a half in length, the latter only three and a half: the superfœtation was evident. Madame Dejean ascertained by examination, that the vagina and utero-vaginal orifice were single, as well as the cervix uteri; but that there existed two *cervico uterine orifices*, each corresponding with a distinct uterus. These two orifices were perfectly distinct and open, one on the right, the other on the left side; they were of a different size. The birth of the second infant was almost immediately followed by the expulsion of the placenta belonging to the first: while the other came away an hour afterwards. One afterbirth was four inches in diameter, the other three; both were nearly circular, and the cords were attached to their centres. It is easy to suppose that a second impregnation may have taken place two months after the first, inasmuch as the body alone of the uterus is occupied in the first half of pregnancy; and it is quite evident that the miscarriage was occasioned by the considerable distension of the two uteri, of which one only had been distended in previous pregnancies.[1]

The facts of another example have been recorded by Tiedemann. The principal points of interest run thus:

A young woman, during her labor, was visited by two physicians, both of whom examined her. One stated that she was not pregnant, and that the os tincæ was firm and closed: while the other asserted that the os was open and the head already engaged in it. This difference of opinion caused a discussion, which led to a further and more careful examination, when it was found that there were two vaginæ and a double uterus.

An interesting case of double uterus, with simultaneous gestation, was related to the Fellows of the Obstetrical Society of London in June, 1862, by Mr. Grace:

Mr Grace was summoned by his father to see a patient in labor for the fourth time Her age was twenty-six. Twice previously there had been premature birth; the third child did not live. When first seen by Mr. Grace, labor had been going on for fifteen hours; the waters had escaped. On examination, a hand was found presenting in the vagina, with the os uteri about half dilated; but lying posterior to this, another os was discovered, with the head of a child presenting. The septum between the two was half an inch thick, and extended up as far as could be reached. The anterior os was dilated, the child turned, and delivery effected. The placenta then followed. The child was dead, and apparently seven months old. The posterior os was next dilated, turning effected, and a live child extracted, which survived only a few hours. The placenta of the second child was ex-

[1] A Practical Treatise on the Diseases of the Uterus and its Appendages. By Madame Boivin and Prof. Dugès. Translated by G. O. Heming. Note, p. 20. London, 1834.

pelled without difficulty. Both children were females equal in development. No flooding or other complication interfered with the perfect recovery of the patient.[1]

The question still remains to be answered,—Is there any positive physical obstacle to the occurrence of superfœtation where the uterus is not double or bilobed? It seems certain that there is not; or, at all events, not until after the termination of the third month of pregnancy. The opposite view has chiefly been maintained by those who assert that ovulation never occurs during pregnancy, who believe that the os uteri gets plugged directly after impregnation, and who have also been unacquainted with the true structure of the decidua. That ovulation during pregnancy is an exceptional circumstance—notwithstanding Scanzoni believes its occurrence to be the law—is extremely probable; but this is very different to saying that it never takes place. As a rule, a woman does not experience any menstrual discharge during gestation; yet no one denies that this is a rule to which there are many exceptions. And as we sometimes see that the external signs of ovulation are manifested, why should we argue that those which are naturally unseen are absent? With regard to the supposed obstruction of the cervical canal it is now, I believe, generally accepted as proved that the mucous plug of pregnancy is similar to the mucus found in the cervix in the unimpregnated non-menstruating uterus; through which plug the active spermatozoa must make their way in ordinary fecundation, and which therefore can be no obstacle. Then, the observations which have been already made on the structure and growth of the gravid uterus have shown that the uterus does not become closed until the ovum attains such a size as to force the decidua reflexa into close and firm apposition with the decidua vera; so that until this happens—about the third month—there is a sufficiently free communication between the ovary and the vagina, or in other words between the ovules and the semen. As Dr. J. Matthews Duncan remarks, this explanation will account for all the authentic cases of superfœtation.[2] For if we suppose in an instance of this kind, that the first child is born prematurely, but within the limits of viability, we thus gain two months; and

[1] Transactions of the Obstetrical Society of London. Vol. iv, p. 138. London, 1863.
[2] Monthly Journal of Medical Sciences. Vol. xvi, p. 331. Edinburgh, 1853.

if impregnation may take place between two and three months after conception, we have thus four or five months of interval accounted for between the births of successive viable infants.

As illustrating the application of the foregoing remarks, attention may be directed to the following case:

In 1862, Dr. George Harley and the author were requested to draw up a report on a preparation of supposed twin abortion which had been exhibited to the Obstetrical Society by Dr. Langmore. The patient's history was this: Mrs. B—, aged 38, has had nine children, the youngest being three years old. Has never had twins. The catamenia were on for the last time in January, 1862, and they ceased on the 20th. On the 22d May, when she was probably about four months advanced in pregnancy, she noticed a slight vaginal discharge; a fortnight previously having had shivering and a continued feeling of coldness in the abdomen. In the evening pains came on, and a fœtus, apparently of about four months' gestation, was expelled. It was flattened, and more or less atrophied; and on examination immediately afterwards, it was apparent that it had been *dead some time*. Serious hemorrhage set in, and therefore Dr. Langmore, who, up to this time had been in charge of the case, summoned Dr. Priestley for consultation. This gentleman removed the placenta, which corresponded in size with the fœtus expelled. As the flooding was not checked by this proceeding, Dr. Priestley again introduced his finger into the uterus; when, by depressing the organ with the hand applied over the pubes, he reached a smooth and soft body, which was adherent to the upper part of the cavity, but was removed without much difficulty. On withdrawing this body it was found to consist of a second bag of membranes. The chorion and amnion were unruptured, healthy, and transparent; and through them an embryo of about five or six weeks could be plainly seen, floating in clear liquor amnii. The embryo appeared fresh and perfect, not at all atrophied, and minute vessels could be distinguished ramifying on its dorsal surface. There was a little fresh blood-clot, adherent here and there to the villi of the chorion; and as this was not removed before putting the preparation into spirit, it became hardened and incorporated with the villi. There were, however, none of the appearances of ordinary apoplectic ovum. The decidua of this second ovum came away separately, and was healthy; there was no indurations in its substance, but here and there it was infiltrated with fresh blood.

When the preparation came into the possession of Dr. Harley and the author it had been in spirit for thirteen days. The first fœtus was of about the fourth month of utero-gestation. It was a male, the penis and scrotum being distinct; it measured five and a half inches in length from the occiput to the heel. The eyelids were separable. Mouth, lips, and tongue, perfectly distinct. The ears were tolerably advanced in formation, the meatus being distinct. The nails were already defined. The placenta was pale and exsanguine in some portions, in others dark and filled with clotted blood. The membranes and cord were distinct. The cause of death appeared to have been strangulation from twisting of the cord.

In the second preparation the membranes were found unruptured, but opaque; and through them an ovum could be indistinctly seen floating in liquor amnii. A portion of the chorion villi was imbedded in blood-clot, but this could be separated, where it was attempted, in one small portion only.

The whole seemed healthy, allowing for the changes produced by the spirit. The sac of the membranes measured two and one-eighth inches. On opening the bag a small embryo, in a good state of preservation, was discovered. It measured five-eighths of an inch in length and five-sixteenths in breadth. The head, with the eye, was perfectly distinct. So, also, were the branchial clefts. The legs and arms already projected from the trunk. The interior of the sac was at one spot unusually vascular.

After a careful examination of the preparation, the examiners came to the conclusion that it was in all probability an example of superfœtation. And they say that they did so for this reason: "If the second, healthy, six weeks' ovum were the product of the same conception as the first four months' fœtus, which had been *dead some time* when expelled, then we must believe that although the latter perished some days before its expulsion, and manifested symptoms of putrefaction, yet the small, second ovum died when six weeks old, was retained for about ten weeks afterwards, and, nevertheless, when removed, was perfectly healthy, and did not present any trace of decomposition. We cannot subscribe to this improbable view. As, theoretically, we see no physical obstacle to the occurrence of superfœtation, during the first three months of pregnancy, so we think the specimen now reported upon proves, so far as anything of the sort can prove, that superfœtation is a positive fact."[1]

I would only remark, in conclusion, that although it is important there should be a general recognition of the truth of the doctrine of superfœtation, yet it is equally necessary for the physician to avoid being over-credulous. Without doubt, superfœtation is of rare occurrence, the genuine recorded cases of it being few. But because, in medical literature, many true and false narratives are mixed up together, we are not justified in rejecting the whole. The labor of sifting the grains of wheat from the bushel of chaff may be great; but, unlike Gratiano's reasons, they are worth the search.

2. Missed Labor.—More uncommon and extraordinary, perhaps, than either extra-uterine pregnancy or superfœtation, is the abnormal condition now to be mentioned. When, from some cause which has not hitherto been explained, the pains of parturition do not come on efficiently at the proper period, but the mature fœtus dies and remains included in the uterine cavity, without directly destroying the mother, we have an example of what is termed *missed labor*. This curious phenomenon is of very rare occurrence in the human subject; although it may be conjectured that Celsus is alluding to it in the twenty-ninth chapter of his seventh book, where directions are given for extracting

[1] Transactions of the Obstetrical Society of London. Vol. iv, p. 165. London, 1863.

the fœtus when it has died in the uterus and cannot be born spontaneously. Whether this conjecture be well founded or not, however, I am only acquainted with the records of some twenty, or four and twenty indubitable examples of this remarkable casualty in woman;[1] but it seems to be much more frequently met with in cows, mares, and other domestic animals. In the Museum of the Royal College of Surgeons of England, there are several preparations illustrating this condition. Amongst others there is the os uteri of a cow, whose uterus had contained twin calves (almost fully developed) for nearly two years; and another dissection showing a portion of the horn of the uterus of a sheep, containing a part of the lamb which had been retained in the uterus beyond the ordinary period of gestation, and which had become adherent to the surrounding uterine wall.

Judging from the examples which have been published of missed labor in the human subject, it would appear that the uterus either remains perfectly passive at the completion of the full term of gestation, or inefficient pains come on for a time and then cease altogether; while any attempts which may be made to excite contractions by ergot, galvanism, artificial dilatation of the os uteri, &c., seem to fail. The womb indeed becomes a

[1] In addition to some examples to be presently mentioned, the reader may be referred to the following: Morgagni alludes to one case from Nebelius, in his work De Sedibus et Causis Morborum: Epistola xlviii, art. 41. Edit. 2nda, Tomus 2ndus, p. 209. Patavii, 1765.—In Lowthorp's Abridgment of the Philosophical Transactions, Fifth Edition, vol. iii, p. 223, London, 1749, is a case where some of the tissues of the fœtus were voided by the anus years after conception. So many bones, indeed, came away that "everybody thought that there must have been three fœtuses buried in the womb all that time."—Dr. Dan. Schulz reports the case of a fœtus retained in the uterus for nine years. The history is to be found in the Commentarii de Rebus in Scientia Naturali et Medicina Gestis, vol. xvi. p. 399. Lipsiæ, 1770.—Gahn has collected the histories of many strange cases in his dissertation De Partu Serotino, pp. 12 to 16. Upsaliæ, 1770. Many of the supposed examples of missed labor, however, are really instances of extra-uterine pregnancy.—Voigtel speaks of an embryo remaining forty years in the womb, in his Handbuch der Pathologischen Anatomie. Band iii, p. 518. Halle, 1805.—In Schmidt's Jahrbucher, 9th November, 1848, Dr. Vondorfer relates the case of a woman, forty-nine years old, with whom the pains of labor came on, and ceased after continuing for some days. At the end of eleven years the patient died from symptoms of purulent infection; and at the autopsy the remains of the putrefied fœtus, with its numerous bones, were found in the uterus.—Dr Rae Menzies records an instance in the Glasgow Medical Journal, vol. i, p. 129, 1853.—Dr. Montgomery met with one instance, which he has narrated in the second edition of his classical work on The Signs of Pregnancy, p. 589. London, 1856.—Dr. McClintock reports a case of his own, with the notes of others communicated to him, in the Dublin Quarterly Journal of Medical Science, vol. xxxvii, pp. 51 and 307. Dublin, 1864.—Sir James Simpson and Dr Keiller each related a case to the Obstetrical Society of Edinburgh, on the 12th July, 1865, the particulars of which are given in the Edinburgh Medical Journal, pp. 575, 576. December, 1865.—And lastly, Dr. Halley described a case at the Obstetrical Society of London, on 5th June, 1867, a report of which appears in the Lancet, p. 72. 20th July, 1867.

mere sac, like the cyst formed around an extra-uterine fœtus; and its walls may ulcerate so as to permit of the passage of the decomposed fœtal bones and tissues into the peritoneal cavity, or into the bladder, or into the bowel. Meanwhile, however, the woman's health suffers greatly. The horribly offensive putrid discharge, which follows upon the decomposition of the fœtus, always sets up severe constitutional disturbance; while the patient is fortunate if ichorhæmia, or metritis, or peritonitis can be warded off.

Dr. Oldham has met with one case which deserves to be known, inasmuch as prior to its occurrence very little attention had been devoted to the subject in this country:

The subject of this history was a pregnant woman aged forty-one, who expected to be confined in June, 1845; at which time a gush of blood from the uterus took place, with some pain, but without any other sign of labor. The breasts became distended with milk. Ergot of rye, galvanism, and some attempts at artificial dilatation were in vain had recourse to, in order to excite the paralyzed uterus. The fœtus decomposed, and a great many of its bones were removed through the os uteri. The patient died three months after she had missed her labor. A preparation of the uterus was shown at one of the meetings of the Pathological Society. By this specimen it was seen that the uterus was contracted, and the anterior wall of its body almost entirely absorbed. The remainder of the fœtal bones, closely packed into an ovoid mass, were found in a cyst; which was bounded in front by the abdominal walls and urinary bladder; above, by omentum and small intestine, held together by false membrane; and behind and below by the posterior wall of the uterus, the cervix, and the os. The bladder was also thinning at one part, as though some of the fœtal bones would have soon passed through it.[1]

A more extraordinary instance occurred some years ago in Occoquan, Virginia, and has been reported by Dr. M. L. Weems:

A mulatto, about twenty-five years old, the mother of three or four children, having completed the ninth month of her pregnancy, was taken in labor in the spring of 1827. Severe pains continued for two or three days, and then ceased; leaving her undelivered. From this time she continued, regularly, about every four weeks, to experience a return of the pains; which would generally last for two days, and then leave her as before. This state of things continued until June, 1828, when an empiric determined to open the uterus by an incision through the abdomen. On performing this operation, the uterus was found to contain the remains of a fœtus in a half dissolved state, many of its bones being detached and bare: a large proportion of the soft parts had previously putrefied, and come away by the vagina. On removing the remains of the fœtus, the internal surface of the uterus, for several inches

[1] Proceedings of the Pathological Society. Vol. i, p. 130. London, 1846. Also the Guy's Hospital Reports. Second Series. Vol. v, p. 105. London, 1847.

around the os uteri, was found lined by a crust of osseous matter, which formed a smooth and perfectly continuous surface, except at the os uteri, where there was an opening sufficiently large to admit the finger. The crust was about half a line thick, possessed considerable strength, and adhered firmly to the uterus; from which it was with difficulty removed in small flakes. The uterus showed no disposition to contract; but the woman did well for ten days, when—after an error in diet—she was seized with peritonitis and died. No post-mortem examination was made.[1]

The foregoing case is particularly interesting; for though Morgagni, Baillie, and others, have related instances in which the substance of the unimpregnated uterus has been converted into bone, yet I know of only one other example of such a change occurring during gestation. This instance is recorded by Dr. John Caldwell,[2] and is remarkable because not only was the greater part of the uterus ossified, but the fœtus itself had also undergone the same change. It is true that Dr. R. B. Cheston[3] has given the history of a curious case in which the fœtus was retained in the mother's abdomen, inclosed in an osseous sac, for fifty-two years after the expiration of the usual period of gestation; but it seems probable that in this instance the uterus ruptured during labor, and that the bony covering was subsequently formed around the child as it lay in the abdominal cavity.

With regard to the cause of missed labor we know nothing. I have a theory, that in some cases at least it may be due to the umbilical cord being twisted twice or thrice round the child's neck. Let the cord be coiled only once round this part, and it is astonishing how inefficient the pains of labor are rendered. As to treatment also, but little can be said. Such remedies as hip baths, vaginal injections of the solution of permanganate of potash, rest, and nourishing food are obviously indicated. If symptoms of blood-poisoning set in, the effects of the sulphite of magnesia should be tried. Where any of the fœtal bones can be felt presenting at the mouth of the uterus, they ought to be carefully extracted. And lastly, under favorable circumstances it is certainly justifiable to dilate the os uteri with sponge tents, and then to remove as many of the bones, &c., as can be got at, without the employment of undue force.

[1] The American Journal of the Medical Sciences. Vol. xviii, p 257. Philadelphia, 1836.

[2] The Edinburgh Medical and Surgical Journal. Vol. ii, p. 22. Edinburgh, 1806.

[3] Medico-Chirurgical Transactions. Vol. v, p. 104. London, 1814.—The preparation (No. 2720) is in the pathological department of the Museum of the Royal College of Surgeons of England.

CHAPTER IX.

THE DISEASES WHICH MAY COEXIST WITH PREGNANCY, AND THEIR RECIPROCAL INFLUENCE.

1. The state of pregnancy not always a happy one—The fears of the recently married girl—The anxieties of the poor.—2. The influence of mental disorders—Melancholia the most frequent form—The consequences of pregnancy occurring in a woman already insane.—3. Paralytic affections do not hinder conception—Disease of the brain has no effect on the progress of labor—The amount of influence which the three nervous centres exert upon the uterus during parturition.—4. Pregnancy seldom of benefit to epileptics.—5. Chorea in connection with pregnancy.—6. The necessity for caution in recommending marriage for young hysterical women—The influence of hysteria on pregnancy and delivery.—7. The occurrence of tetanus after abortion.—8. The effect of pregnancy on the progress of phthisis—The effect of pulmonary consumption in hindering conception.—9. The effect of pneumonia on the course of gestation—The fatality of this disease to pregnant women.—10. The heart normally in a state of hypertrophy during pregnancy—Sympathetic or nervous throbbings of the aorta.—11. Carcinoma of the labia and cervix uteri.—12. The treatment of syphilis during pregnancy.—13. The epidemic and infectious maladies which may complicate pregnancy.—14. General observations on the therapeutics of pregnancy—The influence of bloodletting—Cathartics and purgatives—Diaphoretics—Narcotics and sedatives—Counter-irritation—Tonics and stimulants, etc.

1. The state of pregnancy though a happy one for the great majority of women, is not so for all. In the delicate and recently married girl, the general constitutional uneasiness which this condition induces, together with the novelty of her position, tends not a little to foster and increase the vague fears which are naturally entertained as to the pains and perils of parturition; fears, which have not unfrequently been seen to embitter almost the whole period of gestation. So also, the prudent mother maintaining a family on limited means experiences no small amount of solicitude as to the manner in which another child is to be provided for; this inquietude perhaps attaining an importance with which those only can thoroughly sympathize who know what it is to feel the *res angusta domi*. And then—not to mention the unmarried girl, whose pregnancy only serves

to reveal her dishonor—there are those who, having grown-up sons and daughters, and having been unfruitful for some few years, become unexpectedly pregnant just perhaps as they were looking for "the change of life;" and who, strange to say, really feel greatly ashamed of their condition. If, after a time, the sentiment of humiliation be conquered and allowed to pass away, it is often only that it may be replaced by an exaggerated remembrance of past suffering, and a firm conviction that the trial which awaits them will end fatally; or perhaps the melancholy feeling takes the form of a fixed and ever-present idea, that the offspring will be malformed and hideous. Suppose, that to these mental disturbances there be superadded physical suffering—*e. g.*, that arising from some form of dyspepsia. Surely, the effect upon the patient's constitution can be pictured without much difficulty. Indeed, under these circumstances, sensitive ladies have sometimes so foolishly tortured themselves, that at the termination of their condition by parturition, their protracted vexation and pain has culminated in an attack of puerperal mania. If it be allowed, as it fortunately can be, that matters very seldom proceed to this extremity, yet it is undeniable that they very generally place the pregnant woman in a most unfavorable position for withstanding the ill effects of any morbid processes to which her system may become exposed; and that they always modify these processes in a marked degree.

2. Granting that these remarks are correct, it will excite no astonishment to find that *mental disorders*, either slight or grave, not very uncommonly demand the cautious attention of the physician during the progress of gestation. This is especially the case with women who have any predisposition to insanity; such individuals being particularly susceptible to its attacks, either during pregnancy or immediately after delivery. In mild cases, the disease merely impresses a peculiar character on the patient's actions and physiognomy, without depriving her of the power of self-control; whereas in the more severe instances there are the ordinary well-marked symptoms of an established disordered intellect. It should be remembered, however, that the difference between these two classes is usually only one of degree; the affection being the same in both.

Multiparæ and women beyond the age of twenty-five are

probably more liable to attacks of insanity during pregnancy than primiparous young females. An hereditary tendency, former attacks of mental alienation, constitutional weakness, excessive irritability of the uterine organs, prolonged mental excitement, and sudden fright, are among the chief predisposing causes. Although the reason for its being so cannot be satisfactorily defined, yet there is little doubt but that this distressing malady is more common in France than in Great Britain; while in both countries, the cases of insanity arising *during* pregnancy are much smaller in number than those which occur *after* delivery. Single women seem to suffer more frequently than the married; shame, neglect of friends, and perhaps the cruelty of the seducer being no sedatives to nervous irritability and excitement. It does not follow because a woman is attacked with temporary insanity during one pregnancy, that she will therefore necessarily suffer in the same way in another; but there is certainly a fear that she may do so. Dr. Burrows, in his *Commentaries on Insanity*, asserts that in some women insanity occurs contemporaneously with conception, and returns with every impregnation. Some become insane at various periods of gestation; others at the time of quickening only. The character of the derangement during pregnancy is almost always that of genuine insanity, not the delirium of the puerperal state. The same strange and inexplicable anomalies have, it is reported, been once in a way observed in the insanity of pregnancy, as have been found to occur in the mania which follows delivery. Thus, it has been asserted that women who have lost their reason for a time when carrying male children, have continued quite healthy when pregnant with females. Now although I cannot believe for one moment that these circumstances have stood at all in the relation of cause and effect, yet there are not wanting authorities who appear to think that there has been something more than mere accident in the sequence of events. Even Esquirol has said, that some females have puerperal mania after giving birth to a male infant, whereas they have remained exempt from this malady after confinement with a daughter. So also in other instances, delirium has manifested itself only after every second labor. And again, in a third class, the disease has set in during the third or fifth month of each period of lactation without any discoverable exciting cause. Possibly,

however, the process of suckling has induced a condition of cerebral anæmia, the women being originally of weak and irritable constitutions.

Of the various forms of insanity, melancholia is that which most frequently afflicts the pregnant woman. The symptoms are in no way modified by the condition of the generative organs; and hence they need not be described in these pages. The diagnosis between extreme mental dejection and true melancholia is often sufficiently difficult to test the sagacity of the physician. One simple mode of distinguishing between the two, which merits attention, has been pointed out by Dr. L. V. Marcé,[1] and it is this: That the tendency to despondency, and all the resulting modifications of character and intelligence which are met with at the commencement of pregnancy, become less and less marked after the third month of gestation, and especially as the time of labor draws nigh; whereas in examples of mental derangement exactly the reverse occurs. Thus, putting aside those cases where conception seems to give, as it were, the signal for intellectual derangement, it is found that insanity seldom begins till the third month has passed, and commonly does not do so till after the sixth; while in general, moreover, the patient does not in any way improve during the continuance of gestation.

Remotely allied to these cases of monomania are those *longings* of pregnant women which sometimes lead to the commission of crime. The delusions of this nature can generally be conquered; and no doubt as a rule, they are overcome. But every now and then the public is startled by finding some lady of position accused of shoplifting, and whose only excuse is that she is irresponsible on account of her pregnancy. This plea must always be received with great caution. It is impossible to lay down any general rules on the subject. Every case must be thoroughly inquired into, without any regard to the social position of the accused. It should be remembered, however, that the question to be solved is generally this: Has the theft been so contrived and so attempted to be concealed, and has the stolen property been so used or disposed of, as to show that the accused is a responsible agent or not? There may be no dispute as to her having urgent longings. The point is,—could she not resist

[1] Traité de la Folie des Femmes Enceintes, des Nouvelles Accouchées, et des Nourrices, p. 42. Paris, 1858.

them? For it can never be allowed that the moral or legal obligation of a woman to withstand temptation is removed by pregnancy.

Where insanity comes on during gestation without any special cause, and when there is no strong hereditary predisposition or powerful moral influence to maintain the diseased action, amelioration of all the symptoms very often occurs spontaneously a few days, or even hours, after delivery; this amendment being followed by complete recovery within a variable period of time. Why, in one instance, parturition should cure mental derangement, whereas in another it may appear as the cause of acute mania, is a problem difficult to solve. The fact, however, being as stated, it follows that during the attack active medical treatment ought not to be resorted to. The physician should content himself with seeing that the functions of the bowels, liver, kidneys, skin, &c., are properly performed; that the patient takes a due amount of nourishment, without overtaxing her digestive organs; and that she has quiet sleep at night. Tonics, gentle aperients, sedatives, and narcotics, with moderate daily exercise in the open air, are all useful agents. In many instances, removal from home and the influence of relatives is required; exceptionally, the reverse has to be recommended, the presence and conversation of judicious friends proving beneficial. One point must, however, be specially remembered, or the most frightful consequences may ensue; viz., that inasmuch as the morbid state almost always gives rise to the greatest irritability and despondency during the whole progress of the disease, so these afflicted patients require constant care to prevent them from attempting self-destruction. They would appear, moreover, to be peculiarly liable to become affected with sudden uncontrollable impulses to commit suicide; in this respect differing from the majority of melancholics, who generally destroy themselves, or try to do so, after long and careful premeditation, and after displaying the greatest cunning in their preparations for eluding suspicion. After delivery has safely taken place, the infant should on no account be left alone in the mother's charge, until it is quite certain that a favorable and permanent change has taken place; though it is quite proper at short intervals and under surveillance to trust her with the child—not to suckle it, save in a few special cases—in order to try and arouse a new and healthy train

of feelings. The expression "permanent change" is used advisedly, for the disease sometimes recurs. As a case in point it may be mentioned, that in 1841 a woman was discharged from St. Luke's Hospital apparently cured; but experiencing a fright soon afterwards, the mind again became affected, and in one of the paroxysms she destroyed both her infant and herself. And then, supposing the patient to be so fortunate as to be cured, she should be carefully forewarned of the risk—even if it be but small—of another pregnancy; for it may not unreasonably be anticipated that the cause recurring, the effect will follow.

In certain instances it unfortunately happens that delivery, instead of exerting a beneficial influence on the progress of the insanity, seems rather to aggravate the symptoms. Thus, a woman was admitted into the private asylum at Bethnal Green, who had been attacked with melancholia immediately after quickening. She had a strong desire to destroy herself and her three children. The disease continued unrelieved during the remaining term of pregnancy; and became much worse after delivery. In a second example, at the same institution, the cerebral affection manifested itself in strangeness of conduct a month before parturition; perfect incoherence and great depression persisting after this event. Yet cases of this class are not always to be regarded as hopeless; for cures have sometimes been effected after the lapse of several months. But they teach us the important fact, that in no case of mania combined with pregnancy is it advisable to prematurely terminate the latter in order to relieve the former. It has happened more than once that when insanity has occurred during the state of gestation, abortion has been induced as a means of cure; and, as far as I can learn, the results have been most deplorable. On the contrary, by adopting a simple expectant mode of treatment the lives of both mother and infant will be unendangered; while hopes may be entertained that the mental powers of the patient will be ultimately restored.

So far we have been considering the influence of pregnancy as an exciting cause of mental derangement; but another proposition may likewise be discussed with some advantage. What, then, are the consequences which flow from pregnancy occurring in a woman already insane? Does it lead to the cure or aggravation of the mental disorder? If we seek for replies to these questions in the writings of those physicians who have given

especial attention to the subject of lunacy, we shall obtain only directly contrary opinions. Thus, guided by the results which have followed in only a few cases, we find some writers confirming the vulgar opinion that pregnancy cures insanity. But the practitioners who have had the largest experience—men who have not only seen but who have observed, and whose remarks are universally received with the greatest respect—take a much more cautious view of this question. For example, Esquirol, in recapitulating the facts taught him by unwearied and careful observation, says—"Pregnancy, parturition, and lactation are means by which Nature has sometimes cured insanity; but I regard these cures as rare. I have often seen pregnancy and labor effect no change in the demented, with the exception of rendering them more calm. I have also known a lady, who, during five consecutive pregnancies, became deranged, and was cured each time by the accouchement. But in spite of this example and of many others often quoted, and notwithstanding the opinions of many physicians, I regard as exceptional cases the cures of insanity by marriage, pregnancy, and parturition; so often have I seen the madness persist in spite of, and even be aggravated by, these means. It is only necessary to visit the Salpêtrière to see more than a hundred insane women, though they each have gone through the process of marriage, pregnancy, and delivery."[1]

More recent authors, especially Marcé and Morel, entertain similar views; and it seems to me, that reasoning from relevant facts, the opinion of these authorities must be regarded as correct. We have seen how very impressible the nervous system is rendered in most pregnant women, how the disposition often becomes altered, how the sympathetic disorders which are almost a part of the state of gestation depress the vital powers, and what a shock the pains of labor with the hemorrhage which accompanies delivery may inflict upon the whole system. Are we warranted, then, in inferring that these actions can impress a salutary change on a pre-existing morbid state? I believe not; but rather, on the contrary, that as a general rule, which the exceptions serve to prove, they are calculated to aggravate the mental disorder. Facts alone, however, can satisfactorily decide this question, and

[1] Des Maladies Mentales, sous les rapports Médical, Hygiénique, et Médico-légal. Tome ii, p. 392. Paris, 1838.

to them appeal is made. From hospital practice or from the writings of different authors, Dr. Marcé has collected the histories of nineteen cases of pregnancy occurring in insane women.[1] The great importance of the question under consideration justifies a brief analysis of these:

In one case, a woman thirty-two years of age was safely delivered at the end of her first pregnancy. After her second labor she was attacked with mania, which continued one month. Three weeks before her third accouchement, she again became insane, and has since remained so. A fourth pregnancy with a labor remarkable for a complete absence of any suffering did not ameliorate her condition.

The second patient was thirty-five years old, and had two attacks of insanity in two years; the first arising without any appreciable cause, the second at the end of a confinement. She seems to have got well, but two years subsequently (in 1832) the disease reappeared in the form of melancholia with stupor; being occasioned by the fear of cholera. While so afflicted she became pregnant. Gestation, delivery, and lactation for two months only aggravated the disease. At the end of two years some symptoms of dementia had shown themselves, when a new pregnancy occurred, followed by delivery at the full term. The dementia became more marked, and the patient remained incurable at Charenton.

In a third case pregnancy and labor occurred during a third attack of mania. The woman, twenty-five years old, became demented without any remission in the progress of the disease.

In a fourth instance, a young woman became pregnant while in the Salpêtrière, suffering from attacks of stupor alternately with excitement. She was delivered during a period of stupor after a labor of six hours; the pains having been so slight that she scarcely uttered a cry even during the last quarter of an hour. The mental disease was in no way modified.

The fifth example is curious from the fact that the patient became insane when she was nineteen years of age, and that in spite of her malady continuing she was married at twenty-one. She had three children without her condition being improved; and she was an inmate of the Salpêtrière at the time the report was written.

The age of the sixth patient was thirty-nine. She suffered from partial delirium with hallucinations; and in no way improved after pregnancy and a natural labor. The seventh case was of a similar description.

Then there are five examples which can only be alluded to briefly, since the facts are not reported in detail. One was delivered in the asylum of St. Jacques of Nantes, without her mental disease being at all modified: two were in the Salpêtrière under the care of M. Mitivié at the time of the report, one being twenty-eight years of age, the other thirty-five, and both incurable, though they were delivered in the hospital some years ago: in one case pregnancy occurred after the persistence of hallucinations for two years, but no improvement followed the birth of a fine healthy boy: and the fifth patient was under the care of M. Morel, who states that the morbid condition of the mind was modified neither by the state of pregnancy nor by parturition.

[1] Traité de la Folie des Femmes Enceintes, &c., pp. 81 to 119. Paris, 1858.

And finally, there are five instances in which a cure took place at a longer or shorter interval after delivery. There is one in which there was such considerable amelioration of the symptoms at the end of the third month of pregnancy, that she was then discharged from the asylum, and unfortunately lost sight of. And there is another recorded by M. Weill, in which reason was regained during two successive pregnancies, though the patient afterwards became an incurable lunatic.

The foregoing review cannot, it seems to me, do otherwise than lead us to agree with Dr. Marcé in opposing the practice of those who advise pregnancy in the cases of insane women, when ordinary remedies fail to effect any good. It is the more necessary to be positive upon this point, because popular prejudice is in favor of the view that pregnancy is not only a cure for insanity, but for all chronic nervous disorders; and the physician, without taking the initiative, may nevertheless by his silence be thought to authorize the practice which flows from the prevalence of this opinion. The error has arisen through the circumstance daily taught by common experience, that women who marry and by childbearing carry out the law of Nature, usually enjoy better and more even health than such as lead a life of celibacy, or who marry and remain unfruitful. But because marriage unquestionably serves to maintain the balance of physical and mental vigor, it by no means follows that it will equally avail to cure or even mitigate disease. While writing these remarks I have in my recollection the case of a young ladyof fortune, who was of such an excitable disposition, and suffered so frequently from attacks of aggravated hysteria, that at times she positively required control. After consulting for nervous disorders of one kind or another almost every medical man of note in the metropolis, her relations were strongly advised to try the effect of matrimony. Money, it is usually allowed, can procure everything; and in this instance it certainly enabled its possessor to secure a husband. After the marriage ceremony "the happy pair" lived together for nearly two years, when "incompatibility of temper" necessitated a separation. The lady was the mother of one child, which she seemed to dislike the sight of, and which was cruelly neglected; and she was five or six months advanced in pregnancy with a second infant when I saw her. Though unfit for any decent society, liable to attacks of irritability and despondency sad to witness, and in such a state generally that no one would say she was of sound mind, yet she could scarcely be called insane in the

ordinary acceptation of the term. Still it seemed to me certain at the time, that by whatever expression her condition was then designated, confirmed dementia could be the only ultimate result. Again, some time in the year 1859, I attended a case in consultation with Mr. Francis Odling, where there was a history somewhat similar to the foregoing as respects disease and marriage and separation; though happily the symptoms were less severe, the offspring was better cared for, and there appeared a probability of a more favorable termination. But the point I wish to insist upon is, that in neither of these examples did marriage do aught but aggravate the morbid symptoms; while it materially increased the difficulty of managing the patients in a social point of view, and subjected the poor little helpless children to unnatural neglect in infancy, with the miserable prospect of inheriting the mental weakness of the parents.

When fecundation takes place in insane women, the period of gestation is generally passed through in a quiet manner, and is not marked by any special peculiarities. In only two of the cases which have been referred to did the act of quickening give rise to any fresh delusions. One of the patients declared that she had a tapeworm in her stomach, whose movements she felt; while the other woman believed that there was a serpent in her abdomen, which at the time of her delivery would spring upon the surrounding persons and destroy them. The histories of these and similar cases also show that the labors of insane women are, generally speaking, remarkably easy; the pain and suffering being so slight that no indication of uneasiness even may be given. This circumstance makes it necessary that such women should be narrowly watched as the time of delivery draws nigh; since otherwise the lives of both mother and infant may be sacrificed for want of due attention. Again, too, let me urge that the suicidal and homicidal tendencies of the parent be not forgotten. The woman is often impelled by an almost irresistible desire to destroy both herself and child. And though she may for a time be able to withstand this influence, yet unless closely watched day and night, her power of resistance will fail her at some opportune moment; and then the loss of two lives will be the penalty for the neglect of the attendants.

3. The *paralytic affections* dependent upon disease of the brain

and medulla oblongata need not act so as to prevent pregnancy. I have myself seen two instances of long standing hemiplegia, in which utero-gestation for a time proceeded as under ordinary circumstances; and it may be believed that such cases are far from uncommon. Hemiplegia, involving the face and tongue and extremities, is the ordinary form of cerebral paralysis; the disease rarely assuming the condition of paraplegia, which depends, as a rule, on some injury of the spinal cord or its membranes. When paraplegia arises during the latter months of gestation, the paralysis may be due to the pressure of the gravid uterus upon the obturator nerve and the sacral plexus.

The fact is well known that paralysis is sometimes a functional disorder; or, in other words, no organic change exists in any of the nervous structures which can be recognized. Intemperance, cold, excessive venery, &c., seem occasionally to produce this form; and very rarely it is probable that pregnancy has a similar effect. At all events we know, that during the term of utero-gestation, particularly if it be complicated with albuminuria, it is not very uncommon to find patients affected with amaurosis, or with deafness: which conditions persist only until after delivery. A few remarkable instances are recorded in which more marked paralysis arises. Thus, Dr. Lever mentions the case of a lady who was attacked with hemiplegia in four successive pregnancies. The symptoms always came on very soon after the commencement of gestation; they were modified by treatment, but not removed; and were only cured by delivery.—About the year 1857, I was consulted by a lady whose lower extremities became gradually paralyzed rather before the sixth month of gestation; so that when seen one month afterwards she could neither stand nor walk, and was exceedingly debilitated. Medicines and nourishing diet improved the health, but not the paralysis. A week prior to labor she suffered from retention of urine, as well as from an inability to retain the contents of the bowel. Five weeks after parturition she had entirely recovered. The cure appeared to be permanent; chiefly I believe in consequence of the great care which was taken to keep up the general health, and her adherence to my urgent advice that she should lead a life of celibacy. In this instance it appeared to me, that the paralytic affection was not dependent upon the pressure of the gravid uterus, since the mischief commenced at too early a

period for this cause to act so powerfully. It rather seemed to be owing to "an irritation springing from various sensitive nerves;" and to be allied to that form of paraplegia which is sometimes due to disease, and particularly to displacement, of the virgin uterus. Lisfranc, Nonat, Romberg and others have related several cases of this kind of paralysis following disease of the womb, which were only cured by the relief of uterine disturbance. An instance reported by Dr. Brown-Séquard may be quoted as an example:

> In the year 1855, a young lady consulted this eminent physiologist for what she called an extreme weakness; but which was really a paraplegia, almost complete at each menstrual period. There was no diminution of any kind of sensibility; no paralysis of the bladder or rectum; no symptom of hysteria. Dysmenorrhœa, bearing-down pains, with a very sensitive and congested and anteflexed condition of the uterus alone existed. In a few days after the use of a bandage to support the womb, a great amelioration was evident; and in less than two weeks the paralysis had entirely ceased. It had lasted six months; and had been treated in vain by strychnia, galvanism, shower-baths, steel, and other tonics.[1]

The connection and reciprocal influence which exists between the brain and uterus is often so well marked, that it might be thought disease of the former would have an injurious influence on the progress of parturition. Daily experience teaches us, that mental impressions may suspend the pains of labor, and sometimes suppress the menstrual flow; while conversely, irritation of the ovarian or uterine nerves during pregnancy or the process of delivery, has excited an attack of convulsions or apoplexy or mania. But on examining the question more closely, it will be found that our speculations upon this head are without foundation. The uterus resembles the heart in more than one respect. Thus, it is a large hollow muscle; its contractions are mainly regulated by the ganglionic system of nerves; and its action is rhythmic, three periods being observable, viz., one of contraction, one of relaxation, and one of repose. The amount of influence which the three nervous centres exert upon the uterus during parturition is uncertain; some difference of opinion existing upon this, as on many other points connected with neural physiology. It seems, however, quite clear that the influence of the cerebrum need not be taken into much account: for we find that

[1] The Lancet, p. 415. London, 28th April, 1860.

uterine contractions occur just the same when all cerebral influences are withdrawn as when they are uninterfered with. The occurrence of labor in cases of hemiplegia, of complete paraplegia, of convulsions, as well as in the temporary unconsciousness produced by anæsthetics, proves this sufficiently. That the spinal system furnishes the uterus with nerves is certain from the many reflex relations of this organ. To take only one instance, we find that powerful contractions may generally be induced by the excitement of the mammary nerves, as happens when a child is placed at the breast. But it is probable that the largest supply of nervous force is derived from the ganglionic system; and this is shown by the process of parturition taking place when all spinal influence appears to be abrogated. Dr. Farre records the following example of this fact:

> A woman was attacked with paraplegia in the eighth month of pregnancy. She had neither sensation nor motion in any part below the umbilicus. No reflex movements whatever could be produced by tickling the soles of the feet. The fæces passed involuntarily, and the urine was drawn off daily. About the ninth month, her medical attendant, when about to pass the catheter, found a full grown fœtus in the bed (dead). The uterus was contracted, and the placenta in the vagina. The woman was entirely ignorant of what had occurred. Scanzoni and Chaussier relate similar examples of birth taking place notwithstanding complete paralysis of the sensitive and motor functions of the lower half of the body. In Chaussier's case the pressure was occasioned by a hydatid cyst which involved the cord on a level with the first dorsal vertebra.[1]

The powerful influence of the sympathetic ganglia and nerves is further shown in the uterine contractions which are sometimes manifested after death; as when delivery spontaneously takes place some time subsequently to the cessation of the maternal life. Hence it seems probable, that while the cerebro-spinal fibres maintain the relations of the uterus with other organs, the ganglionic system regulates the contractions of this viscus.

4. The hope has occasionally been entertained that pregnancy might exert a favorable influence upon patients liable to fits of *epilepsy*, if only by suspending the attacks during the continuance of gestation. Such expectations have very generally ended in disappointment. This result might be anticipated, if it were

[1] Cyclopædia of Anatomy and Physiology. Article, Uterus and its Appendages. Vol. v, p. 676. London, 1859.

merely remembered that irritation of the female organs of generation sometimes alone suffices to excite this disease; so that not a few authors—as Sauvages, Prichard, and others—speak especially of the *Epilepsia Uterina*. M. Malgaigne even mentions a remarkable instance in which the first epileptic attack came on during pregnancy, and the woman continued ever afterwards a sufferer from frequent seizures. The cases, however, where gestation actually provokes this disease must be few in number. Dr. Copland alludes to the history of a young lady, who was for a long period under his care on account of slight epileptic fits, connected with irregularity of the uterine functions and bowels. After marriage, she experienced a gradual amendment for some time; but her first labor was followed by a severe attack of puerperal mania.

On the other hand, in studying fully the causes of epilepsy, it does seem as if celibacy actually predisposed some women to suffer from this disease; and hence, since the year 1691, when Lanzoni recorded a cure by marriage, not a few physicians and patients have hoped for a similar result from this remedy. Dr. Sieveking refers to one of his patients, a widow of thirty-eight, who stated that she had been afflicted with fits for as long as she could recollect; but had been freer from them since marriage and childbirth than formerly. Nevertheless, while allowing that marriage tends to relieve many disorders of the sexual functions in women, yet this author very judiciously remarks, that as it is certain "the marital act itself may become an exciting cause of epilepsy, and as we know that the hereditary influence of the disease is great, we ought not to counsel epileptics to marry; as well on account of their partners, as on account of their offspring, unless the long time that has elapsed since the occurrence of a paroxysm, justifies a hope that the morbid taint is quiescent, if not extinct."[1] This advice is substantially the same as that given by Dr. Herpin; who remarks that he is acquainted with the histories of two young men and two women who married many years after they had been cured, while up to the date of his writing they had none of them had reason to regret taking such a step.[2]

Supposing an epileptic to become pregnant, the question of

[1] On Epilepsy and Epileptiform Seizures, p. 113. London, 1858.
[2] Du Prognostic et du Traitement Curatif de l'Epilepsie, p. 523. Paris, 1852.

course arises as to the power of medicine to afford relief. Unfortunately, no special remedy can be recommended as likely to do much good; but a certain amount of benefit will accrue from making every endeavor to improve the patient's general health, and also from administering such agents as are calculated to give tone to the nervous system. Hence, a simple but nutritious diet, must be allowed; with plenty of milk, cream, and two raw eggs daily. Intoxicating drinks of all kinds are, as a general rule, to be forbidden. The patient ought to take exercise in the open air; she should avoid late hours; and she must be warned of the consequences of exposing herself to anything calculated to produce mental excitement. Then, hypophosphite of soda or lime, cod-liver oil, large doses of tincture of henbane, bark, quinine, zinc, or one or other of the mild preparations of steel should be prescribed. Recollecting that epileptics improve for a time under every new plan of treatment, we must so husband our resources as to be able to vary the remedies; while everything should be done to make the sufferer place confidence in her physician. Faith and hope will often accomplish very much when all the drugs in the Pharmacopœia prove valueless, more especially in disorders of the nervous system. Finally, it is not to be forgotten that the tendency to epilepsy is frequently handed down from parent to offspring. Hence, a mother who suffers from attacks of this malady ought not to be permitted to increase her child's unavoidable predisposition to the same by suckling it. A strong and healthy wet-nurse is, if possible, to be procured; while the infant must be reared with the greatest attention to its physical and mental health.

5. Of the nervous affections which may complicate pregnancy, *chorea* is also one which demands some attention. The chief features of this disease consist—to use the definition of Romberg—in combined movements of one or more groups of muscles, independent of cerebral influence, increasing in violence when predetermined movements are attempted, and more or less interfering with the latter.

Chorea is rare after puberty, being most commonly seen in patients between six or eight and fifteen years of age. But occasionally it affects adult women, and is not very unfrequently found in connection with pregnancy. It is remarkable, that in

these cases the sufferers have rarely been troubled with the disease in early life; while it seldom occurs before the second month of gestation, and still more infrequently after the fourth. The attacks can sometimes be relieved by the employment of suitable remedies; but often they are very obstinate, and resist all treatment until after delivery. Moreover, primiparous women appear to be more liable to chorea than the multiparous, for of twenty recorded examples the patient was in her first pregnancy in no less than seventeen. It is also quite exceptional for it to set in after delivery. In the majority of instances both sides of the body are affected, though sometimes the disease is unilateral. So, also, the upper extremities are attacked alone in some women; and the same is the case with the lower limbs, though Romberg makes the contrary assertion. But undoubtedly, as a general rule, the chorea of pregnant females is bilateral. "The intensity of the movements," says Romberg, "is very marked, and they are often complicated with convulsions of an epileptic character. Many complain of a sense of numbness in the affected parts. The brain is almost invariably affected; and this is shown by headache, vertigo, a wild expression of the features, rolling eyes, unconnected speech, loss of memory, and great irritability."[1]

The symptoms and progress of this disorder when coexistent with pregnancy are often remarkable. As the best method of fixing the chief facts upon the memory of the reader, three or four of the most interesting cases recorded will be quoted. The first to be mentioned, shows well how violent the attacks sometimes prove:

A Jewess had suffered from chorea as a girl, and been successfully treated by Peter Frank. Fifteen years afterwards she married, and became pregnant; when an attack of chorea set in, more intense than Frank had ever witnessed during a practice of fifty years. The spasmodic movements continued day and night: there was perfect consciousness, yet the behavior was most violent. The integuments were covered with boils and gangrenous spots. None of the remedies employed had any effect. A miscarriage took place at the fifth month, and health was restored at the same time.[2]

Dr. Ingleby, in a course of Clinical Lectures, alludes to the

[1] A Manual of the Nervous Diseases of Man. Translated and Edited for the Sydenham Society, by E. H. Sieveking, M.D., p. 63. London, 1853.

[2] Frank's (Josephus) Praxeos, Medicæ universæ præcepta. Tomus I, p. 348. Lipsiæ, 1841.

histories of five examples which were all fatal. One of this gentleman's most remarkable cases was the following:

A female in the last month of gestation, had been suffering for six weeks from a violent headache. Soon after a venesection convulsions of the facial muscles supervened, which were communicated to the left arm; and which—after a second bleeding—spread over the greater part of the body. On the evening of the fifth day, the disease attained an alarming height; the patient spoke loud, rapidly, and almost unceasingly, though her consciousness was unimpaired; and the movements were so violent and universal, that it was necessary to hold her down by force. As, at the same time, parturient pains set in, it was thought advisable to rupture the membranes; upon which a dead child was born. The spasmodic symptoms, however, were in no way diminished; and after a short sleep, produced by opium, the movements became so much aggravated, that six people were scarcely able to restrain her. Twenty-four hours later death ensued, with all the symptoms of extreme exhaustion.[1]

Dr. Lever has reported the following interesting example of this affection, commencing at an early period of pregnancy. The chief points in the medical history need only be quoted:

Mrs. —— was married at the age of nineteen. She was of a cheerful and lively disposition, had enjoyed good health, and the uterine functions had been performed with regularity and without pain. A few months before marriage or just afterwards—it cannot be said which, owing to Dr. Lever's style being more poetical than distinct—she suffered once or twice from hysteric attacks; but conception took place "ere the torch of Hymen was extinguished." For the first two months the symptoms of pregnancy presented no special peculiarity; being chiefly mechanical, with gastric irritability. But at the commencement of the third month, a perceptible alteration took place in her manner; she became irritable and peevish, convulsive movements were observed about the muscles of the face, and these were followed in a week by a tossing of the head to and fro. The right arm next became convulsed, then the left, and afterwards the left and right leg. During the progress of the case, her mode of speech altered; her sentences were short; she hesitated before replying to a question, and when an answer was given she seemed to shoot it out. In spite of purgatives, zinc, iron, arsenic, digitalis, colchicum, nux vomica, bark, quinine, musk, ammonia, and the shower bath, no improvement took place; and she continued in the same condition until the close of gestation, when her memory seemed weakened, and fears were entertained lest she should become imbecile. At the proper period labor set in, and after an easy time she was delivered of a live girl. When the uterine pains were present, the convulsive movements ceased; but in the intervals they were distressing. Delivery was succeeded by a long and quiet sleep. The patient was better on waking; the symptoms gradually subsided; and at the end of a month no trace of chorea was left. The supply of milk was copious, and she weaned her infant at the seventh month. The

[1] The Lancet, p. 783. London, February 22, 1840.

child at the time of the report was seventeen years old, of a slender figure, quick and irritable, and impatient of rebuke. At the age of twelve she had a slight attack of chorea, induced by fright; but the attack was soon removed, and at the time of removal the catamenia appeared, and afterwards continued regular.[1]

Dr. Robert Lee gives an account of a young woman, in the sixth month of her second pregnancy, who died of chorea on the 29th August, 1840, in St. George's Hospital:

The symptoms were at first slight, and were apparently produced by a fright. The convulsive movements, however, became so violent, that it was found necessary to put on a strait waistcoat, and fix her down to the bed. Forty-seven hours before death the contents of the uterus were expelled. On examining the body after death, the brain and spinal cord were perfectly healthy. There were some small vegetations on the mitral valve. The right kidney and ureter were wanting; the supra-renal capsule was present. The uterus was in a natural state. The corpus luteum was unusually small, and the coats of the Graafian vesicle could scarcely be seen within the yellow matter. Dr. Lee asks the pertinent question,—Whether, when the treatment failed to relieve the symptoms, and they became violent and dangerous, would it have been advisable to induce premature labor?[2]

Dr. J. Matthews Duncan relates two cases of partial chorea, which need not be further mentioned than to say that they are interesting for these reasons:

The lower limbs were the parts affected with the involuntary movements. The attacks were periodical in their character, the movements occurring in one case only in the evening and early part of the night, and in the other being troublesome merely in the night, unless the patient sat in one position for a long time. The treatment consisted chiefly in the administration of steel and opiates; and both patients got well after a few weeks of medical care, and at least two months before delivery.[3]

And lastly, Dr. Lawson Tait has favored me with the particulars of the following case, which well illustrates the dangerous nature of this disease:

E. T., a delicate blonde, suffered frequently from rheumatic fever during childhood; the last attack, when in her sixteenth year, ending in chorea, which continued several months. She married at the age of twenty-two. During her *first* pregnancy, chorea set in at the fourth month; it ceased, as she said, "the moment the infant was born." In the *second* pregnancy, the chorea came on earlier, and was more violent; but it stopped with parturition.

[1] Guy's Hospital Reports. Second Series. Vol. v, p. 4. London, 1847.
[2] Clinical Midwifery. Second edition, p. 112. London, 1848.
[3] Edinburgh Medical and Surgical Journal. Vol. lxxxi, p. 35. Edinburgh, 1854.

With the *third* gestation, the diseased movements commenced before she knew positively that she was pregnant; abortion at the third month was followed by a cure. Pregnancy at once occurred for the *fourth* time, and chorea manifested itself immediately. When Dr. Lawson Tait saw her, on 19th June, 1867, the pregnancy had advanced to about 3½ months. The movements were extremely violent; the tongue was much bitten, sleep was impossible, and the urine contained sugar. As the disease became aggravated, abortion was induced on the 26th. The movements ceased for many hours, but then returned with augmented severity. She was kept under the influence of chloroform for twenty-four hours; but death took place on the 29th, with symptoms of apoplexy.

At the autopsy, on examining the brain, there was found a clot formed by blood effused from the anterior part of the velum interpositum, towards the left side. The heart was healthy. There were no indications of any ill consequences from the abortion. No appearance of disease in any other organ.

The treatment of chorea is not of necessity to be materially modified because of the state of gestation. Hence as in the St. Vitus's dance of childhood, the chief indications are to regulate the bowels, to subdue irritation, and to strengthen the system. When purgatives are required, they must, as will by and by appear, be well chosen; drastic cathartics, preparations of aloes, and large doses of senna, being inadmissible. Opiates prove beneficial in many, if not in all cases; but especially are they useful when the urine contains sugar, as it sometimes does in these cases. Remembering that during sleep the irregular actions of the muscles usually cease, we may often advantageously give the sufferer the great benefit of tranquil repose by the aid of chloroform. The tonics which do most good are of the ferruginous kind; and few preparations of this class act better than the officinal wine of citrate of iron, the citrate of iron and ammonia, the saccharated carbonate of iron, the citrate of iron and quinia, or the reduced iron. Sometimes, the arseniate of iron, in doses varying from the one-twelfth to the fourth of a grain, proves useful. Where any fear of abortion or premature labor is entertained, it is perhaps advisable to trust to the hypophosphite of soda or lime with bark, instead of employing any preparation of steel. When cod-liver oil can be digested, it proves of singular service; but it is useless trying it if nausea be induced. I am inclined to think that the light-brown oil of Dr. de Jongh is more easily taken for a long time than most other varieties. Of course, with any of these measures it will be necessary that the patient be allowed a good nourishing diet, milk or cocoa being taken in the

place of tea and coffee; that she be advised to take moderate exercise in the open air, if her condition permit; and that mental excitement be guarded against as much as possible. With regard to shower or douche baths it may be said, that it will usually be better to try and do without them; though ordinary tepid baths, especially if made as salt as sea-water and administered so as to give no shock to the system, will often be of advantage. And then, supposing all our efforts fail to give relief, I entertain no doubt but that abortion or premature labor should be induced; taking care, however, not to wait so long before resorting to the necessary proceedings that the patient's strength is exhausted.

6. An author may well congratulate himself when he can with justice assume that such a disorder as *hysteria* needs no description at his hands. For who can accurately paint the features of this protean malady? What writer, however ready with his pen, can detail a tithe of the symptoms presented by those afflicted with this disease? Every example of it is a study to the most experienced practitioner. Not only are no two cases alike, but each case presents ever-varying phenomena. For hysterical women—as Sydenham admirably says—observe no mean in anything; they are constant only to inconstancy.

Taking it for granted, then, that most of my readers are acquainted with the principal forms and varieties of this disease, and referring those less enlightened to the wards of our hospitals and to special books upon the subject, I shall here confine myself—as is my province—to the consideration simply of two questions. The *first* is, as to the propriety of recommending marriage for young hysterical females? Since the days of Hippocrates innumerable writers have replied to this inquiry in the affirmative; and with certain reservations the answer must be allowed to be correct. Hysteria originates during the period of sexual maturity. A morbid sexual state, either physical or mental, often—to say the least—lies at the root of it; for the disease is very seldom witnessed in young women whose uterine functions are perfectly normal, or in such as are happily married.[1] Its victims are young single girls suffering from chlorosis, ovaritis,

[1] We know that Hindoo women are married prior to the appearance of the catamenia; and it is said, though I know not with how much truth, that hysteria is almost unknown among them.

amenorrhœa, leucorrhœa, or dysmenorrhœa; women who are united to men that they dislike, though they probably have to hide their unhappiness from the world; or females who have become widows during the prime of life. If, then, we allow that a happy marriage is the grand remedy for very many hysterical diseases, we ought to take care only to recommend this step when all bodily disease has been removed; and when there appears to be something more than a mere chance that it will benefit the particular case before us. In other words it may be said, that general principles must not be relied upon too implicitly in the consideration of this subject. The remarks of Mandeville on the responsibility of physicians advising marriage as a remedy are worthy of notice, though they are not altogether in accordance with the views here advocated. He says: "But I never prescribe an uncertain Remedy, that may prove worse than the Disease; for not to speak of the many Inconveniences the advising it often puts People to (præterquam quod januam aperit nequitiæ), in the first place it may fail, and then there are two People made unhappy instead of one; Secondly, it may but half cure the Woman, who, lingering under the Remainder of her disease, may have half a dozen children, that shall all inherit it. A Physician has a publick Trust reposed in him: His Prescriptions by assisting some, ought never to prejudice others."[1]

The *second* point which remains to be spoken of is as to the influence of hysteria on pregnancy and delivery. On this head I have not much information to impart. But it seems that when a woman suffers from aggravated hysteria during the period of gestation, there is some reason to fear that the parturient state may be followed by an attack of puerperal mania. Thus the following observation is made by Dr. Burrows: "I have seen two cases where hysterical symptoms attended during pregnancy, and the patients almost immediately on delivery became insane." And again he remarks: "Puerperal delirium consequent on labor is sometimes predicated, though not absolutely developed, during gestation. If while pregnant there attend *frequent hysteric affections*, preternatural susceptibility, unaccountable exuberance or depression of spirits, morbid aptitude to exaggerate every trivial occurrence and attach to it great importance, sus-

[1] A Treatise on the Hypochondriack and Hysterick Diseases. Third Edition, p. 307. London, 1730.

picion, irritability, or febrile excitation, or, what is still more indicative, a soporous state, with a very quick pulse, then the supervention of delirium on labor may be dreaded."[1] Dr. Gooch relates the history of a lady unusually subject to the common forms of hysteria, who was delivered at the seventh month of a dead child, and who subsequently suffered from catalepsy and monomania. The following is an outline of the case:

Mrs. —— is twenty-nine years of age. She has long been unusually subject to the common forms of hysteria. Her husband says he has often seen her become apparently insensible whilst sitting at the dinner-table, the state of unconsciousness lasting several minutes. She married nine years ago, has been pregnant many times, but has only borne one living child. A few days after her last delivery, of a dead child, at the seventh month, she was seized with violent pain in the left side of the head and face, which subsided under the use of hemlock; but she continued to suffer from flatulence, a quick weak pulse, and much mental depression. One evening she told her husband that she had never properly discharged her duties as a wife, and that her death would be a happy release both to him and her. The next morning she made an unsuccessful attempt to cut her throat; and afterwards was very violent. Soon she became cataleptic, and lost all consciousness. She had three paroxysms of cataleptic symptoms; the first attack lasting fourteen hours, the second for twelve hours, and the third for nine hours. The delirium then assumed the ordinary form of melancholia. Three months from her delivery she was well enough to resume her domestic duties.[2]

7. Women have suffered from *tetanus* setting in after abortion just as they have done so after the termination of natural labor, or after lesions of the unimpregnated uterus. Fortunately, this fatal disease is very rare under either of these circumstances. Thus, in a table of 171 published examples of tetanus collected by Dr. Laurie,[3] there is only one case in which it was due to abortion, and one in which retained placenta is said to have been the source; while in fifty-two instances found by the same gentleman in the Records of the Glasgow Infirmary, there is not one report of its occurrence in obstetrical practice. Other cases are, however, to be discovered scattered through the various British and foreign periodicals. In an essay on puerperal tetanus, Sir James Simpson has brought together the histories of seven undoubted instances of this disorder following early mis-

[1] Commentaries on the Causes, Forms, Symptoms, and Treatment, Moral and Medical, of Insanity, pp. 364 and 366. London, 1828.

[2] An Account of some of the most Important Diseases peculiar to Women, p. 112. Second Edition. London, 1831.

[3] Glasgow Medical Journal. Vol. i, p. 339. Glasgow, 1854.

carriage, in all of which death occurred; as well as sixteen similar examples of this affection succeeding to parturition at or near the full time, thirteen of which ended fatally.[1] When tetanus has supervened upon abortion it seems to have generally happened after the sudden cessation of the discharge from the use of astringents or of the plug; this cessation having been followed by exposure to cold. So when it takes place after delivery, the abrupt suppression of the lochia from the influence of cold or damp seems to have been the starting-point of the disease.

The instance of tetanus following a retained placenta which was just referred to occurred in the practice of Dr. Storer, and presents some instructive features. The chief facts which are to be gleaned from the report are these:

On the 20th September, 1841, Mrs. C——, aged thirty-eight, was delivered of her third child after a natural labor. The umbilical cord was large, and so feeble that on passing the finger along it to the attachment in the placenta it separated at its origin. The placenta, which was very firm, was situated high up on the anterior face of the uterus; and it adhered throughout its whole extent with such force to that organ, that Dr. Storer could not detach it in the slightest degree. Having made such efforts as were thought proper without any success, the patient was left. On the 22d September, the bowels were freely opened by a dose of castor oil and an enema; but there was no appearance of the placenta being detached. On the 23d the lochia were quite offensive, and vaginal injections of chamomile tea were ordered. But little change took place in the appearance of the patient on the 24th and 25th; except that repeated chills were noticed on the former of these days, which were followed by a slight secretion of milk, and upon that and the following day the child was nursed. On the morning of the 26th, the commencement of the sixth day, Dr. S. removed a small fragment of the placenta, which had been thrown into the vagina, and feeling more beyond it which could not be seized, a dose of ergot was given. After a second dose two masses of placenta similar to the first passed away. On the 27th the pulse for the first time since delivery was upwards of 100, small and wiry; the patient complained of pain in the head, considerable stiffness of the jaws, and a difficulty in swallowing. These symptoms rapidly increased, and at eleven o'clock P. M., the tip of the tongue could scarcely be protruded between the teeth. The muscles of the neck and jaws had become much more painful, the respiration was laborious, and at irregular intervals there were tetanic spasms. On the morning of the 28th it was found that she had passed a very restless night; the muscles of the jaw were so rigid that the mouth could not be opened in the slightest degree; while the merest touch appeared to distress her, and to hasten the spasmodic action which was every few minutes present. The head was thrown backward upon

[1] Edinburgh Monthly Journal of Medical Science, p. 97. February, 1854. Republished in The Obstetric Memoirs and Contributions, vol. ii, p. 49. Edinburgh, 1856.

the pillow, and so firmly contracted were the muscles of the neck, that when her hand was placed at the back of her occiput, the whole body was brought forward, the neck not being flexed in the slightest degree. When the spasms were present, the suffering appeared to be extreme; and the paroxysms increased in frequency and severity until about midnight of this, the eighth day, when she sank exhausted by opisthotonos.—No post-mortem examination was allowed to be made. It may be observed that there were no symptoms of metro-peritonitis.[1]

An interesting example of intermittent tetanus occurring during pregnancy has been published by Dr. Trevor Morris. This gentleman says:

Mrs. S——, aged twenty-two, in her second pregnancy, was placed under my care for her confinement, which she expected to take place in July, 1862. I saw her early in April, when she was tolerably well. She had had some little time before what she calls "dead ague." There is a previous history of her having had, at the age of fourteen, fits brought on by excessive fright, and during which she had bitten her tongue.

On April 19th, at seven P. M., I was hurriedly sent for to see her. I found her on the floor; the limbs and trunk in a state of rigid spasm; frothing at the mouth; jaw locked; fingers firmly clenched on the palm; body curved forwards, &c. In this state of emprosthotonos she remained about half an hour, when the spasm yielded, but only to assume after a few minutes the form of opisthotonos, which was most perfect, and which lasted for half or three-quarters of an hour, when she gradually recovered, with merely an occasional sob. On questioning her, I found that the first indication of the approaching seizure was a numbness in her legs, which felt as if they would not support her, obliging her to sit or lie down; and on subsequent occasions she would exclaim, "My legs are going!" From the moment of attack to its termination all consciousness was lost; severe congestive pain of the head followed, which lasted some time. She had had previous threatenings on two or three consecutive days, and always at the same hour. As I found her bowels were constipated, I ordered her ten grains of calomel at night, and a warm aperient draught for the following morning, which brought away some scybala at the first action. She was to take six grains of quinine half an hour before the expected time of attack, or earlier should symptoms demand it. Being over-anxious to avert it, she took the draught before symptoms actually connected with the approaching attack appeared. It was, however, much modified, as was also the consequent congestive headache. As her tongue was coated, I ordered her dilute nitric acid with nitric ether and tincture of orange-peel, and she was again to take the draught in the evening as usual, which this time prevented a recurrence. She now took two grains of quinine three times a day. She had one or two other attacks from neglecting this precaution, but by a little attention from time to time future ones were averted. She went her full time, and was delivered of a living child on July 15th.

Such cases as these must be rare, as this is the first that I have seen or heard of during a residence of five years in a malarious district. There are

[1] American Journal of the Medical Sciences. Vol. xxix, p. 97. Philadelphia, 1842.

in this case traces of hysteria and epilepsy combined, as evidenced by previous history; perfect unconsciousness during the attack; no remembrance of it; sobbing at its conclusion, though ending neither in sleep nor crying. In each attack the form of emprosthotonos was that first assumed, then that of opisthotonos. The patient made a good recovery, is now well, and certainly anything but an hysterical subject.[1]

The treatment of tetanus occurring during gestation, or after parturition, has to be conducted according to the same rules which influence the practitioner in attempting to cure this affection when it arises independently of childbearing. I shall therefore only make one remark on this head. The disease essentially consists in an exalted reflex excitability of the spinal system. Consequently, our efforts must be directed towards diminishing this state by keeping the patient in the most perfect quietude, and by the exhibition of antispasmodics and narcotics. The subcutaneous injection of the officinal solution of atropia is deserving of trial; not more than two minims (gr. $\frac{1}{30}$) being employed at first. The extract of Calabar bean (Extractum Physostigmatis, gr. $\frac{1}{12}$ to $\frac{1}{4}$) is also a remedy from which much may be expected. Chloroform, in consequence of its direct sedative action upon the reflex nervous system and upon muscular contractility, is invaluable. This agent is not recommended as a last resource. It has been employed successfully in cases of traumatic tetanus; and though, of course, it has often failed, yet perhaps—as Sir James Simpson suggests—some of the failures have arisen from the patient not having been kept sufficiently deeply and continuously under its influence. The effects of this drug may have to be sustained even for many days; which with care may be done without danger. In an apparently hopeless case of convulsions in an infant of only six weeks old, Sir James Simpson employed chloroform almost continuously for thirteen days; using in this time as much as one hundred ounces of the drug. The disease yielded; and a few months afterwards the little patient was a strong and healthy child. When the heart's action is at all feeble I much prefer a mixture of equal parts of chloroform and pure ether, to the former agent by itself. Moreover, if the induction of anæsthesia fails to save life, it at least affords the blessing of relief from the most frightful suffering; and it is not possible to over-estimate the importance of assuaging the agony

[1] The Lancet, p. 331. 27th September, 1862.

to which the tetanic spasms give rise. Though many years have elapsed since the following passages were written, yet the advice inculcated may still be enforced with advantage: "Nay further, I esteem it the office of a physician," says Lord Bacon, "not only to restore health, but to mitigate pain and dolors; and not only when such mitigation may conduce to recovery, but when it may serve to make a fair and easy passage: for it is no small felicity which Augustus Cæsar was wont to wish to himself, that same *Euthanasia;* and which was specially noted in the death of Antoninus Pius, whose death was after the fashion and semblance of a kindly and pleasant sleep. So it is written of Epicurus, that after his disease was judged desperate, he drowned his stomach and senses with a large draught and ingurgitation of wine; whereupon, the epigram was made, *Hinc stygias ebrius hausit aquas;* he was not sober enough to taste any bitterness of the Stygian water. But the physicians contrariwise do make a kind of scruple and religion to stay with the patient after the disease is deplored; whereas, in my judgment, they ought both to inquire the skill and to give the attendances for the facilitating and assuaging of the pains and agonies of death."[1]

8. It has been generally admitted until the last few years, that *when pregnancy occurred in a phthisical patient the progress of the consumption was retarded; but that after delivery the organic lesion proceeded more rapidly, and death more speedily ensued.* The theory has been this: That as during pregnancy all the powers of the system are concentrated upon the uterus, so this organ prevents or retards disease in all other parts of the animal economy. This doctrine was advocated by most authorities of note, until Dr. A. Grisolle published some observations showing that it is quite untenable.[2] This gentleman's essay is so elaborate, and his arguments appear so well-founded, that I am sure a brief analysis of his memoir will be useful. Dr. Grisolle's views are based upon the histories of twenty-seven cases of phthisis occurring during pregnancy. In twenty-four of these the organic disease began during utero-gestation, at a period more or

[1] The Advancement of Learning. Book the Second. Spedding and Heath's collected edition of Bacon's Works. Vol. iii, p. 375. London. 1857.

[2] Archives Générales de Médecine. Quatrième Sèrie. Tome xxii, p. 41. Paris, 1850.

less near its commencement; while in only three did the rational signs of tubercle exist prior to pregnancy, though the disease did not actually manifest itself until a later period. In none of these cases was the pulmonary affection retarded: on the contrary, it made rapid progress.

When we reflect on the profound influence which pulmonary tubercles exert on the constitution, as well as on the uterine disorders which so generally supervene at an advanced period of the disease, we can readily understand why conception should rarely take place in phthisical women. In almost all the cases in which phthisis coexists with pregnancy, it is found that the latter has occurred first, and that it is in a more or less advanced period of its course that pulmonary tubercles have suddenly manifested their presence. Thus, there is no antagonism between pregnancy and phthisis; but gestation does not modify nor exert any tardative effect on the pulmonary lesion. The phenomena of the disorder are developed with the same regularity and constancy. Pregnancy does not increase the violence nor frequency of certain accidental symptoms of phthisis; for the dyspnœa is not more painful, there is no increased tendency to diarrhœa, neither is hæmoptysis more frequent. But in all the cases the actual duration of the disease was shortened; for in all, the disease terminated at from the eighth to the fifteenth month from the commencement of the symptoms, while its mean duration was only nine and a half months. These results then, that there is no essential difference in the symptoms between the phthisis of pregnant and non-pregnant women, and that pregnancy, instead of prolonging life, hastens the progress of the organic lesion, seem to be clearly established; and it is difficult to imagine with respect to the last fact—how the opposite hypothesis ever became current. The system weakened by loss of appetite, diminished power of assimilation, night sweats, diarrhœa, copious expectoration, and hectic fever, can hardly be thought to be in such a favorable position as to be better able to support two lives than one. But the history of medicine shows that not unfrequently when the plain common-sense truth stares us in the face, we prefer turning aside in order to advocate or establish a theory, the only charm of which is its improbability.

With respect to the second current opinion, that the puerperal state accelerates tuberculization, and consequently hastens death,

it need only be said that in practice such is ascertained to be the exception, not the rule. Dr. Grisolle found that twelve women, some of whom at the time of delivery were in the second, but the majority in the third stage of phthisis, continued to struggle, on an average, for four months afterwards against the progress of the disease; while in all, the symptoms were those observed in ordinary cases. In ten other phthisical females who were only in the first, or at the commencement of the second stage, the progress of the disease after delivery was slow in three; there was a notable aggravation in two; while the general symptoms manifested a sensible amelioration in the other five. Hence, if we wish to draw any rule from these cases it must be—that the organic disease is often mitigated after delivery, provided it has not reached an advanced stage.

But it may be asked, if neither pregnancy nor the puerperal state have that influence upon the progress of phthisis which many have attributed to them, what is the opposite state of matters? In other words, to what extent does phthisis modify the course of pregnancy and the sequelæ of parturition? There can, it would seem, be little doubt but that in the majority of instances tuberculization does not materially influence the progress of pregnancy. Very many cases have now been carefully watched where the pulmonary disease had even reached its third stage, and yet gestation has proceeded uninterruptedly to the full term. The more closely I have investigated this question the more convinced do I feel, that a pregnant woman suffering from any lowering chronic disease is not less likely to carry her fœtus for nine months than one who is strong and healthy. The opposite opinion has gained supporters from the fact of no sufficient distinction being drawn between a diseased embryo and a diseased mother. The latter may suffer from chronic heart or lung disease, hepatic or renal affections, scrofula, cancer, diabetes, &c., without the former being appreciably affected during its intrauterine life. In this respect there is a marked difference between chronic and acute diseases; for whereas, perhaps, in a large number of cases of phthisis coexistent with pregnancy, premature labor would only occur in one-sixth of the whole, in pneumonia it would probably do so in three-fourths, or even more. In the one case we have a disease coming on so gradually, that the system may be said not to feel any shock; in the other, there

is sudden and severe constitutional disturbance, more allied to that which results from a dangerous accident or a capital operation.

The only influence of pulmonary consumption on the process of parturition would appear to be that it shortens the duration of the suffering, and lessens the violence of the pains; so that the labor is seldom extended beyond four hours. The simple explanation of this circumstance is obviously, that the relaxed and flabby tissues offer diminished resistance to the passage of the child. The lacteal secretion has generally been found to be freely established shortly after labor; but forasmuch as suckling would be very injurious to a consumptive mother, and would probably produce both present and future disastrous results in the infant, it has not usually been allowed beyond the first few days. When the mother has insisted upon nursing, the milk has either very much diminished in quantity, or has entirely ceased to be secreted within a period varying from one to four weeks; and lactation for this short time has materially aggravated the maternal disease, while the infants have also been great sufferers. Indeed, of almost all children, those born of a phthisical parent most imperatively demand that they should be reared by a young and vigorous and healthy wet-nurse; for otherwise they are almost sure to suffer early from mal-nutrition in a marked degree, and at a later period to fall victims to some form of tubercular disease.

9. The question next arises as to the influence which an attack of *pneumonia* may exert upon the progress of gestation? The most common result undoubtedly is the termination of the pregnancy by the expulsion of the fœtus. This effect takes place possibly in three out of four cases. How can such a fact be explained? It cannot be owing to the violence of the cough, as some suppose, because women affected with severe bronchitis, or with asthma, do not abort. It is not probable that it is produced by the intensity of the fever or by the inflammation *per se*, because a similar result does not happen in nearly the same proportion of cases of encephalitis, pleurisy, hepatitis, or enteritis. Neither does it seem to be accounted for by the importance of the organ affected; since in pulmonary phthisis we have not a like effect. No doubt the suddenness as well as the severity of the attack may

have a very unfavorable influence upon the state of pregnancy; but obviously, from the foregoing observations, not sufficient alone to account for the circumstance under consideration. The true explanation is I believe to be found in the condition of the blood in acute inflammation of the lungs. Now it is well known that in this disease there is either a great deficiency of chloride of sodium in, or a total absence of this salt from, the urine; and it has been proved, that such a diminution or absence conclusively indicates that the circulating fluid contains less than the normal quantity. The two chief facts which may be adduced as favoring my view are these. First, that in the textures of the embryo, a large proportion of fixed chloride is present. Thus, Lehmann examined the femur of a six months' fœtus, and found 10.138 per cent. of chloride in the ash, while he could only obtain from that of adult bones 0.7 to 1.5 per cent. So also it is probable that there is a determination of chloride of sodium to the tissues of the gradually increasing uterus; but at all events the researches of Voigt show us that there is a considerable quantity of this salt in the liquor amnii, which salt diminishes as gestation advances. Secondly, Mulder and various observers have noticed a diminution of chloride of sodium in the blood in cases of cholera; and it so happens that this disease appears to give rise to premature expulsion of the fœtus just as often as pneumonia does. Dr. Bouchut has shown that in fifty-two cases of cholera occurring in pregnant women, twenty-five aborted in consequence of the disease; while he infers that the same result would in all probability have taken place in a larger number had it not been prevented by the early death of the patients. Moreover, with a few exceptions, abortion took place only in those cases in which the disease lasted over twenty-four hours; when, consequently, the altered condition of the blood would be fully appreciated by the various tissues. The objectors to this hypothesis may reasonably urge, that the absence of fixed chlorides from the urine occurs in many acute inflammatory diseases besides pneumonia. But the answer to this assertion seems to be, that in inflammation of other organs this diminution is scarcely to the same extent as it is with inflammation of the lungs; while we also know that abortion does occur in all these cases, though it is most common in the pulmonary disease.

It only remains to be noticed that pneumonia is much more

fatal to pregnant than to non-pregnant women. It is also considerably more dangerous when it produces abortion than when it does not interrupt gestation. And further, when the morbid action sets in at a time near the natural period of labor, it has a most disastrous effect upon the fœtus; which is usually either born dead, or in so feeble a condition that it cannot be kept alive beyond a few hours after birth.

10. More than thirty years ago Dr. Larcher, arrived at the conclusion that *the heart is normally in a state of hypertrophy during gestation*, although his views have only recently been fully published.[1] This gentleman's investigations were pursued at the Maternity Hospital of Paris; and were based upon the circumstance that in 130 post-mortem examinations of women who had died mostly from puerperal fever there was not found a single exception to this rule. The walls of the left ventricle were increased by at least a fourth or a third in thickness, while at the same time their texture was firmer and their color brighter. The right ventricle and the auricles were found to have retained their normal thickness. Twenty years later Dr. Beau examined the question anew; while at his suggestion M. Ducrest, Interne of the Maternité, carefully noted the heart's condition in 100 other women, and confirmed Dr. Larcher's statements.

Within certain limits this condition is of course compatible with the maintenance of perfect health; but it may also be received as the explanation of that predisposition to congestion of the different viscera which often marks the state of gestation. Probably, as a general rule the hypertrophy gradually but slowly disappears after parturition; though in exceptional instances it may be otherwise, especially when pregnancy recurs frequently and at short intervals. There seems some reason to believe that this change is the cause of those permanent lesions in the organs of the circulation which are not unfrequently met with in women who have borne many children in the space of a few years, or while in a bad state of health. So also it is said that the bronchitis which is so common during gestation derives much of its character from the persistence of this condition of the heart. And again, it may account for the various forms of hemorrhage

[1] Archives Générales de Médecine. 5^{me} Série. Tome xiii, pp. 291–306. Paris, 1859.

that often occur in pregnancy; as epistaxis, hæmoptysis, and apoplexy.

Sympathetic or nervous throbbings of the aorta not unfrequently cause much annoyance in the early and middle periods of pregnancy. The throb has generally a jerking and abrupt character; it seems to occupy the whole line of the vessels, rather than to be circumscribed; and its maximum of intensity is often found about the umbilical region. In the advanced stages, palpitation combined with dyspnœa has generally a mechanical cause; that is to say, it depends upon the pressure of the gravid uterus upon the large vessels of the abdomen. The womb also pushes the diaphragm upwards; while by preventing its descent easy respiration is interfered with.

11. The fact has been established by the observations of several physicians, *that carcinoma of the lips and cervix of the uterus does not prevent conception.* Even when the disease has reached the stage of ulceration, and the watery and sanguineous discharges are abundant, an ovule may become fertilized. Under the same circumstances it is also certain, that the ovum may be gradually developed and retained in utero until the completion of the natural term of gestation; abortion or premature expulsion of the fœtus being an exceptional occurrence. When the pregnancy proceeds uninterruptedly nearly or quite to the full term, the labor is commonly found to be difficult and tedious, and invariably very hazardous to the mother; while the consequences to the child are often very disastrous. If the disease should form any serious obstacle to the passage of the infant, and especially if the difficulty be such as cannot be overcome by the cautious use of the knife or of obstetric instruments, rupture of the uterus is the common result. Moreover, supposing delivery to be safely accomplished, the process of parturition seems decidedly to give an impetus to the destructive tendency of the cancer, particularly by exciting inflammation and softening.

These remarks will be best proved by a short reference to certain statistics:

In looking through the few English and French treatises or essays devoted to the subject of abortion, carcinoma of the uterus is scarcely mentioned as a cause. In our periodical literature numerous examples of obstructed labor, at the full term, from cancer of the cervix uteri are related; but none of mis-

carriage from this disease. Of thirty cases of cancer and seven of cauliflower excrescence with pregnancy, reported by Puchelt, five died undelivered, four of them with ruptured uterus. Of the thirty-two delivered naturally or by art, sixteen perished during or soon after labor; thirteen survived their accouchement; while of three the issue is unknown. In these thirty-seven cases, only ten of the children were born alive; seventeen were still born; five were undelivered; and of five no account of the viability of the infants is given. Of twenty examples advanced to the full term of pregnancy, with four to the end of the seventh month, collected by Dr. Menzies, of Glasgow, four of the women died undelivered, and ten within the puerperal month; while of the ten that survived longer, labor occurred in one at the end of the seventh month, and in five the disease implicated only a portion of the circumference of the os. In one of these the disease consisted merely of four or five small tubercles, and the subject of it recovered from three successive labors, in which she bore one dead and two living children. In three of these twenty-four cases the cervix was lacerated; in one a large disc was detached from the lower part of the uterus during parturition, and the mother survived six months; in two the body of the uterus gave way, and the patients died soon after delivery; in another rupture produced death before delivery could be effected; while in one the woman died undelivered, from low peritonitis, seventeen months after the commencement of gestation, without the rigid os uteri having yielded to the feeble muscular contractions. From the twenty-four cases twenty-six children resulted; of whom eight were alive, eleven were stillborn, four were undelivered, and of three the fate is unknown.

The treatment of pregnancy when complicated with uterine cancer is surrounded with difficulties, so that it is almost impossible to lay down any very precise rules for the guidance of the obstetrician. Probably the favorite proceeding with most practitioners is the induction of abortion; or, at a later period, of premature labor. The former is had recourse to if the disease be in an advanced stage, or if it implicate the whole of the os uteri; while the latter is resorted to between the thirty-second and thirty-sixth week where the affection is less extensive. But I doubt very much the prudence of adopting this practice in the majority of instances. As Dr. Menzies remarks,—"There are serious objections to following this counsel in all cases. It will frequently be found that the cervix is so narrowed or entirely obliterated by the cancerous deposit, that the membranes cannot be reached without inflicting such laceration and contusion as may induce hemorrhage or inflammation. If the disease is extensive, the contraction great, and pregnancy advanced to the seventh month, delivery must be accomplished with such difficulty and danger, as should cause us to hesitate in accelerating a crisis, whereby our patient may be deprived of two months at least of her existence. It is, moreover, a well-established fact

that parturition accelerates the destructive action of the disease, while pregnancy appears to impede it; hence in cancer far advanced, where great loss of structure has rendered the os more patent, and the passage of the head comparatively easy, premature delivery would likewise hasten the fatal issue. I think, however, that in some cases where the scirrhus has not made much progress, Dr. Kiwisch's plan of inducing abortion, as modified by Dr. Tyler Smith, would afford us a means of prolonging life, further than would be attained by allowing the pregnancy to be matured."[1]

In an example of multiple medullary cancer, complicated with pregnancy advanced to the fifth month, which I saw with Dr. Thane in July, 1862, it was thought advisable to make the uterus expel its contents prematurely, chiefly with the view of increasing the mother's comfort. Of course, in this instance, the proceeding was not contraindicated by any feeling for the child; as owing to the increasing amount of cancerous deposit in the recto-vaginal septum, it was certain that a live infant could never be given birth to through the natural passages.[2]

Supposing that the pregnancy has gone on until the full term, and that the natural efforts appear insufficient to accomplish delivery, assistance must be afforded at a somewhat early period to avoid the risk of rupture of the uterus, or of exhaustion from failure of the woman's already diminished vital powers. Under these circumstances turning has been performed in several instances; but in all, according to Dr. Menzies, with the loss of both mother and child. The application of the forceps has been recommended by many writers; but the use of this instrument is clearly inadmissible unless the os be dilated, the pelvis well-formed, and the deposit thin and elastic. Of course these are just the instances where sufficient space is afforded spontaneously, and hence where delivery can take place without any artificial aid. Craniotomy succeeds well for the mother in some carefully selected cases; or possibly cephalotripsy might be advantageously had recourse to. But then it must be recollected, that if the os uteri be rigid and contracted from induration of its tissues, there

[1] A Case of Pregnancy complicated with Carcinoma of the Uterus, in which Gestation was prolonged to the Seventeenth Month. By P. Rae Menzies, M.D., &c. The Glasgow Medical Journal, vol. i, p. 138. Glasgow, 1854.

[2] This case is reported at length in the Transactions of the Obstetrical Society of London, vol. iv, p. 243. London, 1863.

is great danger of laceration occurring, even from drawing a much-mutilated child through the diseased maternal passages. Moreover, many men may conscientiously object to sacrifice the existence of a healthy infant for the mere chance of giving a few weeks of suffering to a woman afflicted with a fatal disease. Hence it is a subject for congratulation that the life of the child can often be spared by means which do not materially, if at all, prove detrimental to the mother. This desirable end is to be attained by resorting to vaginal hysterotomy. After the necessary incisions have been made into the os and cervix uteri, we may either trust to the natural efforts to complete the labor, or we may apply the long forceps, or we may even turn and deliver the infant by the feet. When performing the operation of hysterotomy it is as well to remember that the safest plan is to make four incisions; viz., one obliquely and anteriorly on each side, and two obliquely and posteriorly. In this manner the surgeon will avoid the risk of wounding the uterine arteries, which run tortuously upwards on the sides of the womb.

Where the carcinomatous infiltration proves so extensive as entirely to prevent delivery *per vias naturales*, it only remains for the surgeon to extract the child, if alive, by the Cæsarean section. In two or three instances, in this country, the infant has been saved by this proceeding, when it has been had recourse to under these circumstances; while in three comparatively recent cases, the mother has lived for some months after the operation. In fact, she has quite recovered from the latter, but has subsequently succumbed to the original disease. It is indeed remarkable, that of late years those cases of Cæsarean section appear to have done the best where this operation has been performed on account of uterine cancer obstructing labor at, or near, the full term. The explanation may possibly be this: That after the removal of the fœtus through an incision into the healthy uterus, two opposite processes—as first pointed out by Dr. West—are called into play. The one action consists in the rapid removal and disintegration of the uterine tissue; the other, in the repair of the wound which has been made by the surgeon. It is difficult to understand how two such antagonistic operations can take place, in the same organ, at the same time. But where the uterine walls are diseased, when perhaps owing to cancerous infiltration the normal process of fatty degeneration after labor is impeded or prevented,

then it seems by no means improbable that the action of repair may go on unimpeded. In such a case, the uterus when emptied of its contents contracts firmly; and as under this force the edges of the wound must be compressed together, the process of union seems a comparatively simple act.

12. The effect of *syphilis* upon the course of gestation has been so fully discussed in the chapter on abortion, that only a few words need now be added on the subject of treatment. On this head then it may be said positively that the use of appropriate remedies must not be postponed until after delivery. Syphilis is the disease of all others which is most likely to produce death of the fœtus and miscarriage; while I entertain no doubt whatever, but that the proper treatment is in a certain degree harmless.

In the case of primary sores the inunction of small quantities of mercurial ointment, night and morning, or less frequently, according to circumstances, until the mouth is gently touched, will produce the most beneficial effects; while if gestation be not advanced beyond the end of the sixth month, the cure may safely be hastened by the simultaneous employment of the mercurial vapor bath. For the removal of secondary or constitutional syphilis I have great faith in the perchloride of mercury, in doses of one-sixteenth to one-eighth of a grain, thrice daily. The only inconvenience attached to the use of this remedy is the length of time for which it is necessary to persevere with it. Except in the advanced periods of pregnancy the mercurial vapor bath can also be advised in these instances.—One hint more may prove useful. The accoucheur has occasionally to attend a woman in labor who is suffering from primary ulcers on the genitals. To save the infant in its passage and himself in his manipulations from infection, he should touch each sore thoroughly with the solid nitrate of silver; so as to give it a temporary impermeable coating, or to alter the secretion on its surface. For his own greater security also, I would advise him either to wear an oiled-silk glove, or to adopt my own practice and paint the hand with the officinal flexible collodion. By this last means a kind of elastic artificial cuticle is formed, which is impermeable to fluid until it cracks; and this it will not do for some few hours, if only moderate care be taken.

13. This chapter would be incomplete without a few words on

the epidemic and infectious maladies which may complicate pregnancy. It is probably in reference to disorders of this class that Hippocrates says in one of his aphorisms that acute diseases are fatal to pregnant women. However this may be, the remark is still often made that during widespread epidemics, a smaller relative proportion of pregnant women have been attacked than of others; but that when they suffer, they do so very severely. Gardien positively expresses this opinion, for he says—"Les femmes enceintes sont moins exposées à gagner les maladies contagieuses, mais lorqu'elles en sont atteintes, elles succombent plus promptement."[1] This proposition is not altogether true. For example, in the epidemics of influenza, pregnancy formed no barrier to its invasion; and the disease ran its course in the ordinary way, being neither more nor less severe than usual. The same remark applies to cholera; with the exception that it very often, as has been already mentioned, produces abortion. M. Bouchut, in analyzing fifty-two observations made upon pregnant women attacked with this disease, shows that twenty-five aborted in consequence. Of these twenty-five women, sixteen recovered; while of the twenty-seven who did not miscarry, only six recovered. But it must be noted that, of the women who recovered after aborting, only four had the disease in a rapid and dangerous form; while in the twenty-one who died undelivered, the disorder was short and severe, so that it may fairly be said there was scarcely time for the uterus to expel its contents. Apparently unmindful of this circumstance, M. Devilliers, Jr., has argued that abortion produces a favorable effect upon the termination of cholera; and he has consequently recommended the provocation of miscarriage as a means of diminishing the fatality of this disease.

The eruptive fevers are all particularly dangerous to women who have been recently delivered, whether the labor have been premature or at the full term. A patient attacked with smallpox, measles, scarlet fever, or erysipelas within one week of the birth of her child will rarely recover. The occurrence of either of these diseases during pregnancy is less to be feared. Often the fever runs a natural course, as if there were no complication. By no means as a rule is abortion induced; though when it hap-

[1] Traité Complet d'Accouchemens, et des Maladies des Filles, des Femmes, et des Enfans. Deuxième Edition. Tome ii, p. 29. Paris, 1816.

pens the case assumes a somewhat more serious aspect. Probably small-pox is the most to be dreaded of this class of disorders; the confluent form appearing to be uniformly fatal to the fœtus, and not unfrequently to the parent. If the discrete variety occur towards the end of gestation, the child will often be born alive; while it may also be healthy, or the body will be already covered with variolous pustules, or the poison may be incubating so that the disease will appear a few days after birth. The fact has been already alluded to that a pregnant woman may be exposed to the contagion of variola, and, owing to her system being protected by vaccination or by an attack of the disease at a former period, she can escape unharmed; the fœtus in utero alone suffering. So if she be pregnant with twins it has happened, that while one fœtus has become affected with this eruptive fever, the other has escaped. A pregnant woman residing in a district where small-pox is prevalent, should be vaccinated or revaccinated. This is advisable, partly to lessen the risk to herself; but particularly because there is reason to believe, that the protective influence of vaccination, successfully performed during the time of gestation, extends to the fœtus.

Dr. Montgomery believed he had seen sufficient to satisfy him that pregnancy does, at least occasionally, prevent or delay the development of infectious disease until after parturition, although the infection may have been previously caught. In his work (p. 44) there are related three corroborative examples. Thus:

Mrs. W., when in the ninth month of pregnancy, was much about her brother, who was dangerously ill of malignant scarlet fever. She seemed to have escaped the danger completely; but the day after delivery she was covered with the disease, and in a few days died. Between the time of her exposure to the contagion and the delivery, there had intervened three weeks; during which time she appeared to be quite well.

Again, a Mrs. F. was in the eighth month of pregnancy, when she assiduously attended upon her husband, who was suffering from typhus fever. After his recovery, she went to her father's house, some fifty miles from town, where she was delivered in due time; but immediately after labor she was seized with typhus fever, of which she died in eight days. Between five and six weeks had elapsed from the time of Mr. F.'s illness to her labor, during which interval she appeared in perfect health.

The third case was one of erysipelas, occurring in a young lady who was delivered on the 12th November, 1854, after a favorable labor. Previous to the birth of the child she complained of soreness of the abdomen, which afterwards persisted. On the 14th, the insteps of both feet were covered with well-developed erysipelas, and the abdominal pain then began to subside, and in two or three days quite ceased. Dr. Montgomery was informed that

some weeks before leaving home to visit Dublin for her confinement, her husband had a severe attack of erysipelas, during which she had constantly nursed him. Dr. Montgomery was of opinion that this lady caught the infection from her husband during her close attendance upon him, that it remained in abeyance until gestation was over, and was then developed. She recovered well.

Only the first of the three foregoing cases is remarkable. And too much importance must not be attached to this history; for it is by no means improbable that the poison was not derived from the brother at all, but that subsequently Mrs. W. got exposed to the influence of the disease without her knowledge. At all events we know that the period of incubation in scarlet fever varies from four to six days; and as this period has certainly not been lengthened in some instances, I do not think it likely that it was prolonged in Dr. Montgomery's patient. Moreover, as I have seen pregnant women attacked with small-pox after the usual latent period of twelve days, and have not met with any case where it could be supposed that the development of the fever was delayed by pregnancy, so my feeling of incredulity becomes strengthened. With regard to the cases of typhus fever and erysipelas our knowledge of the length of the period of incubation is too imperfect to make the cases cited of any importance.

14. In concluding this chapter with some general observations on *the therapeutics of pregnancy*, I shall be as brief as the nature of the subject will allow. And at the outset it must be said, that whatever may be the nature of the disease coexisting with gestation, the treatment should be mild and simple; heroic remedies, at least under these circumstances, being usually unadvisable. The efforts of the physician must be directed rather to putting the patient into the most favorable condition for bearing the brunt of the disease, than to cutting short the morbid action. Attention to all the laws of hygiene is especially demanded. The regulation of the sick-room ought not to be disregarded. The strength is to be supported by such food as the digestive organs can assimilate. And then, the practitioner, divesting himself of the trammels of routine, must freely consider his patient's case from every possible point of view; giving due weight in summing up his evidence to her age, temperament, habit of body, vital power, and the duration of the disorder. He may

likewise advantageously bear in mind the season of the year, and the nature of the prevailing epidemics. In this way he will be putting himself in a position to quietly and cautiously aid the curative processes; being unalarmed, even though he find after making his diagnosis that the scientific term for the disorder he has to cope with ends in that wretched dissyllable *itis*.

The history of medicine teaches us that the ancients almost prohibited *bleeding* during pregnancy; since they argued that every ounce of blood taken away from the mother was so much nourishment lost to the child. But there is undoubtedly a fashion in therapeutics; for about the beginning of the sixteenth century an abrupt reaction took place, and healthy pregnant females were then freely subjected to phlebotomy, merely because they were pregnant. In the last century, the French practitioners especially, bled almost every woman so soon as she became with child; repeating the operation when she had gone half the term, again at the latter period of gestation, and a fourth time when labor came on. In the present day a physician who ordered a pregnant woman to lose blood would run a considerable chance of forfeiting the confidence of his patient; for it is certain that neither the bulk of the profession nor the public have now much faith in the curative powers of bloodletting. About this fact it seems to me there can be no dispute. It may possibly be shown that the dislike to bleeding is carried too far; but that there is such a reluctance cannot be contradicted. The probable quantity of blood in the human body has been variously estimated by different physiologists: until lately it would appear that the estimate formed has been much too high. According to some recent and trustworthy investigations by Welcker, the body of an adult healthy male will probably contain about ten pounds of blood. To read, however, of the terrible bleedings which were formerly practised, one would think the blood constituted one-fourth of the weight of the body, instead of one-fourteenth. The lancet was not only the remedy *par excellence* for a large number of diseases, but occasionally even the instrument by which a diagnosis had to be made. The abuse of a weapon, however, can afford no argument against its use; and therefore it is necessary to see if there are any good reasons for discarding the practice of general bloodletting in the intercurrent diseases of pregnancy. Although it may be allowed, that in some few cases women suffer from a

state of plethora during the term of utero-gestation, yet I am sure that generally the reverse is the case. This latter remark is perhaps more particularly true of the inhabitants of large cities; many of whom are either weakened by the ills which belong to poverty and a residence in unhealthy localities, or are enervated by luxurious and idle habits. Mauriceau has termed pregnancy a disease of nine months. Without exactly indorsing this view, it may certainly be said that it is not a time of excess of health. The irritable condition of the nervous system, which is so common, is alone a proof of this. Moreover, though it is unnecessary to lay much stress upon the changes which the blood—as has been already pointed out—undergoes in its composition, yet it may be observed that all chemists who have recently investigated the question allow that the red globules diminish from the beginning to the end of pregnancy; and we know that bleeding, in all instances, especially tends to lessen the proportion of these elements. If to these points be added the proposition laid down by Dr. Todd—"That the notion so long prevalent in the schools, that acute disease can be prevented or cured by means which depress and reduce vital and nervous power, is altogether fallacious,"[1] I think we shall have sufficient evidence to make every practitioner pause before opening the vein of a pregnant female. Of course I am not here speaking of the relief of local congestions by topical bloodletting. I believe, for example, that excessive congestion of the uterus is a not unfrequent cause of some of the special diseases of pregnancy, and that it may be best relieved by the application of two or three leeches occasionally to the lips of the womb. But this is quite beside the present question, and indeed is merely referred to in order that my meaning may not be misunderstood.

There is one other consideration of some weight which suggests itself before leaving this subject, and it is this,—that bleeding may possibly, by inducing syncope, cause the death of the fœtus. The following case related by M. Depaul offers a good illustration of the truth of this statement:

A young woman in the sixth month of her second pregnancy applied to Dr. Depaul to be bled, as she stated that she suffered from giddiness and severe headache. Relying on these statements and on the condition of the

[1] Clinical Lectures on Certain Acute Diseases. Preface. London, 1860.

pulse, this gentleman thought the loss of blood would be beneficial; and after having assured himself by the practice of auscultation that the fœtus was alive, he bled her. Having withdrawn ten ounces of blood, the vein was about to be closed, when the patient fainted; the state of syncope being so complete that for some moments the respiration and circulation seemed completely suspended. She was taken from the chair on which she had been sitting and placed in a horizontal position; but although the usual remedies were applied, twenty minutes elapsed before the circulation had resumed its normal rhythm. From this time the active movements of the child ceased to be felt; and five weeks afterward she was delivered of a dead child, which it was concluded—from its condition—had died at the period of bleeding.

The following year this woman again became enceinte, and when the pregnancy had advanced to the end of the sixth month she once more applied to be bled for the relief of giddiness and headache. The bleeding, practised under the same conditions, was followed by the same accident. She fell into a perfect swoon; and on recovery the fœtal movements had ceased, while the pulsations of the infant's heart, which had been previously heard, could not now be detected. Some weeks afterwards she was delivered of a dead child. This second unfortunate result, together with the history of the case, made M. Depaul seek for further information; and all he learned forced him to the conclusion that the woman on the second application had simulated her headache, &c., in order that she might be bled with the same result as on the first occasion.[1]

The employment of *cathartics* or *purgatives* in the transitory disorders of pregnancy next demands attention. Medicines of this class are chiefly used to remove the contents of the alimentary canal, to diminish the quantity of the fluids of the body by promoting secretion and exhalation from the intestinal surface, to excite the liver and pancreas to increased action, and to affect remote organs on the principle of revulsion. As a rule, different purgatives act on different portions of the intestinal canal; and our object must be to employ such as principally affect the duodenum and other small intestines, rather than those which irritate the rectum. Hence aloes, scammony, gamboge, colocynth, and hellebore had better be avoided; while all drastics, such as croton oil or elaterium, prove very injurious. There can, however, be no harm in having recourse occasionally to castor oil, rhubarb, taraxacum, purified ox bile, and the salts of soda or potash, or to enemata of warm soap and water, gruel and oil, &c. Senna is one of the drugs in common use which is generally considered harmless; but I am sure that I have seen it do mischief when administered during pregnancy, or when uterine disease has existed. Such an effect is not suprising when we

[1] Traité Théorique et Pratique d'Auscultation Obstétricale, p. 269. Paris, 1847.

remember that this agent stimulates the pelvic vessels, and has a tendency to promote hemorrhoidal and menstrual discharges. Where active cathartics are deemed necessary, calomel or jalap may be used, since they especially excite the action of the duodenum, and promote the discharge of bile.

Diaphoretics are valuable remedies, to which the obstetrician may freely resort. To insure the action of the medicines of this class, diluents—as tea, thin gruel, whey, and cold water—must be freely given; while external warmth ought to be carefully applied. In the early months of pregnancy the hot water or vapor bath may be prescribed without any fear of producing abortion; but after the sixth month I should scarcely venture to order these agents without some particular reason.

When *narcotics* or *sedatives* are given habitually to pregnant women, they are said to exert an injurious effect upon the fœtus in utero. But this circumstance is not to prevent our cautiously using medicines of these classes, where they are called for by the presence of disease. To procure sleep, to allay pain and spasm, to diminish vascular and nervous excitement, and to arrest excessive secretion, it is often indispensably necessary that hyoscyamus, camphor, belladonna, conium, hydrocyanic acid, ether, chloroform, or opium should be administered. In prescribing any of these drugs it is to be remembered that women are generally more susceptible to their influence than men; and that where there is much debility, with a disposition to miscarriage, great caution will be requisite, since some of them may then excite delivery.

Counter-irritation is resorted to in a large number of diseases, and not very uncommonly without doing the slightest good. Routine practitioners are especially fond of blisters; but these disagreeable agents should be but seldom employed under the circumstances we are now considering. If it be certain that counter-irritation is needed, sinapisms and turpentine stupes and dry cupping will generally accomplish as much good as vesicants, or those substances (tartar emetic and croton oil) which produce pustular eruptions.

Tonics and *stimulants* may be employed in the intercurrent diseases of pregnancy almost in the same way that they are ordinarily used; always excepting the various preparations of steel, which, as a rule, are best avoided.

Amongst the classes of medicines which should be avoided I would place *emetics*, *diuretics*, and it need scarcely be said *emmenagogues*. Of course a certain latitude must be allowed in acting upon these observations; since it is only possible to give here general rules and hints. Particular cases will occasionally happen, where the principles which have been inculcated must be departed from. But the enlightened physician, who treats disease according to the condition of his patient and the precise nature of the morbid actions going on in her system, rather than in conformity with a mere nosological arrangement—a system in which each disorder has its appropriate remedy—will have little or no difficulty in understanding the extent to which he is to follow the foregoing landmarks.

CHAPTER X.

THE SYMPATHETIC DISORDERS OF PREGNANCY.

SECTION 1.—DISORDERS OF THE DIGESTIVE ORGANS.—1. INTRODUCTION.—2. CAPRICIOUS APPETITE.—3. TOOTHACHE.—4. SALIVATION.—5. NAUSEA AND VOMITING.—6. CARDIALGIA.—7. HÆMATEMESIS.—8. DIARRHŒA.—9. CONSTIPATION.—10. JAUNDICE—HEPATIC HYPERTROPHY—ACUTE ATROPHY OF THE LIVER.

SECTION 2.—DISORDERS OF THE ORGANS OF RESPIRATION AND CIRCULATION.—1. DYSPNŒA.—2. COUGH.—3. HÆMOPTYSIS.—4. PALPITATION OF THE HEART.—5. FAINTING.—6. ENLARGEMENT OF THE THYROID GLAND.—7. MORBID CONDITIONS OF THE SPLEEN.—8. VARICES—HÆMORRHOIDS—THROMBUS, OR SANGUINEOUS TUMOR FROM THE RUPTURE OF THE ENLARGED VAGINAL VEINS, ETC.

SECTION 3.—DISORDERS OF THE NERVOUS SYSTEM.—1. CEPHALALGIA.—2. SLEEPLESSNESS.—3. HYPOCHONDRIASIS.—4. NERVOUS AFFECTIONS OF THE EARS AND EYES—AMAUROSIS.—5. MASTODYNIA.—6. PAIN OF THE RIGHT SIDE—MYALGIA.

SECTION 1.—THE DISORDERS OF THE DIGESTIVE ORGANS.

1. INTRODUCTION.—Every physician who has devoted much attention to the study of uterine diseases is aware that they give rise to a great number of sympathetic disorders. From the first catamenial period to the last, even when the menstrual function is performed naturally and painlessly, the excitement of the sexual organs produces a marked effect upon the whole system. It is scarcely surprising, therefore, that the wonderful changes which result from fecundation should considerably influence all the vital functions.

The effects induced by pregnancy vary very much in different women. With some constitutions the peculiar excitement which arises has only a directly beneficial influence; causing all the organs to act harmoniously and efficiently, and thereby producing a more healthy condition than usually exists at other times. In many cases, however, more or less troublesome symptoms are experienced. These are sometimes so slight as merely to produce a general feeling of discomfort; while sometimes they are so grave as materially to injure the general health, even if they do not endanger life.

The disorders of pregnancy arise chiefly from three sources,—viz., from the important changes going on in the uterus producing sympathetic influences and derangements in distant viscera; from the pressure of the enlarged uterus upon the parts near to or in contact with it; and from morbid states of the sexual system. The amount of sympathetic irritation excited in different organs varies much in different women; and unless excessive, must not be regarded as unnatural. "It is a popular observation, confirmed by experience,"—says Denman—"that those women are less subject to abortion, and ultimately fare better, who have such symptoms as generally attend pregnancy, than those who are exempt from them. The state of pregnancy is then an altered, but cannot with propriety be called a morbid state. But if the term *disease* be used on this occasion, with the intention of giving a more intelligible explanation of the temporary complaints to which women are then liable, or to denote their irregularity, or an excessive degree of them, it may be retained."[1] No organ sympathizes more extensively with the uterus than the stomach; and hence one of the earliest symptoms of pregnancy is derangement of the functions of this viscus. Dyspepsia is the precursor of disordered nutrition; for how can the "life of the flesh" escape deterioration when the material from which it is formed is imperfectly elaborated? When it is remembered, that the corpuscles naturally become diminished and the watery portion of the blood increased, so soon as the system has to supply materials for the development of a new being, it can be easily understood how that which was at first a purely sympathetic disorder at length becomes converted into a troublesome disease. The chlorotic condition to which the pregnant woman thus gets reduced, partly explains many of the symptoms —*e. g.*, headache, vertigo, palpitation, dyspnœa, and general feebleness—from which she suffers at an advanced period of gestation. And it is obvious, that such symptoms must become aggravated by any lowering treatment; while they can only be lessened by animal food and milk and wine, with tonics and similar remedies.

The corollary from these observations seems in part at least to be, that great attention should be paid to the *diet* of pregnant

[1] Introduction to Midwifery Sixth Edition, p. 126. London, 1824

women; which—while it is to be simple and light and nutritious—ought to be specially adapted to the requirements of the particular individual, and the condition of her digestive organs. In the way merely of a few common suggestions it may be said, that improper indulgences in food are not to be sanctioned; that highly-seasoned or very rich dishes are bad; that tea and coffee are to be used only in moderation, and in a great measure as vehicles for cream or plenty of milk; and that alcoholic stimulants are by no means always, nor perhaps even generally, necessary. It is often erroneously thought that an unusual supply of nourishment is required during pregnancy to support the strength and aid the development of the fœtus. Consequently, either an increased amount of food is taken, or a change is abruptly made from a plain and nourishing regimen to full and generous living. Both of these errors are to be avoided. For by their adoption we either give rise to a state of plethora, as injurious to the mother as to the embryo; or we produce debility and dyspepsia and nausea and heartburn, &c., in the former, and in the latter constitutional feebleness. No argument is necessary to prove, that the consequences must be the same to the infant, whether the insufficient nourishment of the maternal system results from want of food or from inability of the stomach to digest it. The fact seems often forgotten, that to allow an abundance of nitrogenous food and stimulants is not always to impart permanent power or even necessarily to give temporary strength; for how can healthy nutrition result if the digestive functions are taxed beyond their powers,—if more food be eaten than can be properly digested and assimilated? Where the digestive powers are good, however, and eating is not followed by oppression or languor, there can be no harm in satisfying the appetite with such food as the patient may be accustomed to, and which she knows from experience agrees with her. As a general rule, milk and cream, lightly cooked and raw eggs, fish, poultry, mutton, beef and game may be beneficially partaken of; remembering that not only is variety in diet very important, but also that it is necessary so to regulate the time of the different meals that the stomach can enjoy proper intervals of rest. A too spare diet is, on the other hand, no less injurious and reprehensible. Unhappily, however, it cannot always be avoided. During "strikes" and hard times many of the wives of the laboring classes suffer much

from their inability to procure a due supply of wholesome food. In consequence, they give birth to feeble and unhealthy children; who grow up stunted in growth and deficient in both mental and bodily vigor, unless they prematurely perish from some form of tuberculous disease.

With delicate women it will sometimes be found advantageous to advise them as to the nature of the *water* they should drink. Hard water, or that which contains much lime and magnesia and iron and sulphur, is no doubt injurious to the coats of the stomach of many an invalid. The owners of racehorses are so well aware of the importance of attention to this matter, that when the animals are sent away from their stables to Epsom or Goodwood, &c., the soft water to which they have been accustomed is often forwarded with them; for a trainer would no more allow "the favorite" to have one drink of hard water when stabled on the chalky downs, than he would let him remain a single day without his gallop or without the most thorough grooming. Where there is very great irritability of the stomach in pregnant women small quantities of icy cold distilled water can sometimes be taken, when the fluid direct from a spring will not be tolerated. That which irritates the skin can hardly be expected to soothe a mucous membrane. Now, for very fine skins pure soft water is *seen* to be much better for use than that which is hard and coarse. Indeed, no cosmetic will be required by the lady who washes in distilled or in pure rain-water; or even in water which has been well boiled and filtered, provided that the impurity is due to the presence of carbonate of lime. Whereas, however, all waters from the chalk—which hold carbonate of lime in solution—may be softened by boiling, those which are hardened by sulphate of lime are rendered still harder by this means, to an extent proportionate to the amount of the evaporation. It is not necessary here to allude to the injurious properties of bad water,—*i. e.*, that containing decaying animal or vegetable matter, or that which is rendered noxious by exposure to the effluvia from drains, or which is poisoned by contact with lead—because we are all well aware of the absolute necessity for prohibiting the use of such dirty solutions of pestiferous matter. Since the mortality returns of 1849 and 1854 unmistakably proved that a great excess in the deaths from cholera occurred wherever bad water was supplied,

any inattention to this point for the future would be almost unpardonable.

About the year 1850, M. Depaul revived the consideration of the question as to the possibility of partially arresting the development of the fœtus by almost starving the mother; so that, without injuring its health, or shortening its intra-uterine existence, the child when born might be small so as to pass through a contracted pelvis. This gentleman relates two cases in favor of his view that such a proceeding may sometimes be advantageously resorted to. From these instances, as well as from a general consideration of the subject, he draws the following conclusions:

(1) That bleeding and a low diet have an undeniable influence on the development of the child during its intra-uterine existence. (2) This plan can be adopted in malformations of the pelvis, and be substituted in some instances for artificial premature labor. (3) It is applicable with no less advantage in those cases where, without a contracted pelvis, the extreme size of the fœtus has in preceding labors caused fatal difficulties. (4) The influence of a restricted diet, when the woman submits to it rigorously for a sufficient length of time, is much more efficacious than that of bleeding. The latter also cannot be often practised without compromising the pregnancy. (5) Bleeding should, however, be combined with a low diet. It is especially useful in the last months of pregnancy. (6) This plan, judiciously employed, has no unfavorable influence either on the progress of pregnancy, on the future health of the mother, or on the well-doing of the child. (7) It is impossible to lay down a rigorous formula for its practice, for it should be modified according to circumstances and the especial aim in view. And (8) the treatment should be resorted to early, and ought to be persevered with uninterruptedly till the end of pregnancy.[1]

Now the cases just alluded to of M. Depaul, those also related by M. Delfraysse,—who administered small doses of iodine with iodide of potassium during the last two months of gestation, with the same intent,—and one recorded by Baron Dubois in 1855, where scarcely any food was taken during the whole period of pregnancy, are all very good examples of that *post hoc ergo propter hoc* kind of reasoning which is so often met with in medical essays. Because a certain plan of treatment was adopted with the mother in some half-dozen cases, and the child when born was found to be small, therefore we are to admit the existence of cause and effect. But if these views of M. Depaul be sound, all the experience of daily life must be valueless. Ask

[1] L'Union Médicale. Tome iv, p. 22. Paris, 12th January, 1850.

the practitioners who attended the poor Irish women during the famine, if the infants were smaller than usual? Does not the union doctor deliver paupers, who have suffered great deprivations and anxieties, of children as large—though they may be constitutionally weak—as those who first see light in the mansions of the great? It has often been noticed that women who get thin during pregnancy give birth to the fine-looking children. In a case which was under my own care, the lady suffered severely from nausea and vomiting during the greater part of the nine months, so that she became quite attenuated and extremely feeble. Yet her labor was tedious and difficult owing to the size of the infant, which was found to weigh more than twelve pounds. Look again at the infants born from mothers in advanced stages of phthisis. Louis refers to the case of a woman whose lungs contained a great number of tuberculous cavities and who died in the last stage of marasmus, three weeks after having been delivered of an extremely robust infant. On the other hand, Denman asserts in his treatise, from which I have already quoted, that,—"If the mother has little uneasiness, and grows corpulent during pregnancy, the child is generally small." It seems unnecessary then to say more against M. Depaul's cruel proceeding. And, indeed, if we granted that the results obtained were as favorable as could be desired, still the practice could have nothing to recommend it in preference to the induction of premature labor at some time after the expiration of the seventh month.

2. Capricious Appetite.—Want of appetite, or even a complete disgust for food, is not uncommon during the earlier months of pregnancy; and when of long continuance gives rise to great weakness and emaciation. As the dislike is chiefly towards animal food, attempts must be made to nourish the system by fresh vegetables, ripe fruits, eggs, light nutritious puddings, and milk.

A more remarkable peculiarity is an irregular and depraved appetite, sometimes described under the name of "pica,"—probably from *pica*, a magpie, as this bird was supposed to live upon clay. There is usually a distaste for wholesome food. The longing for absurd or even disgusting articles of diet, is occasionally carried to such an excess as to constitute a species of monomania. The older writers seem to have taken a particular

pleasure in detailing all the longings of pregnant women which they could hear of; as well as in giving minute descriptions of the extent to which these caprices were carried. Hence the stories are numerous of daily meals made of chalk, brown paper, charcoal, clay, cinders, dirt of all kinds, ginger, broken pebbles, sealing-wax, slate-pencil, &c. Langius even mentions a woman, who—to gratify her extremely disagreeable desires—killed her husband, made a dinner off part of him while he was fresh, and then pickled the remainder.

In most cases of disordered appetite it will be found that the functions of the stomach are imperfectly performed, and that the secretions of this viscus are in a vitiated condition. If we examine the patient's tongue it is seen to be coated with a thick fur; the mouth is filled with viscid saliva; the breath is generally most offensive; and complaint is either made of pyrosis, or there are frequent eructations of an acid glairy fluid. Of course, with these symptoms there can only coexist bodily weakness and great mental depression. Consequently the physician's course is clearly marked out. Instead of pandering or giving way to the fancies of the patient, she must be taught the necessity for exercising a proper amount of self-denial; inasmuch as compliance with her whims only makes her more exacting. Attempts have to be made to impart tone to the digestive organs; and mild alteratives, laxatives, pepsine, and simple vegetable tonics may be administered according to the apparent requirements of the system. Opiates sometimes prove useful by allaying gastrodynia; while the preparations of bismuth are of great service where there is water-brash. All violent medicines, whether purgative or otherwise, are decidedly to be avoided; their exhibition being fraught with equal danger to both the mother and fœtus. The diet should also be bland and nutritious; soda-water or Seltzer or Vichy water, with ice, will be found grateful; exercise should be taken daily in the open air; and the patient's mind ought to be kept occupied by change of scene, by persuading her to mix in cheerful society, and by substituting healthy recreation for listlessness and undue self-indulgence.

3. Toothache.—Neuralgic pains in the dental nerves, especially in those of the upper jaw, are sometimes very troublesome. They are most common in the earlier months of gestation; but

occasionally frequent attacks of pain are experienced through the whole period of pregnancy. The suffering, however, is not always simply neuralgic; for acute caries of some of the teeth may occur, giving rise to severe paroxysms of torture night and day. Doubtless the existence of a decayed tooth prior to conception will predispose the patient to attacks of this kind.

In all cases the mouth should be examined. If the suffering be due to caries, and only one or two teeth are affected, they should be extracted; provided the patient is strong enough to bear the shock of the operation, if she is unwilling to allow an anæsthetic to be employed. It is, however, only in exceptional instances that there can be any objection to the inhalation of chloroform; or of what is better, a mixture of equal parts of chloroform and pure ether. But if the pains are neuralgic, it will be worse than useless to extract the teeth. Then we must trust to efficient laxatives, tonics, good diet with wine or beer, sedative fomentations, and the local application of chloroform. I have found quinine combined with the ammoniated tincture of valerian give lasting relief in cases attended with debility and nervousness. Sometimes, the liquid extract of yellow cinchona with phosphate or valerianate of zinc proves efficacious. In other instances, when the blood has been watery, the valerianate of iron, or the saccharated carbonate of iron, has done good. Sedatives are frequently needed to give temporary relief, and especially to prevent the mischief which arises from a series of restless nights. Under these circumstances, a mixture of ether and opium and Indian hemp may often be prescribed with advantage. But where the distress is very great, the subcutaneous injection of a quarter of a grain of morphia, dissolved in two or three minims of distilled water, will give more rapid and sure relief than when the same drug is exhibited by the stomach. I do not think any advantage is gained by using the injection at the seat of pain, while it is certainly sometimes inconvenient to do so. Some authorities, however, have entertained a contrary opinion. For example, Dr. R. H. Storer has recorded the following case:

A lady suffered for several weeks from severe neuralgic pain throughout the left half of the upper jaw. The pain was at times of a lancinating character, and at others dull. The general health was decidedly affected, as evidenced by the state of the circulatory, digestive, and nervous systems. The teeth were all sound; and there was no heat or swelling of the gums, nor

increase of pain on pressing them. Anodynes, refrigerants, emollient poultices, and counter-irritants were successively resorted to without benefit. After much solicitation, a tooth was extracted; but the patient remained unrelieved. On the following day, ten drops of a solution of bimeconate of morphia were injected beneath the mucous membrane of the gum. The pain ceased instantaneously, and it may be said permanently; inasmuch as it had not returned at the end of five months, when the case was reported.

4. Salivation.—Hippocrates, and many writers since his time, have mentioned the occasional occurrence of salivation as a sign of pregnancy. Mauriceau alludes to increased spitting as a common symptom of pregnancy. Dewees says that almost all women have more than an ordinary quantity of saliva during utero-gestation. When salivation happens, it generally commences at an early period; and either ceases about the end of the third month, or persists during the whole term of gestation. In a few rare instances it has continued for one or two months after delivery.

The salivary glands are usually found swollen and tender; the buccal mucous membrane being also tumid and congested. But the gums are neither sore, spongy, nor ulcerated; and there is no fetid odor from the mouth, as there is to such a marked extent in mercurial ptyalism. The amount of saliva secreted may vary from a slight increase of the natural quantity, to three or four quarts in the twenty-four hours; the fluid is tenacious or thin, and often has a rather unpleasant taste; and the excessive flow of it at night gives great annoyance, owing to the necessity for frequently emptying the mouth. In the few cases which I have seen, the patient has suffered from troublesome constipation; and the stomach has been weak and irritable, giving rise to a frequent sense of nausea with other dyspeptic troubles. The ill-effects which sometimes ensue are well seen in the following characteristic case, recorded by Dewees. This author says:

I was called upon to prescribe for Mrs. J——, who was advanced to the fifth month of her pregnancy. At the second month she was attacked by a profuse salivation; she discharged daily from one to three quarts of saliva, and was at the same time harassed by incessant nausea and frequent vomitings: so irritable was the stomach, that it rejected, almost instantly, anything that was put into it. She now became extremely debilitated—so much so as to be unable to keep out of bed; and when she did attempt to sit up, she would almost instantly faint, if not instantly replaced. From a belief that the affection might be local, astringent gargles were freely employed, but with marked disadvantage. A large blister was next applied at the back of the neck, with decided but transient benefit—that is, the salivary discharge

was less, the nausea diminished, and the vomiting became less frequent; but this favorable impression was but of three or four days' duration; for after this time all the unpleasant symptoms returned with their former severity. An emetic of ipecacuanha was now exhibited, followed by a cathartic of rhubarb and magnesia, without the smallest benefit; soda-water, lime-water and milk, milk itself, &c, were in turn unavailingly employed. I now put my patient upon a strictly animal diet, and ordered ten drops of laudanum morning and evening, and fifteen at bed-time: this plan succeeded most perfectly in the course of a few days; nausea and vomiting ceased, and the discharge was reduced to less than a pint *per diem;* and perhaps the force of habit had no inconsiderable agency in the production of this quantity. The bowels during this plan were kept open by the extract of butternut and rhubarb, in the form of pills. The lady never had any return of this complaint in her subsequent pregnancies.[1]

Many patients are not as fortunate as Mrs. J. with regard to the non-return of the symptoms in subsequent pregnancies. On the contrary, it will often be found that the same phenomena recur again and again. I know of one case where the first appreciable symptom of pregnancy is salivation, which always continues until after quickening.

The treatment of this affection demands a little caution. According to some foreign writers the discharge ought not to be suppressed, as the cure of it has been followed by apoplexy. Our fears upon this point need not deter us, however, from attempting to restrain the secretion when it is evidently deranging the digestive organs and weakening the patient. The first point is to attend to the functions of the bowels, a course of cooling laxatives being always necessary. The application of small blisters to the neck, or behind the ears, then appears more calculated to do good than any other single remedy; and it has seemed to me advisable to prevent the raw surfaces from healing for some short time by the use of irritating ointments. Local applications to the mouth are seldom of use; but inhalations of the officinal vapors of conium or of creasote cannot prove at all injurious. If any gargle is likely to do good, one containing borax is the most promising in my estimation. The following might be ordered experimentally:

Take of,—Glycerine of Borax, 2 fluid ounces; Rose-water, 6 fluid ounces. Mix for a gargle. To be used twice or thrice daily.

Sucking Wenham lake ice gives temporary relief, and is grateful

[1] A Treatise on the Diseases of Females. Tenth edition, p. 201. Philadelphia, 1854.

to the patient unless her teeth are decayed. With regard to medicines capable of acting directly upon the discharge, it can only be said that none are known the effects of which are certain. I think I have seen belladonna do good; either when taken internally, or applied over the region of the submaxillary gland. I have tried the officinal arsenical solution, but as far as can be remembered only in one instance with benefit. Chlorate of potash, according to the following formula, might perhaps be useful:

Take of.—Chlorate of Potash, 90 to 120 grains; Liquid Extract of Yellow Cinchona, 90 minims; Tincture of Hyoscyamus, 4 fluid drachms; Camphor Water, to 8 fluid ounces. Mix and label,—"One-eighth part, with a large tablespoonful of water, every six or eight hours."

It need only be further remarked that the irritability of the stomach, which appears sometimes to be the result of the ptyalism, will necessitate attention to the diet; and therefore the rules which have already been laid down upon this subject have to be attended to. The confession must also be made, that not unfrequently all our efforts to check the secretion will only end in disappointment.

5. Nausea and Vomiting.—These sympathetic disorders are so common, that there are few women who do not suffer from them during one stage or other of gestation. But it must be remembered, that independently of pregnancy, vomiting is very frequently witnessed in certain diseased conditions of the sexual system. Thus morning sickness is occasionally troublesome in dysmenorrhœa, in amenorrhœa, as well as when the catamenia get irregular at "the change of life;" it very often increases the prostration of the sufferer and hastens death in carcinoma uteri; and I have repeatedly seen it present in simple irritation of the ovaries, in acute and chronic ovaritis, in endometritis, in pelvic cellulitis, as well as in peri-uterine hæmatocele. La Motte refers to a non-pregnant woman who vomited "solâ actione coitûs;" and to two others who had violent sickness at each catamenial period.[1]

The phenomenon under consideration, when it occurs in connection with pregnancy, may present itself during the first twelve

[1] De Arte Obstetricâ, pp. 54 and 75. Lugd. Batav., 1733.

or sixteen weeks of gestation, or throughout the whole term, or merely for the two or three latter months. In the first case it usually sets in about the end of the third or fourth week, though occasionally it begins within a day or two of conception. It is generally assumed, but I know not with what degree of correctness, that primiparous females suffer more frequently from vomiting than others; owing to the uterine tissues being more unyielding in first pregnancies than they afterwards become. So also some women assert that they only have sickness when the fœtus is of the male sex; a circumstance which they confess their inability to explain, save by the feminine argument "that it is so." The attacks of retching, in mild cases, give but little pain or fatigue; though in more severe instances there is often exhaustion and considerable epigastric tenderness. It is not to be forgotten that, in the great majority of cases, the stomach itself is healthy; the sickness being caused by reflex irritation from the gravid womb.

Speaking with some degree of latitude, it may be said that the stomach only appears to be irritable during the early part of the forenoon; so that the patient, on rising from her bed, feels oppressed with nauséa and usually makes an effort to vomit. From this peculiarity, the attacks are often spoken of as "morning sickness." The matters ejected consist chiefly of a glairy mucus, mixed with a quantity of acid water; a little bile being sometimes present. When the attack comes on after a meal, of course the food is returned. The sickness does not take away the appetite for breakfast, and frequently the nausea does not return until the following day; the attacks, perhaps, ceasing entirely at the end of six or eight weeks, though ofttimes they continue until the period of quickening.

Unfortunately, it must be confessed that deviations from this ordinary type are not very rare. Every physician meets with instances where the irritability of the stomach is so extreme, that directly any kind of food, or even plain water, is taken, it is rejected. In such cases the absence of all nutrition must lead to symptoms which are very formidable. The patient soon becomes feeble and exhausted; while there is daily increasing emaciation, the wasting sometimes going on to an extraordinary degree. The least exertion threatens to produce deadly syncope. There is much suffering with uncontrollable restlessness; the counte-

nance assumes an anxious expression, though many times no manifestation of fear is apparent; the eyes get sunken while the cheeks fall in; and there is an offensive sour odor in the breath. Unless amelioration occur, which may sometimes suddenly happen when matters appear nearly at the worst, a perfect loathing of all food and drink seems to set medical skill at defiance. Violent epigastric pains torment the sufferer; and the retchings often persist, though the stomach be empty. The weakness is extreme. At times there is disordered vision with hallucinations; while the system rallies and sinks again and again in the course of a few hours, like the flickering flame of a nearly burnt-out taper. But one step more, and a fatal result ensues; the victim either dying from sheer starvation, or from the rupture of a bloodvessel during a violent fit of vomiting, or from a paroxysm of convulsions. Even to the last, however, the mind is often supported by the hope of relief; and repeatedly the intellect remains perfectly clear till death closes the scene. Numerous fatal cases are recorded, but I know of no author who has had the misfortune to meet with so many as Baron Dubois; who stated, during a discussion on this subject at the French Academy of Medicine in 1852, that in the course of thirteen years he had met with twenty in his own practice.[1]

M. Dance is of opinion that when, during pregnancy, vomiting is protracted beyond the ordinary period, it usually arises from a morbid irritation of the uterus, which, together with the membrana decidua, is in a state of inflammation. He has had an opportunity in two cases of testing this opinion by post-mortem examinations. In the first of these the uterine parietes were found thinned to almost a line and a half, soft and gorged with blood: in the second, there was discovered pus and layers of coagulable lymph between the decidua and internal surface of the uterus, with other symptoms of inflammation. He recommends the employment of decided antiphlogistic measures, applied as near as possible to the uterus, and not to the stomach, which is only sympathetically affected.[2] But inasmuch as cupping, leeches, blisters, and similar remedies were used in these instances without the slightest benefit, the propriety of following M. Dance's advice may not unreasonably be called in question.

[1] Ranking and Radcliffe's Half-yearly Abstract of the Medical Sciences. Vol. xvi, p. 367. London, 1853.

[2] Medico-Chirurgical Review. New Series. Vol. viii, p. 149. London, 1829.

According to Dr. Henry Bennet, the discovery of the frequent existence of inflammatory ulceration of the neck of the uterus during pregnancy is one of vital importance, inasmuch as it affords a ready explanation of most of the accidents and morbid symptoms of this period. From repeated investigations he has ascertained that this condition "is of frequent occurrence, that it is the keystone to the diseases of the pregnant state, and the most general cause of laborious pregnancy, obstinate sickness, moles, abortions, miscarriages, and hemorrhages."[1] The inflammatory ulceration of the cervix will generally be found, on inquiring into the history, to have existed prior to the pregnancy; for though this state is constantly the cause of sterility when it attacks young married females at the onset of their married life, yet it does not seem so uniformly to prevent conception in those who have previously had children. The symptoms it gives rise to are chiefly these: A continued and irritating pain in the lower part of the back, as well as in the abdomen, and especially in the ovarian regions; a feeling of aching or uneasiness down the inside of the thighs; a more or less copious muco-purulent vaginal discharge; a sensation of great pelvic weight and bearing-down; loss of appetite and strength and flesh; headache, palpitations, constipation, and troublesome sickness; with possibly a gradually-increasing exhaustion, which may bring the patient to the brink of the grave. On practising the touch, the ulcerated os uteri is found more open than is consistent with the period to which gestation has advanced; while the lips are soft, instead of being indurated as they are when the non-pregnant cervix is inflamed, and they have a velvety or even fungous pultaceous feel. The vulva and vagina are extremely red and congested; while on examining with the speculum, the cervix is seen to be voluminous and tumid and of a livid hue, as well as more or less covered with fungous granulations. The fungosity may be so great as even to give rise to a fear of malignant ulceration; while the surface bleeds readily, the hemorrhage being sometimes periodical so as to simulate menstruation.—The cure of all the foregoing symptoms is not very difficult. The chief remedies are free cauterization of the affected surface with nitrate of silver; or, in bad cases, the careful application about every four days of the

[1] On Inflammation of the Uterus: its Cervix and Appendages. Third edition, p. 158. London, 1853.

acid solution of nitrate of mercury. Benefit will arise from the use of solutions of alum and sulphate of zinc, or of the diluted solution of subacetate of lead, as injections. Then, with perfect rest, a light diet, and simple vegetable tonics, all will do well.

Dr. Clay, of Manchester, believes that when obstinate vomiting occurs during the latter months, it will very often be found due to considerable congestive inflammation and great tenderness of the os and cervix uteri. He relates three cases as bearing out his opinion. From them, as well as from his general experience, he deduces these observations, which I cannot do better than give in his own words:

> That the irritable state of the stomach is purely symptomatic of that condition of the os and cervix uteri (that is) in these obstinate cases of the latter months. That these cases differ widely from, and must not be confounded with, those of nausea and sickness of the early months, however severe; and where the stomach itself particularly, and in some measure the entire digestive functions are much deranged: and attention to the condition of the stomach will in most, if not in all cases, be remedied by medicine and diet. That diet or medicine have little or no effect in the severer cases above described, *in the latter months;* but that a position of the body calculated to relieve the os and cervix from pressure against the pelvic viscera, best accomplished by lying on the back with the hips raised and head low, with food in very small quantities given at long intervals. Lastly, and mainly, I rely on the application of a few leeches, applied through the speculum, direct to the os and cervix uteri, the seat of congestive inflammation, and consequently the cause of general irritation and sympathetic action of the stomach and its consequences. The leeches are to be repeated if any tenderness remains, and the position strictly observed until the symptoms are entirely conquered.[1]

In a few very rare instances, the attacks of vomiting are most troublesome when the patient is in the recumbent posture. In such, Dr. Clay suggests that there is some tenderness and congestion of the uterine structure at or near the fundus uteri; and he says that he has had one example of this kind, which was soon relieved by stupes of warm turpentine and water, together with the loss of a few ounces of blood from the arm.

There are, moreover, a few cases where the vomiting depends upon some displacement of the uterus, such as retroversion or anteversion, &c. In these a cure can be effected by replacing the womb in its normal position.

We must now return to the consideration of the treatment

[1] On the Severe and Obstinate Forms of Vomiting during the latter months of Pregnancy, p. 7. London. No date.

necessary for those examples of purely sympathetic vomiting from the state of pregnancy, where there is no morbid condition of the uterine organs; a class of cases which I believe to be far more common than any other. But first it should be observed that when the morning sickness is merely slight, medical interference will seldom be called for. Not a few practitioners consider this disorder to have a beneficial tendency rather than otherwise; and certainly with the public it is a common belief that women who do not suffer from it during the early months are very apt to miscarry. Dr. Bedford goes so far as to lay down this proposition:

> That there is a striking connection between the absence of all gastric irritation and miscarriage, is a fact about which I do not entertain the slightest doubt; and on this assumption I have predicated a treatment, which I am happy to inform you, has proved invariably successful. I could cite to you more than one instance in which miscarriage has occurred under these circumstances, and having been consulted in a subsequent pregnancy, in which the absence of nausea, &c., still persisted, I have been enabled to carry the lady to her full term, and deliver her of a healthy child. The treatment is extremely simple, and it is nothing more than an effort to assist Nature, and relieve the uterus from the effects of extreme congestion. I order the patient to take from one-quarter to half a grain of ipecacuanha once, twice, or thrice a day, as circumstances may indicate, for the purpose of producing nausea, thus simulating as nearly as possible the course pursued by Nature, when not contravened by influences which she cannot control. This course of treatment is continued until about the fourth month of gestation, at which time the nausea and vomiting usually attendant upon pregnancy, as a general rule, cease.[1]

Supposing that the nausea and vomiting are having an evidently injurious influence, as they frequently have, what is the course to be pursued? It may be answered that our purpose must be threefold. First, to remove all irritating matters from the primæ viæ, and promote healthy glandular secretion; secondly, to assist the action of the stomach by sedatives, tonics, and a carefully-regulated diet; and thirdly, other means failing and life being endangered, to remove the cause of the disturbance by emptying the uterus.

Attempts then must *first* be made to get the secretions of the stomach and intestines, liver and pancreas into a healthy condition; for which purpose moderate doses of mercury and chalk,

[1] Clinical Lectures on the Diseases of Women and Children. Fourth Edition, p. 557. New York, 1856.

or of blue pill with henbane, or of taraxacum and sarsaparilla, or of rhubarb and soda, or of the citrate of magnesia, may be given. I have sometimes seen benefit, especially where the liver has been inactive, from the administration of one-grain doses of calomel, thrice daily. As soon as the gums have become slightly touched, the sickness has ceased; and by just keeping up a slight influence for ten or fourteen days all tendency to relapse has been warded off. The functions of the stomach may also be assisted with great hope of benefit by the administration of pig's pepsine, in from three- to five-grain doses, with the two chief meals of the day. Should purgatives be needed, seidlitz powders, or castor oil, or draughts containing the sulphate and carbonate of magnesia, can be prescribed; or what is often better, a mixture of diluted hydrocyanic acid, diluted nitro-hydrochloric acid, sulphate of magnesia, and camphor water. Where the stomach rejects medicines, active aperient enemata should be used. The following may be recommended as a good formula, the croton oil being omitted unless the bowels are very costive:

Take of,—Castor Oil, 12 fluid drachms; Oil of Turpentine, 2 fluid drachms; Croton Oil, 3 minims; Purified Ox Bile, 5 grains; Tincture of Assafœtida, 2 fluid drachms; Gruel, 8 fluid ounces. Mix for an Enema. To be retained for three or four hours.

When the evacuations have become healthy, we may—in the *second* place—try the effect of some such medicine as the diluted hydrocyanic acid; giving it in doses of three to five minims, either with infusion of calumba and bicarbonate of potash, or in a common effervescing draught with citrate of ammonia, or in some such way as the following:

Take of,—Diluted Phosphoric Acid, 90 minims; Diluted Hydrocyanic Acid, 36 minims; Compound Tincture of Cardamoms, 6 fluid drachms; Volatile Oil of Nutmeg, 12 minims; Water, to 6 fluid ounces. Mix and label,—"One tablespoonful, with the same quantity of water, every six hours."

In many instances more powerful sedatives will be needed. Resort must then be had to small doses of opium or morphia, which often do great good. The extract of the former, in the proportion of half a grain to two grains, with three of extract of hyoscyamus, is a favorite remedy with me; as is also a mixture of aromatic spirit of ammonia, compound tincture of chloroform,

liquid extract of opium, five or ten drops of laurel water, and compound infusion of orange peel. Certain quack preparations are constantly advertised as having a remarkably calming influence on the stomach; but I trust few will be found to lower the practice of medicine to such a mere mechanical art, as to prescribe remedies with the composition and nice properties of which they are utterly ignorant. As well might an experiment be made with Holloway's pills and ointment. Sir James Simpson speaks very strongly in favor of the salts of cerium, which appear to have a "sedative-tonic" action, like those of silver and bismuth.[1] It must be confessed that they have not unfrequently caused me disappointment; but at the same time I allow, that they every now and then act most efficaciously. The oxalate of cerium is generally to be preferred. The dose is from two to three grains, repeated every three or four hours; and it may be given as a pill, or placed dry on the tongue with a small piece of ice to assist in its deglutition. A solution of the nitrate of cerium is sometimes prescribed; but I have had no experience with this preparation. Where the gastric irritability is very great, I often combine three grains of oxalate of cerium with the eighth or twelfth of a grain of morphia, and with advantage. Sir James Simpson has also reported the cure of one severe case—after ice, prussic acid, and half-grain opium pills had failed to give relief—by allowing the lady to inhale some laudanum for a few minutes from a small ether inhaler, hot water being applied to promote its evaporation. Salicine is often a very useful drug, since it allays sickness and promotes appetite and digestion. From three to five grains may be administered thrice daily, with tincture of orange-peel and water. Such agents as quinine or steel will seldom be borne. And although they have been recommended, yet I have never found any benefit in these cases from lemon-juice, orange flower water, green tea, lukewarm gruel, assafœtida, creasote, nux vomica, camphor, conium, acetate of lead, or iodide of potassium; and only rarely from the subnitrate of bismuth. Every now and then a mixture like the following has seemed to allay the vomiting:

Take of,—Carbonate of Magnesia, 40 grains; Subnitrate of Bismuth, 60 grains; Laurel Water, 30 minims; Mucilage of Tragacanth, 6 fluid ounces. Mix and label,—"One small tablespoonful every three or four hours."

[1] Obstetric Memoirs and Contributions. Vol. i, p. 313. Edinburgh, 1855.

With regard to local applications to the epigastric region it must be mentioned that blisters, sinapisms, compound liniment of mustard, liniment of iodine, and turpentine stupes have their advocates. A poultice made with three or four parts of linseed meal, one of mustard, and a sufficiency of boiling water, may be useful, if applied over the stomach for an hour every night or morning. So also, the officinal camphor liniment, to which sufficient chloroform has been added to produce a feeling of heat, can be recommended; but it must be rubbed in every few hours, or lint saturated with it may be kept applied as long as it can be tolerated. Again, a piece of fine flannel saturated with a mixture of laudanum and chloroform, and laid over the abdomen sometimes does good. An elegant and soothing preparation is made by adding about one hundred grains of extract of belladonna to an ounce of glycerine of starch; the mixture being spread on moist lint like a plaster. Equal portions of the officinal aconite, belladonna, opium, and soap liniments form a good sedative application, which may be gently rubbed in for a few minutes twice a day. Other means failing, I have found a bladder of ice kept over the epigastrium as long as it can be comfortably borne, give relief. Such is also the case with the belladonna plaster, though the resin it contains very frequently makes it too irritating to allow of its being worn long enough; with hot linseed meal poultices sprinkled with tincture of belladonna or laudanum; and with fomentations of a strong decoction of chamomile flowers and poppy capsules. When, with disturbed innervation as the principal cause of the vomiting, there has also been some slight morbid action in the gastric mucous membrane, the constant wearing of a wet compress over the whole of the belly has been very useful. And lastly, it may be said that I have not seen any instance where it has seemed advisable to apply cupping-glasses or leeches to the walls of the abdomen; while the practice of venesection is simply mentioned, in order to condemn it.

Not only in cases where the cervix uteri has been tender, but in other instances, I have found the use of medicated pessaries give relief after various means had failed; and hence such as the following may safely be tried:

Take of,—Extract of Belladonna, 25 grains; Extract of Hemlock, 80 grains; Iodide of Lead, 60 grains; Oil of Theobroma, 1 ounce; Olive Oil, 2 fluid drachms. Mix, divide into eight pessaries, and order one to be introduced into the vagina every night.

Where patients are very reduced, or when the nights are restless, from twelve to sixteen grains of extract of opium may be substituted for the hemlock in the foregoing prescription.

Concerning the general treatment it should be recollected, that perfect quiet and the recumbent posture will be indispensable in bad cases. The diet ought to be light and nutritious; and if necessary only very small quantities of liquid food must be given at a time. It is obviously better to administer simply a teaspoonful of milk and one of essence of beef alternately every half hour when such are retained, than to give a teacupful and have the whole returned. A little light wine often does good; and therefore champagne may be allowed, or moselle, or sparkling carlowitz, or dry tokay, or claret, or hock, or a glass of sherry in a little soda-water. In slight cases, where the sickness has only occurred in the morning, I have more than once checked it by directing a small cup of strong coffee, without milk or sugar, to be taken about half an hour before rising from bed; this remedy being also especially useful when an opiate has been given over night. Sucking small lumps of ice will be found refreshing, while it often alone serves to allay the irritability of the stomach; the ordinary cherry-water ice of the confectioners acts in a like manner; and the same remark applies to milk and lime-water, in equal proportions, made cold with ice, and given in small quantities every three or four hours. Where all kinds of ordinary food are rejected, the patient must be supported by nutrient enemata; a favorite formula of mine consisting of three fluid ounces of a strong solution of minced raw meat, half an ounce of cream, an ounce of claret or two drachms of brandy, and thirty drops of liquid extract of yellow cinchona. Such an enema may be repeated every eight hours; from five to ten minims of liquid extract of opium being added to it, if the rectum is irritable. The use of enemata need not necessarily prevent our recommending a modification of *Liebig's Soup for Invalids;* since it will often be tolerated when every other kind of food is rejected. It is thus made:

Take 1 lb. of newly-killed beef or fowl, chop it fine, add eight fluid ounces of soft or distilled water, four or six drops of pure hydrochloric acid, 30 to 60 grains of common salt, and stir well together. After three hours the whole is to be thrown on a conical hair sieve, and the fluid allowed to pass through with slight pressure. On the flesh residue in the sieve pour slowly two

ounces of distilled water, and let it run through while squeezing the meat. There will be thus obtained about ten fluid ounces of cold juice (cold extract of flesh), of a red color, and possessing a pleasant taste of soup; of which from one tablespoonful to a wineglassful may be taken at pleasure. It must not be warmed (at least, not to a greater extent than can be effected by partially filling a bottle with it, and standing this in hot water), since it is rendered muddy by heat or by alcohol, and deposits a thick coagulum of albumen with the coloring matter of blood. If, from any special circumstance (such as a free secretion of gastric juice), it is deemed undesirable to administer an acid, the soup may be well prepared by merely soaking the minced meat in simple distilled water. When the flavor is thought disagreeable it can be concealed by the addition of a little claret.

Moreover, in extreme cases the inunction of the finest sperm oil, or sometimes of salad oil, or even of pure lard, over the whole of the chest and abdomen once or twice daily does good. The powerful smell of cod-liver oil often alone induces nausea, otherwise it would be useful.

Unfortunately, it occasionally happens that all the remedies we can think of fail to exert any beneficial influence. The patient is seen to grow weaker and more emaciated hour by hour. Not only has the prolonged want of nourishment to be contended against; but the mere act of vomiting, after a time, produces a miserable sense of utter prostration. It then only remains—in the *third* place—to induce abortion; care being taken not to delay this proceeding too long, since it will in all probability merely hasten death if signs of extreme exhaustion are present. The minute details of the best method to be adopted for procuring the expulsion of the fœtus need not be given here. It is sufficient to say that the membranes are to be punctured so as to allow the liquor amnii to drain off quickly. For as soon as this is done, the sickness will in almost all cases cease; while as the pains of labor seldom set in within less than eighteen or twenty-four hours, so there will be an opportunity for administering nourishment several times before the patient's modicum of strength is taxed by the occurrence of parturition, and maybe of hemorrhage. It only remains again to express my opinion, that this plan of treatment ought not to be resorted to without a consultation between two or more practitioners. Moreover, the necessity for destroying the product of conception, in order to save the mother's life, should be fairly and fully explained to the husband or relatives before resorting to the necessary steps.

6. Cardialgia.—Many women, especially such as are of a nervous temperament, suffer much from heartburn during pregnancy, and often to a very distressing degree. Cardialgia may exist alone, or it may be combined with pyrosis—water-brash. To remedy these symptoms, any derangement of the abdominal viscera which may be present must be removed; particular attention being paid to the general mode of living, the amount of daily exercise, and the functions of the skin. Then one of the simple bitter infusions, or bismuth and bicarbonate of soda, or oxide of silver, or small doses of the mineral acids—especially the diluted nitro-hydrochloric—are to be prescribed. Some such form as this will possibly effect a cure:

Take of,—Diluted Nitro-hydrochloric Acid, 1 fluid drachm; Diluted Hydrocyanic Acid, 18 minims; Infusion of Chiretta, or Compound Infusion of Gentian, to 8 fluid ounces. Mix and label,—"One-sixth part three times a day."

Benefit is sometimes derived from restricting the patient's drink to lime-water and milk, or to soda-water and milk, or to iced water; alcoholic stimulants of most kinds being unnecessary, while all malt liquors and port wine and raw spirits are very injurious. For food, white fish, mutton, chicken, and stale bread should suffice; with some digestible ripe fruit in the morning, in the place of vegetables. Digestion can also often be aided with advantage by the administration of pepsine with the two chief meals of the day.

7. Hæmatemesis.—A discharge of blood from the stomach, during pregnancy, may occasionally take place without the existence of any appreciable disease of this viscus. Dr. Churchill says that the causes are probably to be found in a local or general plethora; and that he has no doubt it is, in many instances, a species of vicarious menstruation.[1] I have never, however, met with any cases which could lead me to acquiesce in the latter opinion. The entire theory of vicarious menstruation rests on far too fragile a support, to allow of its being unnecessarily strained to explain a simple phenomenon like this. The fact would seem to be, that the gastric mucous coat is apt to get congested quite independent of pregnancy. When it does so, one

[1] On the Diseases of Women. Fifth Edition, p. 635. Dublin, 1864.

or more capillary vessels may rupture; just as happens, under like circumstances, in the pituitary membrane lining the nasal fossæ. In this form of hæmatemesis the attack is very seldom dangerous, although it alarms the patient. Cold acidulous drinks, ice and iced water, low diet, a large sinapism over the epigastric region, an active purgative enema, a few doses of gallic acid, and rest in bed for a day or two, will usually suffice to stop it.

8. Diarrhœa.—Attacks of diarrhœa not uncommonly occur alternately with constipation, or more rarely with morning sickness. Some patients suffer habitually from looseness of the bowels during pregnancy; others are merely affected occasionally, owing to indulgence in improper food; whilst a third class appears liable to periodical attacks, setting in perhaps about once a month. When the diarrhœa is allowed to continue unchecked, it not only generally weakens the patient, but perchance may produce abortion by destroying the life of the fœtus; or when the disorder is attended with tenesmus, it may directly tend to bring on contractions of the uterus. Much more rarely, however, the relaxation appears to do very little or no mischief, but on the contrary seems to have a beneficial influence; since, if attempts are made to check it, the system immediately resents the uncalled-for interference. The following example, recorded by old Peter Rommelius, proves the correctness of this observation:

A lady of spare habit and bilious temperament, as well as of a remarkably placid disposition, was always seized with a diarrhœa immediately after conception. With unfailing regularity the looseness returned every month during the whole term of pregnancy, being often accompanied by violent gastralgia. The advent of this periodical diarrhœa was always regarded by the patient herself as an indubitable sign of pregnancy. The symptom continued at each period for seven or eight days; while on each day there were from fourteen to twenty-five copious alvine discharges. Although but little food could be taken, a moderately good state of health was enjoyed. In her first pregnancy medicines were exhibited with the intention of stopping the diarrhœa; but such unfavorable symptoms were produced, that it was necessary to discontinue them. In the absence of pregnancy the catamenia were natural and regular; whilst during the first week after conception there was an abundant leucorrhœal discharge, which became suspended as the diarrhœa got established. When the case was reported, the lady was the mother of three healthy children.[1]

[1] Miscellanea Curiosa, sive Ephemeridum Medico-Physicarum Germanicarum Academiæ Naturæ Curiosorum. Decuria secunda. Annus Quintus. P. 303. Norimbergæ, 1687.

The treatment of the diarrhœa of pregnancy must be cautiously conducted. Of course, when the looseness appears to be in any way beneficial, the practitioner will withstand all importunities for interference. Supposing, too, that the attack is slight, no remedies beyond attention to the diet will be required; for a cure may generally be effected by keeping the patient for twenty-four hours to moderate quantities of milk and arrowroot and rice. If the symptoms show—as they not unfrequently do—that some irritating matter is in the intestines, from two to four fluid drachms of tincture of rhubarb, or half an ounce of castor oil, should be ordered. Where the evacuations are offensive and acrid, indicating derangement of the secretions, four or five grains of mercury and chalk, repeated for three successive nights, will be beneficial; while if the discharges are simply excessive, from five to ten grains of Dover's powder can be combined with the mercury and chalk, or we may administer some common astringent mixture containing either logwood, kino, rhatany, tannin, or catechu, &c. It should also be recollected that no agent so speedily arrests the tenesmus and relieves the local pain as the officinal opiate enema, or a suppository consisting of a grain of extract of opium with twenty grains of the oil of theobroma.

9. Constipation.—This affection is only troublesome when it has been allowed to continue for several days. It is indeed incredible the length of time that some careless or indolent women will go without an evacuation from the bowels; and I have more than once seen most serious symptoms produced, by the lower part of the colon and rectum having become completely blocked up with hardened fæces, owing to such neglect.

The symptoms produced by constipation are at first slight, simple headache and general uneasiness being the most prominent. Where a considerable accumulation of fæces has taken place, these symptoms are much increased. Under such circumstances there is more or less fever, loss of appetite, sleeplessness, distressing dreams, bearing-down pains, piles and nausea. If we only question the patient carelessly, the cause of the suffering may readily be overlooked; since it has happened—as I have before explained—that a small quantity of liquid matter escaping by a channel formed through the mass or between the column of hardened fæces and the side of the intestine, and discharged

daily, has led to the belief that the bowels were properly open. In such instances a vaginal examination should be instituted, when the rectum will be found distended and pressing into the vagina, so as materially to diminish the calibre of this canal. Among other inconveniences, this condition at the time of labor has formed a positive obstruction to the passage of the child.

If with obstinate constipation there coexist severe vomiting, then the umbilical and inguinal and crural regions must be carefully examined lest there be any protrusion of intestine. The occurrence of hernia during pregnancy is not very rare. The natural openings in the abdominal parietes are rendered more and more lax as the walls become distended; and it can easily be understood how the enlarging uterus, by pressing upon the intestines, facilitates the escape of a portion of the bowel or omentum through either of the weak points. If a hernia be found it should of course be reduced, and a proper truss put on to prevent its descending again; while if it be irreducible from long standing, it is as well to give it support by a firm bandage carefully applied. When the rupture is strangulated, an operation must be performed in the usual manner to divide the constriction, so as to permit the contents of the sac to be restored to their normal position.

For the treatment of simple constipation medicines are seldom necessary. It is generally advisable at all events to first try the effect of daily exercise, and regularity in soliciting intestinal action; together with the eating of brown bread, fresh vegetables, ripe fruits, baked apples, figs, prunes soaked in olive oil, mulberry juice, marmalade, honey, or tamarinds. Where brown bread is disliked or proves indigestible, the aerated bread will be found more useful than the common household or fermented bread, since it contains a peculiar agent which is absent in the latter. This substance, named cerealin, is found in the external coat of the wheat grain, and is torn away with the bran in the ordinary process of grinding; the miller being careful to prevent any mixture of the outer coat with the flour obtained from the centre of the grain, since he knows that its presence will diminish the white color of the bread after fermentation. The action of cerealin as a special digestive solvent of the constituents of the flour—gluten and starch—is particularly insisted upon by Dr. Dauglish, who has introduced this new kind of bread; this

gentleman asserting that its effect upon the gluten of wheat is precisely similar to that of pepsine on the fibrine of meat. Pepsine acting alone on fibrine dissolves it, but does so very slowly; while if lactic acid be added, solution takes place very rapidly. In like manner the starch present with the gluten of wheat is said to be acted upon by the cerealin, and to produce the necessary lactic acid to assist in the solution of the gluten by cerealin. Moreover, another advantage of the new bread is the absence of the prejudicial matters—acetic acid and the yeast plant—imparted to ordinary bread by the process of fermentation.

To aid the digestion of animal food, pepsine—the digestive principle of the gastric juice—can be administered; by means of which dyspepsia, attended with constipation, will often be relieved. Sometimes the practitioner may direct the patient to drink half a pint of cold water the last thing at night and again early in the morning, with a good result; or a glass of Seltzer water had better be taken at night, with a tumblerful of equal parts of milk and soda-water early in the morning. Then, in more obstinate cases, the daily use of soap and water enemata is to be recommended; or the confection of senna with extract of taraxacum and acid tartrate of potash in equal proportions—in doses of a teaspoonful—twice or three times a week, may be advantageously prescribed. The officinal solution of carbonate of magnesia, in doses of two or three tablespoonfuls before breakfast, is a valuable remedy. If there be much tympanites, a capital carminative cathartic can thus be made:

Take of,—Manna, 1 ounce; Oil of Anise, 1 fluid drachm; Distilled Water, 8 fluid ounces; Carbonate of Magnesia, 220 grains; Mix and label,—"One wineglassful every four or six hours, until relief is obtained."

In the same way one tablespoonful of castor oil, with two drops of oil of peppermint and five or ten minims of tincture of opium, will give relief; or rhubarb and quinine in the following manner may be useful if there be dyspepsia with the flatulence:

Take of,—Tincture of Quinia, Tincture of Rhubarb, of each 1 fluid ounce. Mix. One teaspoonful to be taken in a glass of sherry every day directly after luncheon.

When, however, any accumulation of fæces has been allowed

to take place, active purgatives are absolutely required, and such as this may be ordered:

Take of,—Purified Ox Bile, 12 grains; Carbonate of Magnesia, 30 grains; Sulphate of Magnesia, 220 grains; Tincture of Jalap, 2 fluid drachms; Compound Tincture of Cardamoms, 4 fluid drachms; Camphor Water, to 4 fluid ounces. Mix and label,—"Half of this mixture to be taken immediately, and the remainder in three hours if necessary."

This mixture proving inefficient, enemata must be resorted to. Great advantage often results from injecting from four to eight ounces of warm olive oil into the bowel, and allowing it to be retained for about six hours. By the end of this time it will have softened the hard motion filling the rectum, so that the substance can then be easily brought away by a common aperient enema. Sometimes, however, the mass is so very hard and the gut is so completely obstructed by it, that it has to be mechanically removed with a scoop or with the handle of a spoon. In all such cases, as a rule, it is a good plan subsequently to order five or ten grains of the inspissated ox-gall to be taken daily for a considerable time, to prevent any recurrence of the constipation. Moreover, if there is evidently a want of tone in the colon, a mixture should be given thrice daily of fifteen or twenty minims of the dilute nitric acid in the compound infusion of gentian, or in the decoction of yellow cinchona.

10. Icterus Gravidarum.—We sometimes see pregnant women, at an advanced period of gestation, suffering from jaundice, for which we can assign no other cause than the weight of the gravid uterus or of the loaded intestine in constipation pressing on the bile ducts, and so impeding the flow of this secretion. It generally passes away without giving rise to any troublesome symptoms, except when too actively treated. The effects of this form of jaundice being trifling, only mild remedies are required. Attention to the stomach and bowels will perhaps be called for, while a few doses of alterative or aperient medicine will commonly do no harm. Possibly, relief will be afforded by the patient lying on her left side. Very often, however, the symptoms continue until after delivery.

In addition to the foregoing, a pregnant woman may accidentally become the subject of jaundice from some direct impedi-

ment—as the obstruction of gall-stones—to the flow of bile into the duodenum. Under these circumstances, if powerful remedies be ordered abortion will very possibly be induced. Dr. David Davis mentions two examples which corroborate this remark:

One was married, and gave intimation of her being pregnant; the other was not married, and concealed her situation. The first was received into the hospital as a subject of tertian ague, for which one of the physicians prescribed bark. But the bark disagreed, and produced vomiting and abortion. In two days afterwards the whole of the jaundice had disappeared. She had advanced in her pregnancy about five months. The other being an unmarried woman, omitted to mention the fact of her pregnancy. She was treated actively for jaundice by another physician, who gave her emetics. Part of her ovum came away, and was followed by a sanguineous discharge. She then confessed that she was pregnant. The emetics were laid aside and innocent placebos were substituted. All her jaundice left her, and in a few days subsequently she was delivered of the remainder of her ovum.[1]

The mere fact that there is some old-standing hepatic affection is no bar to gestation running a natural course, or to its terminating at the proper time in a natural labor. Even when there is great hypertrophy of the liver, this condition may not interfere with the gradual enlargement of the uterus; although considerable distress will be produced by the abdominal distension as the time of parturition draws nigh. This appears to have been the case in an example of pregnancy complicated with great enlargement of the liver, which has been reported by M. Villeneuve. The chief points in the history are these:

A lady, thirty-five years of age, was first attacked with inflammatory engorgement of the liver and jaundice when twelve years old. The inflammation and icterus disappeared under the use of remedies, but the gland remained of a large size. At the age of thirty, the general health was bad, while the enlargement of the abdomen was such that she presented the appearance of a woman at the full period of gestation. An opportunity was shortly afterwards presented to her of contracting an advantageous marriage; and M. Villeneuve with some other physicians was consulted as to the possibility in the first instance, and then as to the probability, of her being delivered safely of a living child, provided she accepted the offer. Unfavorable replies were given to these interrogatories; but nevertheless the lady married, and became pregnant. During the latter weeks of gestation she suffered much from the great tension of the abdominal walls, as well as from dyspnœa; but when labor set in she had an easy time, the child was healthy and well developed, and a quick recovery ensued.[2]

[1] The Principles and Practice of Obstetric Medicine. Vol. ii, p. 872. London, 1836.

[2] Journal de Médecine, Chirurgie, Pharmacie, &c. Par Corvisart, Leroux, et Boyer. Tome xxix, p. 354. Paris, 1814.

A much more serious class of cases remains for consideration. Acute atrophy of the liver—described by different authors under the names of softening of the liver, diffused hepatitis, or fatal jaundice—is one of the most remarkable diseases to which any gland in the body is liable. Women are at all times more subject to acute atrophy of the liver than men; but pregnant females appear especially predisposed to it. Moreover, this rare affection has happened more frequently between the third and seventh months of gestation than at any other periods.

The manner in which the disease sets in is not uniformly the same. In about half the recorded cases there have been premonitory warnings, lasting from a few days to two or three weeks. During this time complaint is chiefly made of slight gastric disturbance, sick headache, rheumatic pains, loss of appetite, irregularity of the bowels, and mental with bodily depression.

The symptoms which directly arise from acute atrophy of the liver are jaundice, sometimes with the formation of petechiæ and large ecchymoses; and vomiting, at first of the contents of the stomach with mucus, and then of a matter like coffee-grounds. The effects upon the nervous system are manifested at the onset by irritability and great despondency; but soon there is wandering which merges into noisy delirium and convulsions, followed by stupor and deep coma. At the commencement, the pulse is slow; as the cerebral disturbance is manifested, however, it rises in frequency to about 120, becoming slow again as stupor sets in, and getting frequent and small as the fatal termination approaches. The tongue and teeth are coated with black sordes. The abdomen is more or less tender, pains being complained of about the epigastric and right hypochondriac regions. The extent of hepatic dulness rapidly diminishes, while that of the spleen increases,—conditions which will scarcely be appreciable if gestation be far advanced. There is always obstinate constipation; hard clay-colored stools coming away under the influence of purgatives, with subsequently evacuations which are black from the presence of blood. The urine is natural in quantity, though from an inability to pass it the catheter may be required. On analysis, this secretion is found loaded with bile-pigment, and perhaps is albuminous. A microscopic examination of concentrated urine will generally detect the presence of tyrosine and leucine; the former appearing as long needle-shaped crystals and

small star-like bodies, the latter as finely-marked laminæ and globular masses with fissured surfaces and concentrically-thickened walls. More frequently than not, the uterus expels its contents; profuse uterine hemorrhage sometimes following the delivery of the fœtus. Then, lastly, the jaundice increases; bed-sores form over the sacrum, if life be prolonged beyond a week or ten days; and there are hemorrhages from the nose, gums, stomach, uterus, bowels, bronchi, &c.

This disease usually ends fatally within a week from the appearance of the acute symptoms; while sometimes death occurs at the end of eighteen or twenty-four hours. It has been doubted whether recovery ever takes place; but, however this may be, I know of no reported case in which there has been a favorable termination during pregnancy. The favorite remedies have been the mineral acids, drastic purgatives, quinine, and the free use of ice; but patients treated with all the skill the physician could exercise, have fared neither better nor worse than those who have been left alone.

By way of illustrating the preceding remarks, the following case—abbreviated from the report of Professor Frerichs—is deserving of attention:

P. Nitschke, aged 24, a carpenter's wife, was admitted in a semi-conscious state into the All-Saints' Hospital, on 21st January, 1858. She was robust and well-nourished, and of a florid complexion. Her friends said she had previously enjoyed uninterrupted good health. She was in the seventh month of pregnancy. It appeared that on the 17th January she complained of loss of appetite, constipation, headache, general malaise, and low spirits. On the 20th she applied to Dr. Hasse, who observed a slight yellow tinge of the face. He directed her to be admitted into one of the wards: this was done on the following day. After seeing Dr. Hasse she had repeated vomiting, and became delirious. On admission she was much excited: pulse 80, respirations 20, temperature natural. Conjunctivæ of a pale yellow tinge, as was the skin of face and neck. Both hypochondria and the epigastrium were tender on pressure.

On percussing the hepatic region, the dulness in the axillary line amounted only to $1\frac{1}{2}$ inch. No dulness corresponding to the spleen could be made out. The thoracic organs were natural. Hydrochloric acid was ordered. During the night of the 21st January, there was great restlessness, and she kept uttering loud unmeaning cries. Pulse had risen to 112: respirations stertorous, 26. At 11 A.M., on the 22d, she was delivered of a dead seven months' fœtus, which presented no trace of jaundice. There was profuse uterine hemorrhage. The excitement abated, and she lay in a quiet unconscious condition. The jaundice was rather more intense than on the previous day. The bowels had been confined for three days. The urine when drawn off was found free from albumen. The hydrochloric acid was continued; colocynth

and jalap were also administered. During the night of the 22d the patient lay in a state of deep coma. Uterine hemorrhage continued. Ether and musk were added to the mineral acid mixture. On the morning of the 23d the jaundice appeared increased. Pulse 108; respirations stertorous, 24; no elevation of temperature. Vomiting occurred at intervals: bowels continued confined. The urine contained bile-pigment, but not the biliary acids: acicular crystals of tyrosine were detected, with laminæ of leucine. In the afternoon, the pulse rose rapidly to 134; the skin became covered with clammy sweat; and death took place about 7 o'clock.

At the autopsy, 18 hours after death, the skin about the head and chest was seen to be more jaundiced than that of the lower extremities. There was nothing noteworthy about the brain, lungs, or heart. The stomach was free from ulceration: it contained a matter like coffee-grounds. The large intestine contained scybala faintly tinged with bile. The liver lay collapsed against the posterior wall of the abdominal cavity: it was dry and soft, while its capsule was puckered and opaque. The dimensions of the gland were diminished in every direction, particularly in thickness. The gall-bladder contained a small quantity of gray mucus. The tissue of the liver felt flabby and dry: the ramifications of the portal vein surrounding the lobules were distended, whilst the centre of the lobules presented a citron-yellow color; here and there were ecchymoses. The secreting cells were disintegrated, numerous drops of oil and brownish-yellow molecules being found in their place; only a few isolated cells loaded with oil being detected in the rounded border of the right lobe. The weight of the liver was 1.807 lbs. avoir., and that of the entire body 123.898 lbs., making the ratio of the former to the latter as 1 to 68.5. In healthy females of the same age and weight, the weight of the liver is about 4.409 lbs., and the ratio is as 1 to 28. Thus the organ had lost in six days 2.601 lbs. in weight. It was also considerably diminished in size. The blood in the heart and in the venæ cavæ contained a small amount of leucine, while larger quantities were found in the cerebral substance, the liver and the spleen. The presence of a considerable amount of tyrosine in the liver was made out, while in the spleen none could be detected with positive certainty.[1]

Section 2.—Disorders of the Organs of Respiration and Circulation.

1. Dyspnœa.—Pregnant women sometimes suffer from difficulty of breathing during the latter weeks of gestation; and occasionally from hysterical dyspnœa in the early months. With regard to the first variety, as it depends on the enlarged uterus pushing up the diaphragm and thus diminishing the capacity of the thorax, but little can be done for its relief beyond propping the patient up in bed, regulating the diet in order to prevent

[1] A Clinical Treatise on Diseases of the Liver. By Dr. F. T. Frerichs, Professor of Clinical Medicine in the University of Berlin. Vol. i, p. 202. Translated by Dr. Murchison for the New Sydenham Society. London, 1860.

flatulent distension of the intestines, keeping the bowels properly open, and directing that no tight clothing be worn. The second form of dyspnœa will be best cured by antispasmodics and diffusible stimulants, such as spirit of ether, compound tincture of chloroform, tincture of Indian hemp, camphor, sumbul, assafœtida, valerian, &c.

2. Cough.—During the early months of gestation, a nervous or spasmodic cough frequently affects delicate or susceptible females. The attacks come on in violent paroxysms, especially at night; occasioning much distress, preventing sleep, and rendering the sufferer anxious and fretful. There is no mucous or purulent expectoration. This cough generally depends on the sympathetic influence exerted by the uterus on the pulmonary organs; or it may result, at a later period, from the impediment which the progressive growth of the uterus by its pressure on the diaphragm and aorta offers to respiration and circulation. It is at once distinguished from the cough due to organic disease by the absence of expectoration, fever, quickened pulse, and of all stethoscopic signs. When allowed to go on unchecked, the repeated shocks will possibly loosen the connection of the placenta with the uterus, and so produce abortion. And even supposing this not to happen, yet the loss of rest, the uneasiness and sense of weariness, with the headache produced by the fits of coughing, give rise to such general disturbance of the system, that very serious mischief may in the end result. M. Miquel asserts that the epidemic cough of 1675 so powerfully affected pregnant females, that most of those who were attacked by it died.[1] In the treatment of these cases I have found no remedies so useful as antispasmodics combined with morphia or opium. Such a mixture as the following often gives great relief:

Take of,—Spirit of Ether, 3 fluid drachms; Compound Tincture of Chloroform, 1 fluid drachm; Diluted Hydrocyanic Acid, 15 minims; Solution of Hydrochlorate of Morphia, 1 fluid drachm; Compound Tincture of Cardamoms, 6 fluid drachms; Water, to 8 fluid ounces. Mix and label,—"One-sixth part every six or eight hours."

The officinal morphia, or morphia and ipecacuanha, lozenges, can also be recommended. Or an agreeable tincture may be

[1] Traité des Convulsions chez les Femmes Enceintes, en Travail, et en Couche, p. 67. Paris, 1824.

made with a few drops of the solution of hydrochlorate of morphia, and equal parts of syrup of squill and syrup of tolu. Where the paroxysms are infrequent, they can sometimes be checked by a draught made thus:

Take of,—Ammoniated Tincture of Valerian, 30 minims; Tincture of Sumbul, 20 minims; Tincture of Belladonna, 10 minims; Compound Tincture of Camphor, 30 minims; Camphor Water, to 12 fluid drachms. Mix for a draught. To be taken immediately a fit of coughing is threatened.

In the use of these narcotic remedies care must be taken not to allow them to produce prolonged constipation. The doses of the sedatives must also be so regulated as not to induce nausea subsequently. Where the stomach is at all irritable, a cup of strong coffee early in the morning will frequently prevent sickness.

According to some authorities antiphlogistic measures, such as venesection, blisters, croton oil liniments, and tartar emetic, are sometimes required; but I have always been very loth to try them in the cases which have come under my notice.

3. Hæmoptysis.—Spitting of blood from the rupture of some small artery distributed to the lungs is very rare during pregnancy, unless the hemorrhage be due to the presence of formidable organic disease.

In all cases, a very careful examination of the lungs and heart and large vessels should be made. Mistakes in diagnosis are not very uncommon, a slight deposit of tubercle being often overlooked. I have heard of a lady being assured that the blood which she expectorated was merely a secretion from the mucous membrane of the bronchial tubes; when in fact she had a small cavity at the apex of one of her lungs. Should the practice of auscultation prove the existence of any organic disease, such special remedies as the nature of the affection may demand must be had recourse to. Where no cause for the bleeding can be detected, the recurrence of the latter will in all probability be prevented by a few doses of gallic acid, or of the ammonia iron alum.

4. Palpitation of the Heart.—The increased activity of the circulation during pregnancy, together with the altered composition of the blood, renders most women liable at one period or

another of gestation to attacks of palpitation of the heart. These attacks are of variable severity. They are quite independent of any organic disease of the heart; nervous and feeble females suffering more than the strong and healthy. When the palpitation occurs in the earlier months, it is said to be due to sympathy with the uterine organs; when in the latter, either to the pressure of the womb on the abdominal vessels causing a reflux of the blood to the superior parts of the body, or to displacement of the heart and pericardium owing to the pushing upwards of the stomach, diaphragm, &c. Where the palpitations are violent, all the large arteries of the body seem likewise to pulsate excessively: the respirations also become hurried, there is noise in the ears, indigestion, headache, and giddiness.

The physician who has once well observed a case of cardiac hypertrophy, can hardly mistake nervous palpitations for this affection. In the cases we are considering there is none of the lividity of the cheeks and lips so commonly seen in hypertrophy; and the patient, instead of being listless or sluggish, is generally full of life and spirits. Where the pressure of the gravid uterus is the cause of the palpitations, taking food increases them. Moreover, exercise diminishes them very often; while in hypertrophy it increases them. So also the increased impulse of the hypertrophied heart contrasts strongly with the sharp, short beat of nervous pulsation.

The treatment of these cases requires some little caution. Generally speaking, antispasmodics with opiates and rest will sooner give relief during a paroxysm of palpitation than any other remedies; while a permanent cure may afterwards be effected by the careful use of ferruginous tonics, by allowing a nutritious but unstimulating diet, and by daily gentle exercise in the open air. In those cases where there is plethora and a tendency to internal congestions, a spare diet with mild purgatives will be needed; depletion in any more active form being usually very injurious. There are possibly a few exceptional cases where the application of leeches is required; but I do not think such will be met with amongst the inhabitants of large towns.

5. Fainting.—Some women constantly faint at the period of quickening; but they are usually in delicate health, and perhaps have been weakened by the continuance of morning sickness.

Hysterical females, and such as are in the habit of fainting from slight mental or corporeal excitement, are also particularly likely to suffer during pregnancy.

The sensations which precede an attack of syncope are usually distressing; though Chamberet and the celebrated Montaigne have stated from their own experience that they are highly pleasurable. During the swoon the surface of the body is cold and pale; the pulse at the wrist becomes weak, so as often scarcely to be detected; the power of voluntary motion is abolished; consciousness is impaired, if not lost; and the respiratory actions are nearly suppressed. On practising auscultation, the heart will be heard beating much more feebly than is natural. In some instances there is relaxation of the sphincters, and a discharge of the excretions. Repeated fits of syncope have produced abortion. The duration of the seizure varies from a few seconds to ten or fifteen minutes, or even longer. As the patient gradually recovers, nausea and vomiting, or palpitations of the heart, or attacks of hysteria, often set in. Prolonged syncope has occasionally ended in dissolution. John Burns says: "There is a species of syncope that I have oftener than once found to prove fatal in the early stage of pregnancy, which is dependent, I apprehend, on organic affections of the heart, that viscus being enlarged, or otherwise diseased, though perhaps so slightly as not previously to give rise to any troublesome, far less any pathognomonic symptoms. Although I have met with this fatal termination most frequently in the early stage, I have also seen it take place so late as the sixth month of pregnancy."[1]

That fits of syncope should not very uncommonly occur at advanced stages of gestation might be expected; for we know that then especially the corpuscles of the blood are diminished in amount, the albumen is decreased, the proportion of iron is below the average, while the water is increased. These are precisely the characteristic features of chlorosis and anæmia. Moreover, why in pregnancy the proportion of fibrine in the blood should be almost always above the physiological average can only be explained on the hypothesis, very generally entertained by chemists at the present time, that this constituent is

[1] The Principles of Midwifery. Fourth Edition, p. 174. London, 1817.

formed at the expense of the albumen, the marked diminution of the latter being consequently the cause of the increase of the former. Now, the correctness of the arguments which may be drawn from the results of chemical analysis is borne out by the symptoms which are so often complained of by pregnant women; for they are identical with those experienced in chlorosis. In both there is the same bodily and mental depression, and a corresponding liability to palpitations; the cerebral symptoms are similar; there are the like sudden flushings of the face, and attacks of chilliness alternating with increased heat; and there is the same dyspepsia, loss of appetite, and tendency to neuralgia. Andral has long ago shown that either too great or too small an amount of corpuscles deranges certain functions of the brain in the same manner; and hence so many of the symptoms of anæmia have often been mistaken for indications of plethora.

During an attack of syncope no treatment can be better than that usually practised; such as the admission of fresh cool air, sprinkling the head and face with cold water, the recumbent posture, the removal of all tight articles of clothing, the cautious application of ammonia to the nose, and perhaps the use of sinapisms to the epigastrium. Subsequently, tonics and a chiefly animal diet may prevent the recurrence of an attack. Even when there is disease of the heart, great good can often be done by the careful exhibition of mild preparations of steel.

6. Enlargement of the Thyroid Gland.—A few cases have fallen under my notice in which delicate women, liable to attacks of palpitation of the heart, have suffered from an enlargement of the thyroid gland during pregnancy. In these instances the patients have been living in their customary manner and in localities where they have long resided; so that none of the usual conditions which lead to the production of goitre have been discoverable. The only change has been that they have become pregnant. Sometimes, the gland has been slightly enlarged prior to pregnancy; and then the occurrence of the latter has appeared to serve as a stimulus, making the hypertrophy progress at a rapid rate.

The thyroid body is one of those ductless glands with the use of which we can hardly be said to be acquainted. It has been demonstrated by Mr. John Simon, that this body, or an organ

representing its place and office, may be found in all the vertebrata. And it is this gentleman's opinion, that "although the gland shifts its position most variously, yet it always maintains an intimate *relation to the vascular supply of the brain;* being so nourished that it can alternate a greater or less nutrition, according to the activity or repose of that nervous centre."[1] The weight of the gland, in the human subject, varies from one to two ounces. It is generally larger in females than males, and it often appears to swell slightly during menstruation. In the cases of goitre, in women, which have fallen under my notice, the right lobe has been more frequently enlarged than the left.

During the year 1860, Professor Natalis Guillot read a paper before the Société Médicale des Hôpitaux, in which he stated that every year he was in the habit of seeing women with enlargement of the thyroid body coming on during pregnancy. The affection, he says, is not usually dangerous, but he relates two instances in which death occurred. The principal points in these interesting cases are as follows:

In the *first* instance, a lady, 30 years of age, of good constitution, found her neck slowly increasing during her first pregnancy. In her second pregnancy, in 1855, the tumor increased again and became troublesome. After suckling had ceased and the menses had returned regularly, the swelling continued to get larger; giving rise to much pain, facial neuralgia, palpitations, vertigo, and suffocative asthmatic paroxysms. In 1858, there was considerable weakness: on compressing the enlarged thyroid respiration became embarrassed. A few days after this examination, the patient was nearly asphyxiated during an attack of dyspnœa; laryngotomy was performed with immediate relief. Death occurred, however, two days afterwards.

The *second* example was that of a woman, about 29 years of age, who, after her first pregnancy, four years previously, complained of an enlargement of the neck. She paid but little attention to it, however, until after her second labor, nineteen months back. When this young woman entered the hospital Necker, no other disease beyond the enlargement of the thyroid could be detected. This gland had then become very voluminous, extending from the thyroid cartilage to the sternum. The respiration and voice were embarrassed; she was liable to suffocative paroxysms. She stated that these phenomena had come on gradually from the time of her first pregnancy, increasing especially during the second. After remaining in hospital for a week, the paroxysms of dyspnœa became more and more severe, until at last one seizure ended fatally. An examination subsequently revealed no other lesion than the enlargement of the thyroid, this body being nearly the size of the human brain. The mass was divided into three lobes, but the central lobe was overlapped and hidden by the larger lateral portions. Posteriorly, the trachea

[1] Philosophical Transactions of the Royal Society. Vol. cxxxiv, p. 302. London, 1844.

was seen considerably flattened. At the sides of the neck, the two carotid arteries and the pneumogastric nerves were evidently compressed against the transverse processes of the vertebræ by the weight of the lateral lobes. The tissue of the gland was healthy in appearance; but its fibrous framework was greatly hypertrophied, forming large and thick and numerous partitions, while the vesicles or cellules were considerably increased in size. Hence the lesion consisted of an hypertrophy of the fibrous and granular elements forming the thyroid; which hypertrophy Professor Guillot regards as only one of the manifestations of the excessive production of fibrine during pregnancy. To this is in great part due the progressive development of the uterus and mammary glands [1]

Professor C. Hecker, while discussing the reactions between disease and the reproductive processes, relates the history of a patient who had a considerable swelling of the thyroid, impeding respiration. In her fifth pregnancy the enlargement rapidly increased; while œdema of the legs and abdomen, with albuminuria, set in. When the time for delivery had nearly arrived, she suddenly complained of dizziness of sight; this being followed by dyspnœa and death. Seven minutes afterwards the Cæsarean section was performed, and a stillborn child removed; which could not be resuscitated, though its heart beat slightly.[2]

The cases of goitre, occurring during pregnancy, which have occurred in my own practice have seldom been attended with alarming symptoms. In the following instance, however, a fatal result ensued:

On the 20th November, 1863, I delivered a lady, 27 years of age, of her second child. The labor was easy and natural: the gestation had only advanced to the seventh and a half month. The infant died at the end of fourteen hours. In a few days my attention was directed to a swelling in the neck, of which these particulars were given: The patient was always strong until her marriage, and there was nothing wrong with her neck, nor had there ever been any strumous enlargements of the cervical glands. While pregnant with her first child, she found that the neck became enlarged, but little notice was taken of it as there was no pain or inconvenience. The child when born seemed feeble, but she suckled him for six weeks, when he died. During the suckling the swelling increased. Three weeks subsequently to the enforced weaning she again became pregnant. She had advice for the enlargement, and was told it was an ordinary goitre which could not be cured. During this second pregnancy the thyroid gland increased still more, and at times she experienced slight attacks of difficult breathing, but this was generally on making more than ordinary exertion. When I examined the gland, each lobe was found much hypertrophied, being four inches in length and three in breadth. After the mammary glands had

[1] Archives Générales de Médecine, p. 513. Paris, Novembre, 1860.

[2] A Biennial Retrospect of Medicine, Surgery, &c., for 1865–66, p. 391. New Sydenham Society: London, 1867.

become quiescent at the end of November, 1863, she was ordered steel and cod-liver oil, with a very nourishing diet. Under the influence of this treatment the general health appeared somewhat to improve; but the enlargement of the thyroid did not diminish.

In the February of 1864 she went to Ramsgate, and for a time I lost sight of her. On the 5th September, a few weeks after her return to the neighborhood of London, I was again requested to see her. She was then between two and three months gone with child. Her condition was distressing; while she more particularly complained of great exhaustion, frequent attacks of spasmodic dyspnœa, complete loss of appetite, nausea, palpitation, and diarrhœa alternating with constipation. The urine was scanty, high-colored, and albuminous. There was marked exophthalmia, both eyes being equally prominent. The thyroid body measured six inches in length, and nearly as much in breadth. The lower extremities were œdematous; and there was considerable enlargement of the spleen, with some ascitic fluid in the peritoneum. Two or three drops of blood, taken from a prick in the finger, showed a large excess of colorless corpuscles when submitted to a microscopic examination. It was clear that nothing could be expected from treatment, beyond an amelioration of suffering. Her weakness steadily increased, and death occurred from exhaustion in the early part of December. Permission to make a post-mortem examination could not be obtained.

7. Morbid Conditions of the Spleen.—Seeing that the colorless corpuscles of the blood are increased during pregnancy, and remembering that in the disease known as leucocythemia the spleen is often considerably enlarged, it is rather surprising that splenic hypertrophy is not much more frequently met with during gestation than it really is. Every now and then, however, a case comes under observation where this gland undergoes enlargement to a great degree; the increase in size being accompanied by a certain amount of softening. Sometimes, the enlargement disappears after delivery; possibly to return again and again in subsequent pregnancies. But in a few unfortunate cases the capsule of the gland has ruptured, either in consequence of a fall or blow, or under the influence of some unusual or sudden muscular effort; the laceration being followed by a fatal effusion of blood into the cavity of the peritoneum. It is not unlikely that cases of this severe description are more common in India than in temperate countries: here they are certainly very rarely seen.

A pregnant woman, with a spleen appreciably enlarged, has a peculiar look which at once attracts the physician's attention. It is not exactly the appearance presented by a patient with malignant disease, and yet probably the first question which suggests itself to the observer is,—Has this person cancer? The complexion is sallow and unhealthy, there is a dingy discolora-

tion of the conjunctivæ, while the gums and inner surface of the lips are anæmic. The features are also somewhat pinched, the nose especially being sharp. The hair is thin, and comes away daily on being brushed. The appetite is generally indifferent, and the function of digestion is imperfectly performed. Mental depression is present. There is a liability to hemorrhage from the nose, gums, throat, and stomach; while if the patient suffer from hemorrhoids they are particularly apt to bleed with every attempt at passing a stool. When the blood is greatly altered from its natural condition, anæmic murmurs will be audible in the heart and large vessels. But abnormal præcordial dulness, with a loud cardiac bruit, may likewise arise from the enlarged spleen and uterus displacing the heart upwards, and preventing the free descent of the diaphragm and full expansion of the left lung.

The practical hints which I can give as to the management of these cases are few. It is hardly necessary to say that all lowering measures are to be avoided. But it is as well to remember that in every variety of splenic disease there is a tendency to hemorrhage; and consequently great mischief may ensue from the application of only a few leeches, or from the extraction of a tooth. In the event of abortion, moreover, extra precautions will be needed to prevent flooding. With regard to drugs, none but those belonging to the class of tonics are generally required. Occasionally, a dose of ether and opium at night may relieve painful restlessness. A pill containing some pepsine and rhubarb at dinner, will possibly assist digestion. But bark, or quinine, always proves serviceable; the dilute nitro-hydrochloric acid is grateful to the stomach, and also acts as a hæmostatic; cod-liver oil is invaluable where the stomach will tolerate it; while the cautious employment of some preparation of steel will often be attended with the best results, especially if plenty of nourishing food can be taken simultaneously.

8. Varices. Hemorrhoids.—A varicose condition of the veins of the lower extremities is a very common occurrence in multiparæ towards the latter part of gestation. Although rarely attended with danger, yet if the coats of the vessels become inflamed a very distressing and even formidable disease may be induced. These varices seldom appear in first pregnancies; but

generally perhaps commence during the second gestation, get worse in the third, and so on until they cause very great annoyance and even anxiety for fear of rupture. On examination, the knotted dilated veins are often found of an incredible size; while sometimes the whole network of superficial veins seems to be involved, especially those below the knee. A transverse position of the fœtus in utero may, by causing great pressure at the pelvic brim and so obstructing the returning current of blood, give rise to aggravated varices even in primiparous women. The cause being mechanical—*i. e.*, the pressure of the enlarged uterus—a cure during pregnancy cannot be hoped for; while, as a rule, any operation would be improper. Relief may, however, be given by properly bandaging the affected limb, or by the use of a well-made elastic stocking. The latter will especially be serviceable, provided its employment be commenced at an early period of the affection. Rest in the recumbent posture may also be enjoined in severe cases; and in all instances the patients should be cautioned against increasing the affection by the use of stays and garters, a simple suggestion which is generally neglected. Moreover, where there appears to be the least fear of a rupture of the coats of the vessel, it is advisable to explain to the woman and her friends how, in the event of its occurrence, pressure is to be applied below the wound; so that by this means the bleeding may be controlled until skilled assistance can be obtained.

A varicose condition of the vaginal veins is not unfrequently met with. If any one of these enlarged vessels should happen to give way, either spontaneously or from injury, a large quantity of blood gets effused into the connective and adipose tissues of the vulva; so that a considerable swelling rapidly forms, which is spoken of as a sanguineous tumor or thrombus. This tumefaction takes place much more frequently in the latter than in the earlier months of gestation; and still more commonly occurs during delivery, perhaps just as the head is about to pass. The accident is commonly announced by the sudden occurrence of great pain, rapid distension of the affected labium, and possibly syncope. The prognosis is unfavorable. M. Deneux states that of sixty-two instances brought to his knowledge, the mothers died in twenty-two, either before the end of gestation, or else during or after delivery; while all the infants of these twenty-two women likewise perished. Death is either caused by the

hemorrhage being profuse; or more rarely by the suppuration and gangrene which are not unlikely to follow the primary symptoms.

When the thrombus appears prior to the time of labor, and when the tumor is not larger, for example, than an egg, and is not increasing in size, it may reasonably be hoped that a coagulum has formed and that the hemorrhage is thereby arrested. Hence it will be better to trust to an expectant plan of treatment, in the hope that absorption may occur; although where the practitioner has faith in such things, he can unobjectionably apply cold evaporating lotions. But if the effusion be great, and the blood be still pouring out of the ruptured vessel, the tumor ought to be at once incised. In one case which came under my notice I was led to adopt this practice, because the blood was evidently making its way upwards, and the patient's condition warned me that any delay would be attended with extreme danger. After making a free incision externally through the integuments, and turning out a large clot, I pushed in a sponge thoroughly moistened with a solution of the perchloride of iron. All bleeding was arrested, and the patient did well; being afterwards safely delivered of a live child.

Hemorrhoids or piles, like varices, arise during pregnancy from the pressure of the womb on the hypogastric vessels; or they originate from prolonged constipation resulting in fecal tumor; or, in short, they are caused by any condition which impedes the natural return of the blood from the numerous vessels of the rectum. The symptoms produced both by external and internal hemorrhoids are too well known to need description here. Suffice it therefore to say that when small they usually cause slight uneasiness or pain, some itching with irritation, and occasionally a little bleeding after an evacuation of the bowels; the loss of blood more frequently proving beneficial than otherwise. When, however, the piles are large and inflamed they produce the most excruciating suffering and high sympathetic fever.

The indications for treatment are in all cases to keep the bowels moderately open; for which purpose, under the circumstances we are considering, castor oil will be found a more efficient laxative than any other medicine. If this aperient be very objectionable to the patient, a confection made of equal parts of sulphur, acid tartrate of potash, and juice of taraxacum may be substituted;

or the officinal confection of sulphur can be tried. Small enemata of tepid water are also occasionally useful. Where there is any hepatic derangement, or where engorgement of the portal system is suspected, the chloride of ammonium, in ten-grain doses thrice daily, can be recommended. To simple piles astringent lotions should be applied, or the ointment of galls and opium can be used; while the fundament ought to be thoroughly sponged with cold water after every stool. If, however, the tumor be inflamed, it may be necessary to put one or two leeches to it; to sedulously foment the parts with a very hot and strong solution of poppy capsules and chamomile flowers; to enjoin perfect rest in the recumbent posture; and to relieve the urgent distress by the internal administration of opium, after the rectum has been thoroughly emptied by an enema of castor oil. Supposing that an internal pile has been forced down and become strangulated, it should be well bathed with hot water and carefully returned; while if there be any difficulty in accomplishing the latter, the swelling ought to be punctured or scarified. Occasionally an external pile is found inflamed and distended by a coagulum. In this case a small incision, so as to let out the little clot in its delicate cyst, will afford immediate relief. Attempts at the radical cure of hemorrhoids during pregnancy should not be made. For it is most likely that after delivery a spontaneous cure will take place; while if this should not happen, the operation with the ligature will certainly be more successful when the pressure of the gravid uterus on the abdominal vessels is removed, than it can possibly be as long as the circulation is impeded by this body.

Section 3.—Disorders of the Nervous System.

1. Cephalalgia.—Pregnant women of all temperaments and constitutions are liable to attacks of severe pain in the head, attended with intolerance of noise and incapacity for exertion. These symptoms, if not dangerous, are at all events so distressing, that the aid of medicine is often sought for their relief.

The two chief varieties of cephalalgia are those dependent on debility, and those simply caused by sympathy with the changes going on in the uterine system. But of course it must not be forgotten, that as in the non-pregnant female so in the pregnant,

the headache may be due to general plethora and congestion ; or, to inflammatory action in the brain or its membranes ; or, to some organic change in the intercranial mass ; or, to disease of the bones of the skull ; or, to the presence of an active poison in the system, as that of gout, rheumatism, ague, &c. ; or, lastly, to some disorder of the stomach, liver, or bowels.

The headache dependent on debility is either constant, or it comes on in irregular paroxysms. It is more frequently of a dull aching character, than acute and throbbing ; while it is accompanied by intolerance of sound and perhaps of light. There may be drowsiness and giddiness. The skin is cool, and the pulse small and feeble. The eyes are dull ; while the face is pale, and does not become flushed as in the congestive varieties. In nervous women the pain is sometimes confined to one side of the head—hemicrania ; in which case it is usually most severe in the morning, often ceasing entirely as the evening approaches. The treatment of these cases is sufficiently simple. The due regulation of the digestive organs, a mild nourishing diet, gentle exercise in the open air, cheerful society, and the exhibition of mild tonics—occasionally of quinine and iron in small doses—always suffices to effect a cure. When the vital powers are much exhausted, the frequent administration of wine or any of the diffusible stimulants will do great good.

The sympathetic headache—clavus hystericus—is generally limited to a small space, or even to a single spot on the cranium ; the pain being described as resembling that of a wedge pressing into the brain. When prescribing for this form, care must be taken that the bowels are properly open. If purgatives are required, enemata of castor oil and turpentine and assafœtida and gruel will be found very efficacious. Then tonics, diffusible stimulants, or anodynes may be ordered. The extract of aconite in doses of about half a grain every four or six hours, sometimes gives more relief than other remedies. Cold evaporating lotions or eau de Cologne applied to the painful part, at least afford temporary relief.

2. Sleeplessness.—The problem,—What is sleep ? still remains to be solved by some future Œdipus ; physiologists and poets having as yet equally failed to define the exact nature and cause of that condition in which more than one-third of human

existence is consumed. "Half our days we pass in the shadow of the earth, and the brother of death extracteth a third part of our lives," says Sir Thomas Browne; and yet we really know but little of the complex and ever varying states of that which brings such indispensable comfort and renovation to both mind and body. Honest Sancho Panza, with his strings of misapplied proverbs, never spoke more to the purpose than when he said,—"But well I know, that while I sleep, I am troubled neither with fear, nor hope, nor toil, nor glory; and praise be to Him who invented sleep, which is the mantle that shrouds all human thoughts; the food that dispels hunger; the drink that quenches thirst; the fire that warms the cold; the cool breeze that moderates heat; in a word, the general coin that purchases every commodity; the weight and balance that makes the shepherd even with his sovereign, and the simple with the sage."[1] In contrast with this vulgar description, it may be worth while to quote a scientific definition by Dr. J. J. G. Wilkinson. Mr. Braid says that it is *interesting, as well as elegantly and lucidly expressed;* but it seems to me to have the one trifling fault of being perfectly unintelligible. The doctor says,—"The atom of sleep is diffusion; the mind and body are dissolved in unconsciousness; they go off into nothing, through the fine powder of infinite variety, and die of no attention; common sleep is impersonal."[2]

Whatever the nature of sleep may be, however, we are only now concerned with the causes which prevent, and the means which may be adopted to favor or produce it. Sleeplessness is often particularly distressing to pregnant women, and when obstinate or continued for any length of time leads to serious constitutional disturbance. This circumstance is not surprising when the misery of a long and weary restless night is remembered. In puerperal cases, insomnia is not unfrequently the precursor of delirium or mania. The women who suffer from an inability to sleep during pregnancy are frequently of a nervous temperament, and such as are easily excited. It is well known that mental occupation when moderate causes sleep, but when excessive prevents it. Deficient exercise, with a constant resi-

[1] Don Quixote. Part ii, Book v, Chapter 16.

[2] On Magic, Witchcraft, Animal Magnetism, Hypnotism, and Electro-Biology. By James Braid, M.R.C.S.E., &c. Third Edition, p. 54. London, 1852.

dence in a close and overheated atmosphere, produces fever and loss of sleep. So also dyspepsia, in all its forms, is a fertile source of restlessness. Hence, to secure repose which may be refreshing and renovating to both mind and body, a proper amount of exercise ought to be taken during the day; the diet must be digestible, and especially such as will not favor the production of flatulence or acidity; and no tea or coffee should be allowed in the after-part of the day. In many cases I have seen benefit from the dinner being taken about half-past one or two o'clock in the afternoon, as was the old-fashioned custom; while a light supper has been enjoyed about an hour before bedtime. The patient should retire to rest at an early and regular period; the apartment ought to be quiet, and proper means taken to have it well ventilated; and if the weather be at all chilly, a fire may often be kept up during the night with great advantage. Although a very low temperature predisposes to somnolence, yet I am sure that the moderate degree of cold which we have for six or eight months in this country has the reverse effect with many delicate individuals. The bed had better generally consist of a mattress, without too many heavy blankets; the pillows must not be high; and no curtains or hangings should be permitted.

If attention to these simple rules fails to produce the desired effect, one or other of the following different plans may be practised perhaps somewhat empirically. For example, it has frequently happened to me to see a good result, particularly when there has been any debility, from a tumblerful of port wine negus, or of mulled claret, or of white wine whey being taken the last thing at night. In other instances, where the skin has been hot and dry, a glass of cold water has appeared to be useful. So, again, the employment of a bath for about three or five minutes, at a temperature varying from 90° to 96° F., just before going to bed often affords relief; as does also a rapid sponging of the body with tepid water. The reading of exciting works of fiction late in the evening is to be prohibited; and everything that is possible should be done to remove anxiety, or to allay any feeling of apprehension which may exist as to the result of the approaching labor. Where any physical cause for the wakefulness can be discovered, it must of necessity be removed. Thus, supposing the bowels to be constipated, or the excretions to be unhealthy, laxatives and alteratives will be required; though it is

as well to remember, that owing to the close dependence of sleep on the condition of the alimentary canal the exhibition of purgatives at bedtime should be avoided, under the special circumstances we are now considering. These measures failing to procure the *somnus qui faciat breves tenebras*, sedatives are to be carefully resorted to; and as conium, hop, henbane, and lettuce neither affect the head nor confine the bowels, they should first be tried. But not unfrequently stronger drugs will be needed: and then a quarter of a grain of morphia with a few minims of the compound tincture of chloroform, or half a grain of the extract of opium with three or four grains of hyoscyamus, or twenty drops of the liquid extract of opium with half a fluid drachm of the spirit of ether will be found useful forms.

With regard to the plans recommended by authors who have specially written on sleep, I may say—having often experienced the truth of Madame de Sévigné's remark, that there are twelve hours in the day and fifty in the night—that I have tried them all without the least benefit. Indeed, to speak the truth, it has seemed that "Nature's soft nurse" has been more certainly propitiated by reading the writings of some of these gentlemen, than by internally repeating some half-dozen times any popular rhyme, or by slowly counting up to one thousand, or by directing the eyes and thoughts to any one fixed spot, or by taking deep inspirations and allowing the imagination to stray until the breath could be seen passing in a continuous stream from the nostrils. However, as the best of these schemes may perhaps succeed with some nervous women, and as they have the recommendation of being harmless, their authors may be allowed to speak for themselves. First then, Mr. Braid says: "A method of producing *sleep at will*, however, *without the use of opiates*, may be most advantageously resorted to, on certain occasions, by *most people;* and I shall therefore briefly describe the method devised by me for that purpose. In my work on Hypnotism, published in 1843, I explained how 'tired Nature's sweet restorer, balmy sleep,' might be procured, in many instances, through a most simple device by the patient himself. All that is required for this is simply to place himself in a comfortable posture in bed, and then to close the eyelids, and turn up the eyeballs gently, as if looking at a distant object, such as an imaginary star, situated somewhat above and behind the forehead, giving the whole concentrated

attention of the mind to the idea of maintaining a steady view of the star, and breathing softly, as if in profound attention, the mind at the same time yielding to the idea that sleep will ensue, and to the tendency to somnolence which will creep upon him whilst engaged in this act of fixed attention. Or it may be done with still more success, in certain individuals, by their placing some small, bright object in a similar aspect, with a distant light falling thereon, the party looking at the object with open eyes, fixed attention, and suppressed respiration. Other modes of producing a state of mental concentration, directed to some unexciting and empty thing, and thus shutting out the influence of other sensible impressions, may also prove successful for inducing calm sleep, by monotonizing the mind—just as we see effected in the case of children, who are sent to sleep by rocking, patting, or gentle rubbing, or monotonous unexciting lullabies—but none are so speedy and certain in their effects, with patients generally, as the modes which I have briefly explained."[1]

Another mode of winning sleep is described by Dr. Binns, who thinks it will succeed when all other plans have failed: The sufferer is to turn on his right side, "place his head comfortably on the pillow, so that it exactly occupies the angle a line drawn from the head to the shoulder would form, and then slightly closing his lips, take rather a full inspiration, breathing as much as he possibly can through the nostrils. This, however, is not absolutely necessary, as some persons breathe always through their mouths during sleep, and rest as sound as those who do not. Having taken a full inspiration, the lungs are then to be left to their own action—that is, the respiration is neither to be accelerated nor retarded too much; but a very full inspiration must be taken. The attention must now be fixed upon the action in which the patient is engaged. He must depict to himself that he sees the breath passing from his nostrils in a continuous stream, and the very instant that he brings his mind to conceive this apart from all other ideas, consciousness and memory depart; imagination slumbers; fancy becomes dormant; thought ceases; the sentient faculties lose their susceptibility; the vital or ganglionic system assumes the sovereignty; and as we before remarked, he no longer wakes but sleeps. For the instant the

[1] On Magic, Witchcraft, Animal Magnetism, Hypnotism, and Electro-Biology. Third Edition, p. 91. London, 1852.

mind is brought to the contemplation of a single sensation, that instant the sensorium abdicates the throne, and the hypnotic faculty steeps it in oblivion."[1]

When the rest is disturbed by frightful dreams but little benefit can be derived from the repose, while occasionally positive mischief is done. One lady is known to have had such fearful dreams that she was obliged to employ a nurse to sit by her bedside at night to watch her countenance; so that if it became alarmed or disturbed, she might at once be awoke. Mauquest de la Motte relates an instance where a patient in the ninth month of her first pregnancy dreamed that she saw a frightful spectre, which insisted upon lying down beside her. She awoke in great horror, and was immediately seized with labor pains. At the end of thirty-six hours she was so exhausted, that it was found necessary to terminate the labor; the child being stillborn, and the mother dying two hours afterwards.

3. Hypochondriasis.—Amongst the other anomalous symptoms which may follow on gestation, it is necessary to notice that feeling of despondency which occasionally takes possession of a woman's mind; leading either to an undefined apprehension of present danger, or to the almost ever-present idea that her labor will certainly end fatally. These attacks of mental depression are by no means natural; for every physician knows not only with what confidence a woman usually looks forward to the time of parturition, but with what reliance and fortitude she bears a large amount of suffering. Hence I confess, that when I see a patient frequently in tears, evidently unhappy, losing all interest in life, and anticipating nought but danger from her labor, some anxiety is felt for the result; for more than once it has been proved that these forebodings were not altogether groundless. In such cases it is above all things important, that no weakening plan of treatment be put in force; no suspicion of congestion or inflammation of the brain is to mislead the practitioner into prescribing drastic purgatives, mercury, iodide of potassium, or antimony. But any derangement of the bodily health must be cautiously looked to; and if—as is not unfrequently the case—there is slight fever, bad appetite, loaded

[1] The Anatomy of Sleep. Second Edition, p. 435. London, 1845.

tongue, foul breath, nausea, and irregularity of the bowels, then mild laxatives will be needed, and subsequently such medicines as are calculated to impart tone to the digestive organs.

The drugs which I have especially found useful in mitigating attacks of hypochondriasis are rhubarb and soda, solution of strychnia and citrate of iron, spirit of chloroform with quinine and some bitter infusion, and phosphate of ammonia or soda with nux vomica. A dose of pig's pepsine, with the two chief meals of the day, not only assists the assimilation of food, but also allows such a tonic as the following to be given with advantage, where without some aid to digestion it could not perhaps be borne:

Take of,—Aromatic Spirit of Ammonia, 3 fluid drachms; Spirit of Chloroform, 1 to 2 fluid drachms; Citrate of Iron and Quinia, 30 grains; Solution of Strychnia, 30 minims; Tincture of Ginger, 2 fluid drachms; Water, to 8 fluid ounces. Mix and label,—"One-sixth part twice or three times a day."

Another form which is sometimes useful when a tonic with a mild alterative is indicated, may run thus:

Take of,—Chloride of Ammonium, 40 grains; Liquid Extract of Yellow Cinchona, 90 minims; Wine of Rhubarb, 6 fluid drachms; Peppermint Water, to 8 fluid ounces. Mix and label—"One-sixth part twice a day."

The moral management of these cases is, however, almost as important as the purely medical. If fears are entertained by the patient merely as to the amount of pain which has to be gone through, we can happily undertake to give complete immunity from suffering by the exhibition of the vapor of pure ether or of chloroform; or of what is very much better than either singly, a mixture of the two in equal proportions. The dread of bodily anguish has sometimes so upset the balance of the mind as to produce really alarming symptoms, amounting perhaps to a form of monomania. Reasoning or persuasion here does no good. A positive assurance of our power to annul all discomfort, without risk, must be given; and it is often an act of kindness to offer the assurance in writing, so that it may be read again and again when the attacks of despondency come on in the physician's absence. Should the apprehension of danger to life be the cause of the attack, the practitioner will likewise do well to promise to be by his patient's side from the beginning until the completion of the labor. A humane and sympathizing

demeanor almost always instils hope and confidence into the woman's mind; and he who has seen the good effect of thus imparting courage will not regret any little extra trouble which may be necessary. Moreover, hypochondriacs should not be allowed to witness any scenes of real or imaginary distress; and amiable, though perhaps not discreet friends, may be warned against relating the exaggerated histories of any bad accouchements with which they happen to be acquainted.[1]

When these manifestations of despondency and dread continue to be exhibited after the process of parturition is safely completed, it is to be feared that they may be due to some serious cerebral derangement; which, if it exist, is not at all unlikely to end in an attack of puerperal mania, or even of confirmed melancholia.

4. Nervous Affections of the Ears and Eyes.—It has happened in some very few instances, that the sensitiveness of the auditory nerves has been rendered painfully acute by pregnancy. More frequently, the opposite condition has been noticed; and the power of hearing has been gradually or suddenly abolished during the earlier months of gestation. The deafness has occasionally persisted for a few weeks: in other cases, the sense of hearing has only been gradually recovered after parturition. An examination of the ears and throat has disclosed nothing unhealthy. In the reports which have been published of these examples of nervous deafness, the state of the urine is not mentioned. For the future, this secretion ought always to be examined for albumen and for sugar.

For many years obstetric physicians have been familiar with the fact, that pregnant women affected with albuminuria are liable to suffer from different lesions of the nerves connected with vision. Thus cases are recorded where severe pains have been felt, either continuously or at regular intervals, in the orbit; or where strabismus has first shown itself; or where the eyes have been rendered preternaturally weak; or where there has been double vision; or even where the retina has become temporarily insensible to every stimulus, producing complete amaurosis.

[1] The reader will find some further observations on the conduct of women during pregnancy in the author's Practical Treatise on the Diseases of Infancy and Childhood, pp. 9 to 15. London, 1858.

These cases of amaurosis are especially remarkable. The instance of the Jewess, reported by Beer, has already been noticed (p. 143). Dr. Lever has published the history of a woman pregnant with her fifth child, and who, soon after quickening, suddenly felt a peculiar sensation in the eyeballs. On opening the lids, she could merely see the outline of objects, their centre being totally dark. The pupils were large and sluggish; while the eyeballs seemed to have lost their mobility, and to have become inordinately fixed. After labor at the full term, everything was done to impart strength to her system, and with success. At the end of three months she could see perfectly.[1] The notes of three examples have been recorded by Dr. Robert Lee; in one of which labor was artificially brought on. Dr. Churchill also met with a case at the eighth month of pregnancy, in which the symptoms became so urgent that premature labor had to be induced. Dr. Spengler was consulted by a healthy woman who became suddenly blind in her fourth pregnancy, but who recovered completely after delivery at the full time; the urine was free from albumen. And lastly, Dr. Eastlake has given the particulars of a remarkable case, in which amaurosis occurred eight times in succession after natural labors, and continued for from three to five weeks on each occasion.[2]

Generally speaking, medical treatment fails to give any decided relief to these disorders. They will continue in spite of all remedies until after parturition; and then they pass off spontaneously. Such tonics as quinine and steel, with nourishing food and cod-liver oil, must effect partial good, however, even though they will not accomplish all we can desire. The chief point is to be able to assure the patient that she may almost certainly reckon upon delivery leading to a cure. Whether the gestation is to be allowed to go on until the natural time for its termination must depend upon circumstances. I think, however, it may be laid down as an axiom that premature labor ought to be induced if an ophthalmoscopic investigation reveals the presence of any destructive disease in the choroid or retina; or if, from the state of the nervous system, the supervention of convulsions be feared; or again, if the amount of albumen in the urine is persistently large, and is seriously deranging the general health. During

[1] Guy's Hospital Reports. Second Series, vol. v, p. 17. London, 1847.
[2] Transactions of the Obstetrical Society of London. Vol. v, p. 79. London, 1864.

the process of parturition every possible precaution should be taken to prevent anything approaching to flooding. And again, if the child be born alive, the mother must not be allowed to suckle it.

5. Mastodynia, or Pain in the Breasts.—Nervous and irritable women not unfrequently suffer from severe neuralgic pains in the breast soon after conception. As pregnancy advances the breasts become gradually enlarged and rather hard; while the tension and pain are sometimes intolerable. This suffering gives rise to sleeplessness, loss of appetite, general agitation, and anxiety lest cancer be commencing. Occasionally, the engorgement ends in inflammation and suppuration. Not unfrequently, the pain radiates from the breast and affects the side of the neck and head, or the shoulder, or the muscles down the dorsal region of the back. Sometimes, it is described as being dull and heavy; while in other instances it is so sharp and acute that the patient fears to move. It may disappear for a few weeks and then return; or it perhaps assumes an intermittent character, coming on at a certain hour every night or every other night. There is generally no tumor, nor any appreciable alteration in the structure of the gland.

These pains are often difficult to relieve. Emollient poultices, anodyne lotions, the application of the extract of belladonna, and friction with the iodide of lead ointment to which some extract of opium has been added, are the chief remedies. Antacid laxatives and rest will be necessary. The valerianate of iron, or of zinc, can be recommended; as can also the tincture of actea racemosa with small doses of aconite. Cod-liver oil has relieved some cases which have resisted all other remedies. If the suffering occurs with any degree of periodicity, quinine will often prove beneficial. When the nights are restless, conium, or henbane, or Indian hemp, or opium, ought to be given. Should an abscess form, it must be opened. When the mammæ are large and heavy they had better be supported with a bandage; for the mere dragging of a voluminous breast may produce neuralgia. Mental relief will always be given by calming the patient's fears as to the nature of the disease; since it is worthy of recollection, that directly a nervous woman has pain in her breast she usually concludes it must be due to cancer.

6. Pain in the Right Side.—Few ailments are more harassing while they last than this one of acute pain, coming on more or less suddenly, in the right side. Hence it is fortunate that the affection is not common. In order that the student may not mistake the nature of this pain when he is called upon to treat it, I would ask him to carefully consider the details of the following case, which may be taken as a typical example of this disorder. We will imagine that he has been just summoned to the sick-room, that the time is the evening, and that he has before him a patient advanced to the eighth month of pregnancy. He is told that until the last week the general health has been good; but that there has been some annoyance from the presence of varicose veins, and perhaps from swellings of the legs. He sees the woman on her bed, occupying a semi-recumbent posture, and leaning towards the left side. Every inspiration and cough causes pain, and the least movement makes the sufferer almost shriek. To sit up, or to turn over to the right side, is impossible, such is the agony these positions give rise to. The surface of the body is bathed in sweat, the pulse is quick, the tongue furred, the countenance distressed and anxious; while an earnest cry for relief is made. The bowels have only been slightly open, and the evacuations have been almost black and very offensive. The urine is free from all albumen or sugar, but is probably loaded with urates. All the pain is seated on the right side, about the edges of the false ribs; in fact, over the right hypochondriac region. It is of a stabbing or stinging nature; and though it has been slightly felt during the last day or two, it is only on this particular evening that it has become quite unbearable. "Is it inflammation of the liver?" she gasps out. Clearly not. For pressure does not aggravate the suffering; there is neither jaundice, vomiting, nor hiccough; no sympathetic pain in either shoulder is experienced; and instead of there being any inability to lie on the left side, this is the only position—except standing upright—that can be borne. "There must be inflammation of the lung then, or pleurisy?" No, there can be neither. Observe the respiratory murmur, it is quite healthy; there is certainly cough, but no expectoration; and the pulse, though quick, is not hard like that of pneumonia or pleurisy. "What is it then, which causes this dreadful torture?" The explanation is difficult; but it is probable that the pain is owing to the pressure of the

ascending uterus interfering in some incomprehensible way with the liver. I say "difficult," "probable," and "incomprehensible," advisedly; because I have seen the abdomen occupied by tumors quite as large as the uterus at the full term, but have never found them give rise to similar acute symptoms. However, whatever the nature of the affection may be, making the sufferer lie on her left side, covering the region with equal parts of the extracts of belladonna and poppies, together with very hot fomentation flannels, and the administration of the following draught, will soon afford relief:

Take of,—Spirit of Ether, 30 minims; Compound Tincture of Chloroform, 20 minims; Syrup of Poppies, 1 fluid drachm; Tincture of Indian Hemp, 15 minims; Liquid Extract of Opium, 15 to 30 minims; Tincture of Capsicum, 10 minims; Mucilage of Tragacanth, 6 fluid drachms. Mix for a draught, to be taken immediately.

The practitioner may now leave his patient, feeling tolerably certain that she will enjoy a good night's rest. On the following day it will be quite time enough to get the alimentary canal cleared out by a full dose of mercury and chalk with rhubarb, or by a draught containing sulphate of soda and taraxacum, or by the administration of six or eight drachms of castor oil. The morphia will very probably have to be repeated for the next few nights; a nutritious diet will necessarily be ordered, perhaps with stimulants; and the patient must be warned to seek immediate advice if the bowels again become constipated, or if the motions assume an unhealthy character. Moreover, as long as a vestige of pain remains, she should be kept in bed; being directed to lie on her left side, so as to keep the uterine tumor as much away from the liver as possible. While there is any uneasiness, sitting up will assuredly increase it; since this posture brings the gland forward and downward on to the uterus.

The foregoing cases of acute pain in the right side must not be confounded with those instances of chronic pain just below one or other breast, which almost equally affect the pregnant and non-pregnant female. If the seat of suffering, in one of these chronic cases, be examined, it will probably be found that the pain is confined to the tendinous insertions of the rectus abdominis muscle into the cartilages of the fifth and sixth and seventh ribs. In a like manner, Dr. Inman has shown that myalgic

pain is not unfrequently experienced in the insertions of the same muscle into the crest of the pubic bone and the ligaments covering the symphysis pubis. It can easily be understood that these pains may arise from many causes in delicate women; though they seldom prove more wearying than where there has been long-continued stretching of the rectus by the gravid womb, or by a large uterine or ovarian tumor. The necessary treatment is obvious. Tonics, nourishing food, the avoidance of fatigue, and frictions with sedative liniments will afford relief; but so long as the cause continues in action, so long the patient must expect to feel the annoying effects.

CHAPTER XI.

THE DISEASES OF THE URINARY AND GENERATIVE ORGANS.

SECTION 1. DISEASES OF THE URINARY ORGANS.—1. INCONTINENCE OF URINE.—2. RETENTION OF URINE.—3. URÆMIC ECLAMPSIA.

SECTION 2. DISEASES OF THE GENERATIVE ORGANS.—1. PRURITUS OF THE VULVA.—2. ŒDEMA OF THE LABIA.—3. VAGINAL LEUCORRHŒA.—4. DISCHARGE OF WATERY FLUID FROM THE UTERUS.—5. DROPSY OF THE AMNION.—6. RHEUMATISM OF THE UTERUS.—7. INFLAMMATION OF THE UTERUS.—8. UTERINE HEMORRHAGE.

SECTION 1.—DISEASES OF THE URINARY ORGANS.

1. INCONTINENCE OF URINE.—During the early months, the pregnant woman is usually tormented with a frequently-recurring desire to pass water; and unless she be able to gratify this desire at once, the urine is very likely to come away involuntarily. In these cases, the incontinence is probably due to the congestion and irritation from which all the pelvic viscera suffer, owing to the important series of changes which is progressively taking place in the uterine cavity; or it may arise from the pressure which the gradually enlarging womb, before rising out of the pelvic cavity, must necessarily exert on the posterior wall of the bladder. Still more common, however, is incontinence at a much later period; when a temporary paralysis of the vesical coats may be induced by the pressure of the enlarged uterus. The urine then very frequently escapes involuntarily, especially on coughing; and great distress ensues from the vulva and upper part of the thighs becoming excoriated by this secretion. Moreover, no little annoyance, both to the patient and her friends, is produced by the strong urinous odor which attaches to the clothes.

In the treatment of the *first* class of cases, only simple remedies will be required. A cure may not unfrequently be effected by the application of fomentations, and the exhibition of a dose or two of the extract of henbane; or sometimes by the administration of the extract of belladonna in half-grain doses twice a day. Mild laxatives must also be ordered if the bowels are not free.

The diet ought to be plain and nourishing; all kinds of malt liquors being forbidden, while milk and cocoa are to be taken instead of tea and coffee. In the *second* instance we can only palliate the symptoms until the time of delivery arrives. Frequent sponging of the vulva with cold or tepid water should be enjoined. The sufferer had better empty the bladder very frequently, to prevent any accumulation and involuntary discharge of urine. The upper part of the thighs, &c., should be protected from the excoriating effects of the secretion, by painting them with a soothing artificial cuticle made of two parts of castor oil to one of collodion, or with the officinal flexible collodion. The practitioner must not forget that a very frequent desire to pass urine is one of the urgent symptoms of calculus. Hence if the secretion contain blood or mucus, or if immediately after micturition the desire to urinate still continue, it is important that the bladder be carefully examined with the sound. It need hardly be added, that where a stone is discovered it must be crushed with a lithotrite and removed; unless, indeed, it be of a very small size, and then perhaps the urethra may be sufficiently dilated to get it away without any fear of bad consequences, the patient being unable to retain her urine for the future. But the operation of lithotrity in women is comparatively so simple, that nineteen times out of twenty it is greatly to be preferred to extensively dilating or slightly incising the urethra, as well as to vaginal lithotomy.

2. Retention of Urine.—The pressure of the uterus upon the neck of the bladder may be so great as to render the emission of urine difficult or even impossible. Dysuria may thus arise at any period of pregnancy. It is, however, most frequent towards the end of gestation, probably owing to the uterus then falling forwards with greater force, and so compressing the neck of the bladder against the margin of the symphysis pubis. Anteversion and retroversion of the uterus likewise interfere with the normal performance of the functions of the bladder.

If the retention depend simply on the pressure of the womb, and if the vesical coats have not lost their tone from long-continued distension, the bladder may generally be voluntarily emptied by the woman lying upon her back with a bed-pan beneath the buttocks. But if this simple plan be found to fail, the cath-

eter must be used. It has not very unfrequently happened, that from some error in diagnosis the bladder has been allowed to become so distended as to reach the umbilicus, giving rise to the greatest suffering. Of course rupture ultimately takes place unless proper treatment be adopted: and even if the urine be withdrawn, still there is no little fear of inflammation setting in, from the great irritation to which the coats have been subjected. In all those cases, therefore, where the practitioner finds, without the presence of any apparent cause, such symptoms as pain at the lower part of the abdomen, a frequent desire to pass small quantities of water, thirst, loss of appetite, heat of skin, and a frequent pulse, he ought to direct his attention to the state of the bladder. He had better introduce a catheter unnecessarily, than fail to do so when it is urgently needed. But if he wish to temporize, he should at least see the quantity of urine which is passed in the twelve or twenty-four hours, so as to be sure that there is not merely a frequent dribbling from an over-distended bladder.

3. Uræmic Eclampsia.—The gradual manner in which valuable pathological facts are brought to light is well illustrated by a consideration of the subject of the present section. Some fifty years have elapsed since Hamilton first gave the clue to a correct recognition of the nature of puerperal convulsions by showing that they were often preceded by the occurrence of anasarca during pregnancy. About 1840, Dr. Lever and Sir James Simpson proved—as was to be inferred from the researches of Dr. Bright—that this anasarca was connected with the existence of albuminuria; and until the investigations of Dr. Braun, we learnt but little more. Even now much has to be done; and it is important yet to ascertain, amongst other points, the various circumstances which give rise to the albuminuria and the retention of urea in the blood. That puerperal convulsions are not always due to actual renal disease is quite certain. We have two classes of cases in which these attacks occur—viz., those in which the albumen disappears from the urine two or three days after delivery, and those in which it is permanent from structural disease of the kidney. Moreover, it must not be overlooked that many patients suffer from either temporary or persistent albuminuria who never have any uræmic symptoms developed during pregnancy or parturition.

The term uræmia is employed to denote a peculiar kind of poisoning, which is supposed to result from the accumulation of urea in the blood, and perhaps from the transformation of this salt into carbonate of ammonia. The direct effects of this poisoning are seen in a disturbed action of the two great nervous centres—the brain and spinal cord. These centres may be affected either separately or together. Hence we have three forms of uræmic poisoning: (1) That in which a state of stupor supervenes rather abruptly, and from which the patient is aroused with difficulty. It is soon followed by complete coma, with stertorous breathing, as in ordinary poisoning from opium. (2) The variety in which convulsions of an epileptic character suddenly set in, often affecting the entire muscular system. Consciousness remains unimpaired. And (3) that kind in which coma and convulsions are combined.

The occurrence of albuminuria during pregnancy is a rare event. It may, however, be found in every period of pregnancy, though it is seldom detected before the fifth month. Most commonly it is met with about the latter weeks, but sometimes it only sets in during labor. When due to gestation—in other words, when there is no structural disease of the kidney—this condition generally disappears a few hours after labor is over. The relative frequency of this state of urine, according to the investigations of M. Blot, who analyzed the renal secretion of 205 women taken indiscriminately in the wards of the Maternité, is one in five: that is to say, of the number examined, forty-one had albuminuria. I believe, however, this proportion is considerably higher than holds in our own country. Of the 205 cases, 106 were multiparæ, and the urine of 11 of these contained albumen; while 99 were primiparæ, and the secretion of 30 of this class was albuminous. Hence the proportion in multiparæ is, in round numbers, one to ten; whilst in primiparæ it is one to three. During Dr. Collins's mastership at the Dublin Lying-in Hospital there were 30 cases of puerperal convulsions, and 29 of these were primiparæ. The quantity of albumen varies very much. Thus in one set of cases, the urine is found to present all the characters which it assumes in acute desquamative nephritis; being scanty, of a dark smoky color, of a high specific gravity, and loaded with albumen. Then in a second class, the secretion is found to be pale, of a low density, with its salts di-

minished, and having the characters of the urine in chronic desquamative nephritis, or in fatty degeneration of the kidney.

There is a great difficulty in accounting for the albuminuria of pregnant women. Many practitioners regard it as due to active congestion of the kidneys produced by the pressure of the uterus, and the mechanical obstacle which this compression necessarily opposes to the return of the venous blood. The most telling fact in favor of this explanation is the frequency of uræmia in primiparæ, in whom the abdominal walls are firm and resisting. Yet it is certain that this phenomenon is sometimes observed under circumstances, and at periods of pregnancy, when this explanation will not suffice; while it is not witnessed in the case of large ovarian tumors, the pressure of which is quite equal to that of the gravid womb at the full term. The real cause must be sought elsewhere. It has been very plausibly suggested—I believe by Dr. Barnes—that the albumen found in the urine is the result, and an indication, of the degradation of the mother's blood; which degradation is wrought, chiefly at least, by the obstruction of its healthy elements in the placenta, and the reception of the effete materials of the fœtus, discharged into it through the same organ. This view, though not entirely satisfactory, seems to me more reasonable than that of M. Blot, who gives as the probable cause a nervous irritation of the kidneys, sympathetic of pregnancy. Equally to be distrusted is the opinion of many that the cause is to be found in the restraint which pregnancy opposes, after a certain time, to the freedom of respiration. The upholders of this theory assert, that modern chemistry shows how the albuminous matters undergo in the blood, under the influence of the oxygen, a combustion which leaves two bodies of azote—urea and uric acid—to be eliminated by the urine; but if from any cause this combustion be interrupted, the albumen instead of coming away in the urine as urea, is passed unchanged. This results only in pregnancy in the same way as it happens in a certain number of pathological states accompanied by impeded respiration and circulation; as is seen in organic lesions of the heart, acute pneumonia, cholera, &c.

When the albuminuria is due to acute desquamative nephritis, or to fatty or amyloid degeneration of the kidney, the occurrence of uterine congestion and placental apoplexy and abortion is, I believe, more to be feared than the setting in of uræmic convul-

sions. During the twelve years ending in June, 1860, I had myself attended seven women in labor, all of whom were suffering from true Bright's disease in a more or less advanced stage. Not one of these had even any threatening of uræmia at the time of delivery, or had previously experienced symptoms which might be regarded as warnings; but four had aborted at an early stage of gestation, and one had even miscarried three times in succession. Another of these cases was also seized with convulsions three weeks after an easy labor, from which she gradually recovered; afterwards remaining free from acute symptoms and in the enjoyment of moderate health for several months, though her urine was loaded with albumen, and to my certain knowledge had been so for the previous five years.

The uræmic fits do not arise, as was formerly thought to be the case, from the blood being poisoned simply by urea. The views of Frerichs have been confirmed by Dr. Braun; and it now appears highly probable that the phenomena of uræmic convulsions are not produced by urea nor any other ingredient of the urine, but that they commonly originate from the urea retained in the blood being transformed into carbonate of ammonia under the influence of some peculiar ferment. Hence can be explained those cases, where women suffering from Bright's disease pass through pregnancy and labor—their blood being saturated with urea—without any uræmic phenomena taking place; simply because the unknown ferment, by means of which the urea can be changed into carbonate of ammonia, is absent. The same interpretation must be put on those experiments on animals, in which the injection of urea into the veins has failed to produce convulsions. Frerichs states that he has proved, by chemical analysis, the existence of carbonate of ammonia in the blood in all cases in which the symptoms of uræmia have been developed. He further observes that the two following propositions can be demonstrated beyond a doubt: (1) That in every case of uræmia, a change of urea into the carbonate of ammonia takes place. (2) That the symptoms which characterize uræmia can all be produced by the injection of carbonate of ammonia into the blood.

The attacks of convulsions commonly appear for the first time during the last three months of gestation; or more particularly just before the process of parturition commences, or while labor

is going on. It is from this latter circumstance, that they are often spoken of as "puerperal convulsions." They are frequently preceded by symptoms which should put the practitioner on his guard; the most prominent being headache, giddiness, various kinds of illusions, noises in the head, marked mental depression, nausea and retching, languor, rigors, and weakness of the extremities. The urine has generally been albuminous for some time previous to the convulsions; although a few cases are recorded where the albumen has only been found shortly after the first fit. The albumen being abundant in the urine, it may be taken for granted that the urea is proportionately scanty; so that as the blood becomes deficient in albumen its impurity gets greater. In addition to the albuminous state of the urine, the face and hands and arms will generally be found œdematous; or this condition may perhaps chiefly affect the feet and ankles, or the labia majora. When the fits once come on, they usually follow each other in rapid succession, being often repeated several times in the day; the patient being not only insensible during the paroxysm, but most frequently also in the interval. The duration of each fit, inclusive of the stage of convulsion and that of coma, varies from half an hour to two or three hours, or even longer. As the symptoms remit, consciousness returns very gradually; a confused dull headache being complained of, though there is no recollection of what has happened. It is quite certain that eclampsia can appear quite independently of uterine pains. The fact has been observed by many, that the fits may cease and pregnancy go on safely for weeks until the proper period of parturition arrives; or even if pains have set in, they may completely pass off for one or two days. Yet it must also be allowed that spontaneous premature labor is not uncommon with eclampsia

The life of the child is much endangered by the attacks of convulsions. It is quite exceptional for the fœtus to be found alive after numerous paroxysms. Dr. Braun says:

> The cause of death of the fœtus of eclamptic mothers is, for this reason, chiefly to be sought for in the passage of carbonate of ammonia into the fœtal circulation. But the uræmia itself of the mother may, without eclampsia occurring, destroy the fœtus, as we have observed in acute Bright's disease of pregnant women without eclampsia. Besides the uræmic poisoning of the blood, other injurious influences may endanger the life of the fœtus, as interruption of the placental circulation by violent pains, in cases where in-

superable difficulty is produced by transverse presentations, disproportion in size, pressure on the cord, premature discharge of the waters, and deficient preparation and softening of the neck of the womb. Albuminuria and Bright's disease of the kidneys of children born of eclamptic mothers, have been observed by Simpson. We have not unfrequently observed apoplectic masses in the cavity of the skull and spine in cases of children dying of convulsions in the first days of life.[1]

When the mother dies during pregnancy from eclampsia puerperalis the result of uræmic toxemia—in other words, from convulsions caused by the action of morbid blood on the brain and spinal cord and medulla oblongata—and the Cæsarean section is immediately performed, the infant will almost always be found dead.

Uræmic eclampsia is to be distinguished from other convulsive diseases by the albuminous state of the urine, by the œdematous infiltrations of the face or extremities which are generally present, and by the precursory nervous symptoms which have been already alluded to. It is likely to be confounded with cholæmic eclampsia; an acute disorder that arises from the blood being overcharged with the constituents of the bile and the products of their decomposition, and which is connected with acute atrophy of the liver, icterus typhoides, pyæmia, as well as with some forms of puerperal fever. But in the case of cholæmia the urine does not contain albumen, while it is charged with biliary pigment; the presence of the latter being ascertained by the production of the well-known play of colors on the addition of nitric acid. So also hysterical convulsions may occur, but they have no injurious effect on the mother or child: women afflicted with epilepsy often have the fits recur during pregnancy: there are the convulsions which originate in meningitis, encephalitis, apoplexy, or tuberculosis of the membranes of the brain: while there may be the same from the ingestion of poisonous substances, such as strychnine or brucine. But the simple fact that in these cases all uræmic symptoms are wanting is sufficient to prevent their being mistaken for convulsions due to poisoning of the blood with urea, or with this salt when converted into carbonate of ammonia.

[1] The Uræmic Convulsions of Pregnancy, Parturition, and Childbed. By Dr. Carl R. Braun, Professor of Midwifery, Vienna, p. 48. New York, 1858. Translated by Dr. J. Matthews Duncan, from the Lehrbuch der Geburtshülfe mit Einschluss der operativen Therapeutik, der übrigen Fortpflanzungs-functionen der Frauen und der Puerperal processe. Wien, 1857.

The prognosis in eclampsia must always be guarded; since hitherto, according to Braun, thirty per cent. of the cases have proved fatal. The greater the difficulty in diminishing the volume of the uterus, the greater is the danger. The fits have been found to cease completely after evacuation of the uterus in thirty-seven per cent., to become weaker in thirty-one per cent., and to continue of the same severity in only thirty-two per cent. The case may be said to assume a favorable aspect where the fits steadily diminish in frequency and violence; more especially if the pulse continues quiet and of its natural strength, if there be abundant diuresis, if all comatose symptoms disappear, and when no secondary disease of the brain or lungs has been produced. It is fortunately true, that when convulsions have occurred in one pregnancy it is quite the exception for them to happen in subsequent gestations.

Supposing the foregoing hypotheses, on which so much stress has been laid, to be well founded—and I know of no good reasons for doubting their correctness—the indications for treatment are clear and simple. When the existence of albuminuria is discovered during pregnancy, medicines should be administered which will prevent the decomposition of the urea, or rather will neutralize the carbonate of ammonia if it be formed in the blood. For this purpose Frerichs strongly recommends benzoic acid in five or ten grain doses, with iced drinks which have been acidulated with tartaric acid, lemon-juice, &c. To obviate congestion of the head, costiveness should be prevented by assafœtida and vinegar injections, by jalap, calomel, or croton oil; while ice may be also used locally, or the cold douche can be cautiously tried if any cerebral symptoms actually show themselves. In the cases which have come under my own observation great benefit has been derived from the early employment of tonics, and particularly from the cautious use of steel with the mineral acids. When convulsions have occurred, or when a paroxysm seems impending—during either pregnancy, labor, or childbed—chloroform proves invaluable; since its inhalation weakens the fit, and diminishes the reflex excitability of the nervous system. Moreover, Sir James Simpson has very ingeniously suggested that the beneficial effects of this anæsthetic are due to its producing—as it is well known to do—a temporary diabetes mellitus; for it has been demonstrated that sugar in small quantities added to the

urine out of the body prevents for a time the ordinary decomposition of urea into carbonate of ammonia.

Dr. Braun states, that in sixteen cases of eclampsia, occurring in succession, which he treated with chloroform and acids, complete recovery always took place. This happy result is certainly much more favorable than has hitherto been obtained by any other course of remedies. With regard to my own experience it may be mentioned, that since I became acquainted with the views here advocated I have been called upon to treat several examples of puerperal convulsions in conjunction with other physicians. In one of these cases the patient was skilfully and successfully treated by another practitioner, who simply hurried the labor and delivered. In another instance pregnancy was only advanced to the eighth month, and a cure was effected by keeping the woman under the influence of chloroform for an hour at a time, on three separate occasions, at intervals of twelve hours; together with the liberal administration of lemon-juice. After the last inhalation the convulsions permanently ceased; and delivery took place at the proper time of a live child. With regard to a third case, labor had well set in, and the os uteri was almost fully dilated when the convulsions commenced. The forceps were, therefore, readily applied, and a living child was brought into the world; the mother making a good recovery. I do not of course wish it to be understood that none of my cases have died; but simply, that as far as my experience goes, a fatal termination in uræmic eclampsia is a very exceptional event.

The last, but certainly not the least important remedy, is the prompt removal of the contents of the uterus. This has to be accomplished either by the use of the forceps, or by turning, when the convulsions occur during delivery at the full term; or by the induction of premature labor, if the dangerous symptoms of uræmia take place in the latter months of pregnancy. Supposing that there are indications of the death of the fœtus, there can be no doubt that the sooner the infant is expelled the better. After emptying the uterus, it will be advantageous to continue the administration of the benzoic acid, so as to prevent any return of the paroxysms; while ice and acid drinks should be freely allowed. If, after the return of consciousness, there be any distressing bodily restlessness or mental irritability, sponging the body with vinegar and water can be employed with advantage.

In all instances Dr. Braun asserts that general depletion does mischief; because by bleeding the anæmia is increased, the nervous fits are not improved, the spasms are often aggravated, and puerperal thrombosis and pyæmia in childbed, are much to be feared. My own observations of this disease at the present day quite confirm this opinion; and I have no hesitation in expressing a decided belief that bloodletting, as a general rule, without exerting any valuable effect on the symptoms, is often calculated to produce irreparable mischief. With regard to the application of blisters to the back of the neck, sinapisms to the legs, hot pediluvia, and such like, it is only necessary to say that they cannot possibly do any good. When a comatose condition supervenes, the patient is to be kept perfectly quiet; while abundant diaphoresis had better be encouraged by the wet sheet, hot bottles, blankets, &c. No medicine need be given. It must be remembered that the coma is not due to simple congestion of the brain with blood, but chiefly to the effect of poisoned blood on the nervous substance. At the same time it will often happen that there is slight serous infiltration.

Section 2.—Diseases of the Generative Organs.

1. Pruritus of the Vulva.—Few affections are more annoying in the early periods of pregnancy than an excessive itching of the external genital organs. The insupportable irritation, the continual scratching which is resorted to for the sake of temporary relief, and the consequent excoriations which are produced, all give rise to so much local and constitutional distress, that sensitive women are sometimes rendered thoroughly ill and miserable. In a few rare cases, the attack has degenerated into nymphomania; the impure desires being at first excited by the friction resorted to for the alleviation of the itching.

The causes of pudendal pruritus are numerous. Thus it may be merely a sympathetic disorder, unattended with any cognizable alteration of tissue. There may be only a state of hyperæsthesia of the nerve filaments. Sometimes, the irritation is simply a symptom of inflammation of the follicles of the mucous membrane of the vulva. Dewees states in his work on midwifery that he examined a lady who was attacked early in pregnancy with an intolerable itching in the pudendum and along the

vagina, and on separating the labia he found all the parts covered with an incrustation of aphthæ; which disease was thoroughly cured in twenty-four hours by the repeated application of a strong solution of borax. So moreover, pruritus not uncommonly results from the irritation produced by acrid vaginal discharges; and especially by that variety of leucorrhœa which is due to excoriation of the labia uteri. Or again, the presence of ascarides in the rectum may give rise to pruritus. And lastly, in dirty women, it may be owing to the presence of the pediculus pubis, or crab louse; a parasitic insect which occasionally infests the hair of the pubes.

The characteristic feature in all cases is the almost constant and intense itching. If the patient have suffered for any length of time, and if recourse has been had to frequent scratching, troublesome ulcerations about the labia are very likely to be found. There is generally great restlessness at night, loss of appetite, constipation, indigestion, mental irritability or depression, and an indisposition for any kind of exertion. The itchings are not always confined to the genital parts. I have seen patients who have suffered just as acutely from the irritation about the upper and inner part of the thighs as from that about the perineum. In one instance the itching extended all round the sphincter ani, but only on the right side of the vulva. Dr. Maslieurat-Lagémard has related the remarkable case of a lady, who, in eight successive pregnancies, was afflicted with itchings so violent as to produce premature labor. On four of these occasions the irritation began in the sixth month, twice at eight months and a half, and twice in the seventh month. It spread over the entire cutaneous surface; the whole trunk, neck, face, scalp, thighs, legs, and genitals being all affected. So severe was the suffering, that the violent rubbings which were resorted to produced extensive excoriations; though except for these abrasions, the skin appeared perfectly healthy. Simple and alkaline baths; ammoniacal and camphorated frictions to the spine; preparations of opium, bismuth, valerian, hyoscyamus, and belladonna; and lastly, general bleeding, were all employed without any advantage. But almost immediately after the uterus had expelled its contents, the symptoms vanished.[1]

[1] Gazette Médicale de Paris. Tome Troisième, p. 204. 1848.

The treatment of these cases must vary according to the cause of the affection. When it is merely symptomatic of pregnancy we shall often fail to do more than give partial relief. In such, at the onset, the bowels should be regulated by some simple aperient, as rhubarb and magnesia, or sulphate of soda and taraxacum; and then a combination of zinc and nux vomica like the following, may exert a favorable influence on the nerves:

Take of,—Valerianate of Zinc, 30 grains; Extract of Nux Vomica, 5 grains; Extract of Hyoscyamus, 60 grains. Mix into a mass, divide into twenty-four pills, and silver them. Label—"One pill to be taken three times a day,—at 10 A.M., 4 P.M., and bedtime."

With regard to the application of sedative lotions it need only be said, that I have often found one or other of the succeeding forms prove temporarily useful:

Take of,—Bird's-eye Tobacco, 120 grains; Boiling Water, 1 pint. Infuse for an hour and strain. To be freely used as a lotion, when cold.

Take of,—Ointment of Aconitia, 50 grains; Liniment of Lime, 2 fluid ounces. Mix. To be applied freely, several times a day, with a large camel's hair pencil.

Take of,—Solution of Hydrochlorate of Morphia, 1 fluid ounce; Diluted Hydrocyanic Acid, 80 minims; Elder-Flower Water, to 8 fluid ounces. Mix, for a lotion.

Take of,—Glycerine of Borax, 2 fluid ounces; Rose Water, to 8 fluid ounces. Mix.

Take of,—Solution of Potash, 2 fluid drachms; Diluted Hydrocyanic Acid, 90 minims; Almond Mixture, to 8 fluid ounces. Mix.

Take of,—Solution of Subacetate of Lead, 4 fluid drachms; Tincture of Digitalis, 6 fluid drachms; Elder-Flower Water, to 8 fluid ounces. Mix.

Ointments are generally more objectionable than lotions, inasmuch as they are dirty applications, and are usually injuriously affected by heat. But sometimes it may appear useful to employ a soothing cerate; and then the officinal belladonna ointment, or the ointment of spermaceti, or that of the subchloride of mercury, or of the acetate of lead, or the compound ointment of subacetate of lead can be tried.

Patients have also stated that they have been relieved by the use of the ointment of nitrate of mercury, when properly diluted: by the subnitrate of bismuth mixed up with spermaceti: by Fuller's earth: by astringent lotions containing nitrate of silver, nitric acid, alum, sulphate of zinc, or sulphate of copper: by washing the parts with lime-water, or ice-cold water, or with a

lotion formed of equal parts of the solution of perchloride of mercury and almond mixture, or with vinegar and water: and by the employment of tepid hip-baths, made alkaline through the addition of carbonate of potash. In some cases, where the incessant and intolerable itching has appeared to be entirely due to congestion and granular abrasion of the lips of the uterus, I have effected cures by the use of leeches to the diseased surface; or by the careful application to the abrasion of the acid solution of nitrate of mercury. With regard to the internal administration of drugs, I can only say that their use has almost invariably disappointed me. One or other of the different preparations of zinc will probably be serviceable where there is disordered nerve-influence. Quinine has occasionally seemed to be of temporary service. Knowing the great value of arsenic in many cutaneous affections, I at one time anticipated a good result from its employment in pruritus; but my hopes have been very imperfectly realized. Such also has been the case with alteratives; although small doses of the perchloride of mercury, continued for a long time, are sometimes indicated. The mineral acids, sarsaparilla, alkalies, strong purgatives, and narcotics, have all failed to do any marked good in my hands. It only remains to notice that if ascarides be present in the rectum they must be removed by enemata consisting of salt and water, or of a strong infusion of quassia; while if any pediculi are found they are quickly to be destroyed by freely dusting all the parts with calomel, and their return prevented by repeating the application as well as by frequent ablutions with soap and water.

2. Œdema of the Labia.—During the last two or three months of gestation the external labia sometimes become œdematous, while occasionally they get enormously distended with serum. This condition must be carefully distinguished from that general dropsical effusion so often found coexisting with albuminuria.

A simple œdematous state of the labia is supposed to be due to the pelvis being sufficiently large to allow of the gravid uterus sinking more or less deeply into its cavity; the pressure thus exerted upon the veins inpeding the return of blood. It is to be relieved by the recumbent posture being kept, with the head and shoulders as much on a level with the trunk as may be bearable; and this failing, by the exhibition of purgatives, by bathing the

parts with warm water, and—if necessary—by making a few punctures with a sharp needle.

3. Vaginal Leucorrhœa.—There are very few diseases of the uterus or vagina which are not accompanied by a leucorrhœal discharge, more or less profuse. As a general rule, I believe the most common cause of severe leucorrhœa to be disease of the mucous membrane of the os and cervix uteri. But in the remarks now about to be made I wish to confine my observations to that variety of vaginal leucorrhœa which often affects pregnant women, particularly during the three or four latter months of gestation; and which resembles that form of discharge which so commonly occurs after each menstrual period, in which the increased secretion of mucus is attended with a partial desquamation of the epithelial surface of the vagina. The fact must be remembered that the mucous membrane of this canal is covered with a layer of pavement epithelium, beneath which are countless villi and numerous mucous glands. These are the structures most concerned in producing the discharge under consideration; and it is astonishing to see the quantity of muco-purulent fluid which the villi or papillæ will secrete when they are denuded of epithelium. The cause of this desquamation appears to be some constitutional change or peculiarity acting in conjunction with the pregnant uterus to produce irritation or relaxation of the vaginal tissues.

This affection usually gives rise to much annoyance. When the discharge is copious it weakens the system, and seems particularly to interfere with the due performance of the functions of the digestive organs. It may sometimes perhaps appear that dyspepsia is the cause and not the result of the disorder; but often, as mentioned, the contrary will be found to be the case. This is proved by the fact, that on relieving the vaginal affection by local remedies the stomach regains its tone. Moreover, the discharge is liable to set up great irritation, a burning heat, with tingling and itching about the external genitals; while, unless great cleanliness is practised, the secretion forms slight crusts with the matted hairs, excoriations are produced, and then even walking becomes a painful act.

The treatment which has been found most useful and grateful consists in the employment of a tepid hip-bath every morning, or even night and morning; complete abstinence from sexual

intercourse; plenty of rest in bed, on a mattress, with only moderate coverings; a regulated but nutritious diet, without any stimulants; and the proper employment of simple injections. The injection which I most frequently order is made by adding from four to six fluid drachms of the solution of subacetate of lead to twenty ounces of water; the whole of this being directed to be gently used twice a day by means of the vulcanized India-rubber syphon syringe. At the same time mild laxatives containing taraxacum, or rhubarb and magnesia, may be prescribed. Where there is any evidence of the presence of a syphilitic taint in the system, the solution of perchloride of mercury is to be continuously administered for several weeks—indeed until a complete cure is effected. In other cases, a course of tonics will often do good, especially if there exist any constitutional debility. Small doses of the nitro-hydrochloric acid with compound tincture of bark often prove very beneficial; or if there be no contra-indicating conditions, such a combination of iron and alum as the following will be found useful:

Take of,—Ammoniated Iron Alum, from 30 to 60 grains; Distilled Water, 8 fluid ounces. Mix and label,—"One-sixth part twice a day, about 11 A.M., and 8 P.M."

The Sand-rock chalybeate water, in the Isle of Wight, which has long been noted for its efficacy in curing many chronic forms of uterine disease, owes its valuable properties to the large proportion of sulphate of iron and sulphate of alumina with which it is impregnated. But in this case the two salts are simply dissolved in the water; there being no chemical combination. Such a mixture is much less efficacious than the true iron alum; which, indeed, contains no alumina at all, but consists merely of a double sulphate of ammonia and iron. There is, it may be noticed, another preparation consisting of a double sulphate of potash and iron; but as this is less soluble than the iron alum with ammonia, it is better to employ the latter.

4. Discharge of Watery Fluid from the Uterus.—Every now and then it happens that pregnant women suffer for several weeks before labor from a profuse colorless and limpid watery discharge; the fluid which comes away resembling in all respects the healthy liquor amnii. The terms *hydrorrhœa* and *metrorrhœa*

have been used to designate this affection: but as the former merely signifies an escape of water, so it seems better to employ the latter, which at all events indicates that the discharge is of uterine origin. The quantity of water expelled varies from some two or three ounces to one or two pints daily. The flow may continue for a few days and then cease; or it may recur at intervals, as most frequently happens, until the end of pregnancy. Moreover, the fluid comes from the patient either in gushes or it dribbles away, perhaps ceasing when the recumbent posture is assumed; and it is frequently attended with weakness, and troublesome lumbar pains. There is only a very slight, if any, diminution in the size of the abdomen produced by it. And as far as my experience goes, it does not appear to have any injurious effect upon fœtal life; inasmuch as the child is usually born alive and healthy at or near the full time.

The question of the source of this discharge has given rise to a variety of opinions. Many authorities are in favor of its being due to the evacuation of fluid that has collected in the space which it is said sometimes exists between the amnion and chorion, or between the chorion and the decidua. For although these membranes are properly in close apposition towards the end of gestation, yet it is argued that occasionally—as in the earlier months—they are separated by a kind of gelatinous fluid. Independently of the fact, however, that the separation, when present, is much too slight to allow of the collection of such an amount of fluid as is sometimes expelled, there are many other objections to this view. Dr. David Davis observes that this is "in most cases, a dangerous and often a fatal affection of the pregnant state;" but I cannot find any author of note who corroborates this statement. The same gentleman seems also to believe that this *dribbling of the waters* can possibly be due to what may be called a dropsy of the chorion; the chorion taking upon itself to secrete fluid just as the amnion does.[1]

Dr. Harvey, of Dublin, in considering these cases, reasons by the method of exclusion, and shows the great improbability or even impossibility of the fluid coming from the cervical glands of the uterus, or from the vagina, or from the space between the decidua and the chorion, or from the interval between the

[1] The Principles and Practice of Obstetric Medicine. Vol. ii, p. 903. London, 1836.

chorion and the amnion. Hence he thinks the conclusion is almost inevitable, that the amnion must be the source of this flood; solutions of continuity probably occurring in this membrane from time to time, so as to allow of these discharges. The openings then either heal up or close again; or else the mechanical relations of the bag to the surrounding parts admit of the amnion refilling to a certain extent by a fresh secretion of its peculiar fluid. In confirmation of his views he refers to examples recorded by Denman, Burns, and others, where the amnion is said to have given way from fright; and in which the waters were discharged without labor coming on. He then relates the following interesting instance where the flow was undoubtedly amniotic:

Mrs. ——, mother of several children, was, for more than a year, the subject of heavy sanguineous discharges, which were so little influenced by the treatment adopted that the existence of polypus was thought possible. An examination revealed considerable congestion of the os and cervix uteri, with superficial ulceration, which gave way to treatment generally and locally applied. During last summer her health was considerably improved; but occasionally menorrhagic attacks, which latterly observed more or less closely the monthly periods, showed themselves. Matters were going on thus when she suffered a considerable shock by her eldest boy meeting with a severe accident, in which his arm was fractured. On that day, for the first time (six weeks before delivery), she had a sudden gush of clear watery fluid from the vagina, and since that time to the date of these notes (5th November), she was scarcely free from it: it would diminish or nearly stop for a few days at a time, to come on again in gushes, and in considerable quantity. The quantity escaping in one of these was seldom less, and generally more, than half a pint; and on the late occasion, when the flow was accompanied by a heavy sanguineous discharge also, she thinks the combined amount was fully a quart. It came on in the horizontal position as well as in the erect, and apparently without any cause. The size of the abdomen did not appear much affected by these at any time. The occurrence of the watery discharge suggesting the probability of pregnancy, notwithstanding the menstrual changes which had been going on with some regularity, and that, if pregnancy did exist, the ovum might have suffered hydatid degeneration, I proposed an examination for the purpose of ascertaining the point. I found an abdominal tumor occupying the hypogastrium to above the umbilicus, and on laying my hands over its surface, it gave a good example of the value of a diagnostic indication lately suggested by Dr. Oldham; it afforded distinct evidence of its being uterine by gradually and regularly hardening under my hand. The movements of the child were also felt; and fœtal pulsation distinctly heard by the stethoscope, put an end to all doubts. I told the lady that she had passed some six or near seven months of her pregnancy without being aware of it, and that her labor would probably come on prematurely; all of which she entirely disbelieved, and I could not induce her to make the necessary preparations. Two days after, I was called to her—the first stage of labor having set in with unusual distress and irritation; the pains peculiarly sharp

and unbearable; the os uteri was hard and unyielding, and the breech, presenting in the second position, was felt in close contact. I immediately put her on antimonial solution, notwithstanding which the os uteri took over three hours to relax. After a first stage of about four and a half hours, and a second of less than half an hour, a male child, of scarcely seven months' growth was born. The presenting hip and buttock were perfectly black, evidently from the direct pressure to which they had been subjected in consequence of the loss of the liquor amnii. None whatever escaped with the child, and the sanguineous discharge was also unusually scanty. I do not think I ever witnessed so dry a labor.[1]

From a careful consideration of the foregoing facts, as well as of several other recorded cases, I cannot avoid coming to the conclusion that they all tend to support the view of the escaping fluid being the liquor amnii. There are three circumstances which, as it seems to me, especially favor this theory. They are these: *First*, an opening has been found in the membranes through which the fluid has escaped. Thus, Mr. Ingleby relates the case of a lady, six months gone in her third pregnancy, who suddenly lost a large quantity of water during the night. From this moment until the occurrence of labor, there escaped every two or three days a pint and a quarter of fluid. The patient was at length delivered of a large boy. The after-birth was expelled spontaneously; "my hand"—says the narrator—"receiving the mass when at the outlet, lest its weight should tear the membranes. I then carefully examined the whole. and in addition to the aperture in the centre of the membranes, made by the passage of the head, there was a circular one very distinct just at the edge of the placenta. From this aperture doubtless the fluid had from time to time escaped; the patient prior to each evacuation being sensible, by a kind of passive contraction of the uterus, that it was about to come away."[2] *Secondly*, the discharge often ceases directly the patient lies down, as it would naturally do, were the opening situated in the upper and front part of the amniotic sac. And *thirdly*, it is well known that even the whole of the liquor amnii may escape many days before labor without compromising the life of the fœtus. Mauriceau refers to some few instances where even two or three weeks seem to have elapsed between the rupture of the mem-

[1] The Dublin Quarterly Journal of Medical Science. Vol. xxv, p. 233. February, 1858.

[2] A Practical Treatise on Uterine Hemorrhage, in connection with Pregnancy and Parturition. Note, p. 29. London, 1832.

branes and the setting in of labor pains. In the year 1860, I attended a lady in her first labor where the whole of the liquor amnii was discharged sixty hours before the birth of a vigorous healthy child.

On the other hand, the opponents of the foregoing views are numerous. The arguments in an elaborate essay on this subject, by M. Chassinat, are founded upon forty-two cases which he has collected from various authors, and ten examples not hitherto published. Although this author's reasonings appear to me unwarranted from the premises, yet they are decidedly ingenious and deserving of attentive consideration. The conclusions at which he arrives are as follows:

(1) The metrorrhœa of pregnant women, appearing at variable periods in the course of pregnancy, is an affection of the reality of which no doubt can be entertained. (2) In the great majority of cases, if not in all, the liquid is secreted between the internal surface of the uterus and the envelopes of the fœtus after detachment of the membranes. The differential characters suffice to distinguish it from the waters of the amnios, discharged by reason of the premature rupture of the membranes. (3) The causes which seem to favor this abnormal secretion are a general polyæmia, or local irritation of the uterus, supervening in several cases upon external violence. (4) The pathognomonic symptom is the issue of a fluid from the vulva, which is usually limpid, and thin and albuminous; and which may or may not be accompanied by painful uterine contractions. (5) There is no anatomical lesion known which is peculiar to the disease. (6) In the great number of the cases, the metrorrhœa is dangerous to neither mother nor child, pregnancy going on to its normal term, the liquor amnii being as abundant as usual, and delivery proving neither longer nor more laborious. (7) As a general rule no treatment is required. If general plethora prevails, bleeding may be resorted to. With rare exceptions, the pregnancy should be left to itself, and the labor allowed to terminate by the sole efforts of nature.[1]

Notwithstanding that various authors differ as to the origin of this affection, yet all agree as to the treatment which it demands. This is exceedingly simple. It consists mainly in the avoidance of all moral and physical excitement, and in the adoption of perfect rest in the recumbent posture until after the discharge has quite ceased for several days. If there are any symptoms which seem to indicate a prospect of uterine contractions setting in prematurely, a dose of the extract of belladonna had better be administered.

5. Dropsy of the Amnion.—Having already alluded to the

[1] Gazette Médicale de Paris. Nos. 29, 30, 39, 41, 43, 47, and 49. Paris, 1858.

occurrence of this singular affection, and having made some observations on its cause and diagnosis (p. 170), it is now only necessary to offer a few remarks on the symptoms which it gives rise to, and the treatment which they demand.

The symptoms are chiefly such as may be produced by any circumstance which gives rise to great distension of the abdomen. The patient suffers so much inconvenience from moving about that she is often compelled to keep in bed; and being unable to lie down, is obliged to be propped up with pillows. She has alarming attacks of palpitation and dyspnœa; while fits of fainting frequently occur. There is great mental depression and prostration of the vital powers. The stomach is very irritable, so that the sufferings are greatly aggravated by repeated attacks of vomiting. Moreover, there is a scanty secretion of urine, though the calls to micturition may be very numerous and urgent. The uterus soon acquires a remarkable volume, being often more distended at the fifth or sixth month than it is at the full term in normal gestations; while fluctuation, with a distinct appearance of undulation, can often be detected by palpation. Of course, the increased size of the womb will depend upon the quantity of liquor amnii secreted. But when it is recollected that from twelve to sixteen ounces is the normal amount, it can easily be understood that even four or six or eight pints will be sufficient to produce very considerable inconvenience. How great then must have been the suffering in those cases where, as authors relate, thirty, forty, and even fifty pints have existed in the amniotic cavity.

Several instances have been reported showing that, even prior to the sixth month of gestation, the distension has not been so very remarkable, and yet there has been almost complete asphyxia; this condition being indicated by nearly total cessation of the respiration, inability to feel the pulse, and lividity of the features. It is strange to find such urgent symptoms produced in these cases of dropsy, when perhaps the womb is not larger than it is at the ninth month. But there are I believe three circumstances which explain this anomaly. *First*, the blood is not in a healthy condition; as is indicated by the œdema which exists, and by the albuminuria which will often be found to be present. And it is certain, that the greater the amount of albumen present in the urine, the smaller will be the proportion in the blood.

Secondly, I have found that the amount of albumen in the liquor amnii itself is considerably greater than it ought to be. This fluid, in its healthy condition has the properties of a very weak solution of albumen; the proportion of the latter being greatest during the earlier months of conception. Thus, about the fourth month it forms rather more than 10 per cent. of the liquid; at the fifth month, a little more than 7 per cent.; at the seventh month, less than 6 per cent.; while at the full term there is scarcely 1 per cent. And, *thirdly*, owing to the sudden and rapid development of the uterus, the abdominal walls have not had time to gradually relax and yield; so that instead of the uterus being able to project in front, it is forced backwards and upwards against the diaphragm.

In one case, the distension of the uterus became so great and the diaphragm got pushed up so high, that the respiration was very greatly interfered with. The abdomen seemed of a remarkable size; but the chief distress was from the dyspnœa, which at times became so urgent that although gestation had only advanced to the seventh month the woman's life appeared to be very seriously endangered. Some diversity of opinion existed amongst the physicians in attendance as to the best means of inducing labor: the difficulty being at length solved by a determination not to interfere until the os uteri evinced a tendency to dilatation. It soon appeared clear, however, that unless relief was afforded the patient would die of suffocation; and therefore the practitioner who had the responsibility of the case very properly ruptured the membranes. By keeping his finger in the os uteri he so regulated the discharge of the liquor amnii that only a portion came away at a time; but at the end of two hours fourteen pounds had been collected in basins, and an uncertain quantity lost in the bed. All the distressing symptoms—including the dyspnœa, vomiting, and cough—immediately disappeared, while the œdema of the extremities began to diminish; but as the uterus appeared incapable of contracting, the cervix was dilated and a living infant brought away by the forceps. The child was puny and feeble, and its limbs were very small. In six weeks the patient got quite restored to health; and in two years she again became pregnant, and went through the process of parturition in a natural and satisfactory manner.

The consequences of this state to the fœtus are usually very

disastrous. Either it perishes, and the pregnancy spontaneously terminates prematurely; or the infant when born at the proper time is small and feeble, so that not unfrequently it only survives its birth a few hours. A remarkable circumstance in these cases, pointed out by MM. Bunsen and Kill, is that the fœtus is often dropsical; sometimes being affected with ascites, and sometimes with hydrocephalus. The latter gentleman has also remarked that the placenta is often remarkably large, in one case especially, which ended at the sixth month, this organ being one-third larger and double the thickness of an ordinary placenta at the end of the ninth month. As regards the mother, the labor is very likely to be tedious; while the act of delivery is apt to be followed by serious flooding, owing to the uterus having partially lost its tone and contractile powers.

In the treatment of this malady medicines will be found to have no beneficial effect. Many attempts have been made to impede the progress of the dropsy by diuretics and drastic purgatives; but such remedies have proved worse than useless. All that the practitioner can do, is to support the maternal strength by nourishing food and tonics; to keep the mind and body tranquil; and if the distress be great, to induce premature labor by rupturing the membranes. Care must be taken to prevent exhaustion during a tedious labor; and the occurrence of hemorrhage ought to be guarded against by the administration of one or more full doses of ergot, as well as by the proper employment of pressure, directly after the birth of the child.

6. Rheumatism of the Uterus.—This affection either occurs alone, or it may exist in combination with a general attack of acute or chronic rheumatism. It is not common. Being more frequently met with towards the end of gestation than at any other period of pregnancy, it is doubtless often the cause of uneasiness which is mistaken for false labor pains. More frequently of the subacute than of the actually acute form, it arises from all those circumstances which are favorable to the development of rheumatic affections generally, especially in such women as are constitutionally predisposed.

The symptoms consist chiefly of pain in a portion or the whole of the uterus. The suffering is increased by pressure, and is rendered very distressing by the movements of the fœtus; while it

varies in severity from a simple feeling of heaviness to an annoying dragging sensation. There is a frequent desire to empty the bladder, the passage of the water sometimes causing severe smarting sensations; and the urine is commonly loaded with urates. The rectum sympathizes with the uterus, giving rise to tenesmus. There is usually also a certain amount of constitutional disturbance; such as fever, thirst, agitation, restlessness, and—particularly towards the end of the attack—profuse acid perspiration. When the rheumatic pains are very severe, uterine contractions are likely to ensue and to be followed by premature delivery. But this happens more rarely than might be expected, owing probably to this circumstance,—that whereas in natural labor the contractions commence at the fundus and terminate at the lower segment of the uterus, in rheumatism they commence at the painful point and are only irregularly propagated towards the cervix. Lastly, an attack of rheumatism at the period of parturition generally retards the progress of the labor; it renders the uterine contraction very painful from the commencement; and it is sometimes the cause of flooding after the expulsion of the child and placenta, owing to its influence in preventing perfect uterine contraction.

The treatment of this affection is not difficult; opium, bicarbonate of potash, an abundance of refrigerant or saline drinks, and perfect rest generally sufficing to effect a cure. A fomentation flannel, or a belladonna plaster, applied over the abdomen, will sometimes be found useful. A blister to the sacrum gives considerable ease. The diet should be nourishing, but free from stimulants; and the bowels ought to be kept regular by mild antacid laxatives, to which it may sometimes be useful to add a little colchicum.

I have heard it suggested, that in a severe case the injection of carbonic acid gas into the vagina might afford relief, and could not possibly do any harm. I should not recommend its use, however; for at the best it would only soothe for a short time, while it might certainly do permanent mischief. The following case, related by Professor Scanzoni, shows that the injection of this agent into the uterus may be fatal; and although there would, of course, be much less risk in only applying it to the vagina, yet an accident might happen. The chief points in the history are these:

A young pregnant woman was about to undergo amputation of what was thought a hypertrophied cervix uteri; which protruded out of the vulva in the form of a bluish, chinky tumor, of the size of a small apple. The attending physician—the father of the patient—not thinking she was pregnant, insisted upon having carbonic acid injected into the cavity of the uterus, preparatory to the operation, with the view to prevent too profuse a hemorrhage (!). This injection was made by means of a suitable apparatus; but hardly had some cubic inches of gas penetrated into the cervix, when the patient screamed, and said that she felt the air rushing into her abdomen, neck, and head. General tetanic convulsions supervened; then a long agony, followed by death at the end of nearly two hours. At the autopsy no other lesion was found to which death was attributable, but a very considerable œdema of the lungs. The uterus contained an uninjured ovum of about four months. The question arises, was the death due to the poisonous qualities of the carbonic acid? or could the gas have penetrated into the orifice of an open vein, and have acted like air introduced into the veins?[1]

In some severe examples of rheumatism of the uterus it has been deemed expedient to bring on premature labor; but the necessity for such an extreme proceeding can very rarely arise.

7. Inflammation of the Uterus.—Acute inflammation of the unimpregnated womb is admitted by all observers to be a very rare affection, and one which seldom endangers life even when it does occur. But I believe metritis during pregnancy to be a still more uncommon ailment; so that had I not met with one undoubted instance which ended in suppuration, I should perhaps have been inclined to agree with those obstetricians who altogether deny its occurrence. It is, without doubt, quite certain that an extensive practice may be carried on for several years without an example of inflammation of the pregnant uterus being met with; but I regard it as an equally established fact that the disease does occasionally manifest itself.

The seat of the inflammation, speaking generally, is the muscular tissue; the peritoneum and the lining membrane being seldom involved. The more advanced the pregnancy, the more limited will be the morbid action; the entire organ with all its tissues being only very rarely affected, and then only in the first two or three months. The disease frequently assumes an erysipelatous type; and perhaps arises from some deterioration of the blood, from cold and damp, from mechanical injuries, or it may spread from neighboring organs—as in instances of cystitis, ovaritis, dysentery, &c. The starting-point of the affection, in an

[1] Beitrage zur Geburtskunde und Gynaekologie. Band iii, p. 181. Würzburg, 1858.

unhealthy subject, may be an exaggerated degree of congestion of the uterus. This latter condition can doubtless result from general plethora; but usually it is probably otherwise, since it is most commonly witnessed in nervous women suffering from anæmia or perhaps even from albuminuria. Such a circumstance will not appear surprising, when it is remembered that these females are precisely those who are most often afflicted with hemorrhoidal discharges, or who have abundant catamenial flows when not pregnant. The chief symptoms of uterine congestion are a feeling of tightness in the abdomen and of weight in the pelvis; together with pains in the loins and groins. The upper part of the thighs may be also the seat of a dull sense of uneasiness, which is augmented by standing and by efforts at defecation. Moreover, micturition is frequent; and slight uterine contractions are often felt. If pregnancy is too little advanced for the woman to have perceived the fœtal movements, the appearance of these will be retarded; or if they have been manifested, they diminish in frequency and even cease entirely. At length, perhaps, a slight flow of blood takes place from the vulva. The consequences of this congestion may be very grave; since, in addition to the chance of its terminating in metritis, it has likewise an influence in developing hemorrhage and premature contractions. The results to the product of conception are also dangerous; inasmuch as it may not only be the cause of engorgement or apoplexy of the placenta, but, according to some observers, may give rise to deformity by producing compression and contraction of the fœtal limbs.

The constitutional symptoms of metritis are much the same as those produced by inflammation of other important viscera; chiefly consisting of a feeling of general discomfort, heat of skin, quickness of pulse, restlessness, loss of appetite, great thirst, nausea and vomiting, &c. When only a limited portion of the uterine walls is affected, the prominent local symptom will be excessive sensibility of this part; the tenderness being exasperated by pressure, as well as by the active movements of the fœtus. If the disease attack the lower segment of the uterus, the bladder will be sympathetically affected; and the patient will be tormented with a frequent desire to micturate. Moreover, complaint is usually made of a sense of weight and bearing-down, of great pain in the back and thighs, and of a feeling of heat and

throbbing above the pubes. In the case which came under my own observation there were attacks of pain coming on in paroxysms, and lasting for half an hour, the intervals having a duration of eight and twelve hours. The paroxysmal exacerbations were exceedingly severe, and indeed were only at first relieved by chloroform, which was eagerly inhaled. Full doses of opium and ether afterwards mitigated the suffering, and probably obviated the risk—which appeared considerable—of miscarriage. On examining per vaginam there was found increased heat, great tenderness of the cervix, and enlargement of the vessels, which could be felt rapidly and strongly pulsating.

The consequences of metritis setting in during gestation may be very serious. Where the disease is limited, or when it is early and completely cured, both mother and fœtus may escape unharmed. The termination of the inflammation in resolution, cannot, however, always be obtained; and perhaps the next best result to be expected is the effusion of lymph. Yet it must be remembered that if the inflamed part coincide with the seat of implantation of the placenta, the effect of the pouring out of coagulable lymph may be to cause unnatural adhesion of this organ to the uterine walls; in which case the adherent placenta will in all probability require manual interference to effect its separation after the birth of the infant. A third mode of termination is in suppuration, and the formation of an abscess in the uterine tissue. This abscess may open into the interior of the uterus, or into the cavity of the peritoneum, or into the bladder or rectum. In the case to which allusion has already been made, the cervix was the part chiefly involved and the abscess pointed in the vagina, so that on making a small puncture its contents were safely evacuated. A fourth and important result is a softening of the inflamed tissue. The uterine parietes during pregnancy are naturally very much less dense and resisting than in the non-gravid state; and consequently when the softening proceeds to an abnormal extent, the consequences may often prove serious. At a meeting of the Pathological Society of Dublin, 26th January 1839, Dr. E. Kennedy exhibited a specimen of "softening of the uterus," taken from the body of a woman who died on the day of her admission into the Lying-in Hospital. The only symptom of any note which she had complained of was pain at the upper and inner part of the thigh, where a slight redness

was observable. On dividing the parietes of the abdomen, the uterus was seen of a deep purple or almost black color, while its texture was remarkably soft, and its mucous surface covered with grumous blood.—The occurrence of rupture of the uterus during pregnancy is I believe only to be accounted for on the supposition that the tissues have been previously softened by the inflammatory process. It seems otherwise incredible that an attack of vomiting, or a fit of passion, should suffice to rupture the walls of the womb; though these circumstances would be quite sufficient when the parts had previously been weakened by disease.

It is hardly suprising that metritis should not unfrequently produce miscarriage or premature labor. If the inflammatory action continue after the expulsion of the ovum, that process of involution by which the uterus is restored to the size and condition it presented prior to conception will be retarded. The deficient involution which thus results is often the foundation, as it were, for future chronic disease of the uterine substance; which disease may annoy the patient for years, materially injure her health, and prevent her from again conceiving.

The treatment of these cases is exceedingly simple. At the very commencement complete rest in bed and a simple diet must be insisted upon. If there be much fever, the solution of citrate of ammonia in half-ounce doses may be given every four or six hours; together with plently of diluents in the shape of iced water, barely water, tea, or lemonade. When the local suffering is great, relief may very quickly be afforded by the application, through the speculum, of three or four leeches to the lips of the uterus; a proceeding which will be found more efficacious and much less dangerous than the use of a dozen leeches to the hypogastrium or groins. Remembering, too, that the morbid action is frequently of an erysipelatous character, it will be a wise course not to lower the patient's strength; and on this ground alone, not to mention other reasons, general bleeding ought to be forbidden. Anodyne fomentations or hot poultices can be laid over the abdomen without any fear of their inducing uterine contractions; or sixty grains of the extract of belladonna may be spread over the parietes, and the latter covered with a linseed poultice. Supposing the suffering to be very severe, and to be the source of much restlessness, opiates in full doses will be demanded; while if the pain recurs in paroxysms and is ex-

cessive, the exhibition of chloroform may be found necessary, or opiate enemata can be resorted to. If we suspect the formation of an abscess, or the occurrence of gangrene—which has been said to happen—steps must be taken to support the woman's strength by administering ammonia and bark, or quinine; together with nourishing food and wine or porter. Should the inflammation appear to have any connection with a syphilitic taint, no remedy will be found more useful than the perchloride of mercury; it being best to give the pharmacopœial solution of this metal, in drachm doses, every six or eight hours. And then, lastly, the practitioner must be advised to watch his patient very carefully, and to do so until she seems quite restored to health. It will also be prudent for him to calculate the dates at which she would be menstruating, were it not for her being pregnant, so that she may then be particularly cautious as to her exercise, diet, use of purgatives, &c.; since it is highly probable that the uterus becomes somewhat congested at these times, and very often only a slight spark is needed to rekindle the inflammatory action which may have just subsided.

8. Uterine Hemorrhage.—Of the many topics which come within the range of obstetric medicine, few demand greater attention than the one now to be treated of. For not only is a discharge of blood from the pregnant uterus a prominent symptom of several different lesions, but the consequences which may result from it are often of vital importance both to the mother and her offspring. Now the subject being so serious and extensive, it is only natural that much doubt should be felt as to the best method of dealing with it, in order succinctly to impart all the information that is possible regarding this matter. The simplest plan seems to me to do that here which it is always necessary to carry into practice at the bedside; viz., to trace the effect to its exact cause. We shall thus have an arrangement, which, if not faultless, has at least the great recommendation of being convenient; while it may also serve to remind us that it will be useless to expect success in the treatment of these cases unless we attack the source of the hemorrhage instead of resting content with merely prescribing for the symptom.

In the first place, then, the subject of *hemorrhage as it arises*

from disease of the uterus, claims attention. During the early weeks of gestation, the great hypertrophy and vascularity of the uterine mucous membrane which naturally exists, together with the remarkable development that the whole glandular apparatus of the cervix then undergoes, predisposes to a sanguineous as well as to a leucorrhœal discharge; so that slight causes are sufficient to directly excite a flow of blood. It can be easily understood that this congestion is much increased by the coexistence of disease; and as readily may it be believed that amongst the disorders which particularly have this effect is *chronic inflammatory ulceration of the cervix*. This affection will generally be found to have existed prior to the occurrence of pregnancy; for although it may prove the cause of sterility in newly-married women who have never conceived, yet it does not appear so frequently to have this effect in females who have previously had children. The prominent symptoms which are produced by inflammation and ulceration of the cervix are these: A profuse mucous or muco-purulent discharge; a sensation of pelvic weight and bearing-down; continued pain in the back, particularly over the sacrum, which is increased by fatigue; and sometimes pain in the ovarian regions, which is occasionally very severe. Sexual intercourse also causes suffering, and very generally brings on slight bleeding. On practising the touch, an educated finger readily detects abrasion of the mucous membrane, combined with a pulpiness of tissue; while on introducing the speculum the labia will be found presenting a vivid red and velvety and granular appearance, and giving exit to a muco-purulent or sanguineous discharge. Not unfrequently the granulations have a fungoid appearance, almost resembling in their luxuriance an extensive malignant ulcer; and the os uteri is then found somewhat patulous. The whole cervix is also soft and congested, and after the first few months of gestation is directed backwards towards the sacrum; but these conditions are quite normal under the circumstances, and are not dependent upon the morbid state of the textures.

The fact has already been pointed out that the attacks of hemorrhage to which this disease gives rise not unfrequently occur periodically; so that they have been mistaken for the catamenial flow. But it must be allowed that more generally the discharge of blood happens much too often to simulate menstrua-

tion; coming on after any extra exertion, or even following upon sudden mental emotion. At the same time, the hemorrhage, though easily produced, is neither continuous nor very abundant, and it probably ceases spontaneously on the patient assuming the recumbent posture,—a position by the by that is often the only one which affords any relief to the lumbar pain. Such being the chief symptoms, it is not surprising that the general health should be considerably diminished below the normal standard. The patient soon becomes weak and loses flesh. Any extra exertion distresses her. There is mental depression; and frequently great irritability is manifested on trifling matters. She is also troubled with constipation, nausea, headache, attacks of faintness, vertigo, and palpitation; and in not a few cases by aggravated sickness. The feeble condition of system thus engendered predisposes to abortion; while if the inflammatory congestion of the uterus proceeds to an excessive degree, it may at once provoke this accident by causing disease of the placenta and death of the fœtus.

The object of our treatment must be to heal the ulceration; a desideratum which can only be obtained by a skilful combination of constitutional with local remedies. But before taking charge of the case it will always be advisable for the practitioner to explain to the patient and her friends the danger which exists of the disease producing miscarriage; as otherwise, should premature expulsion of the fœtus happen, it might very unjustly be attributed to his efforts to effect a cure.

The constitutional treatment will vary with the exact condition of the patient; but it will always be necessary to advise perfect rest in bed, the avoidance of sexual intercourse, complete mental tranquillity, and a light nutritious diet. Supposing the circumstances to permit of it, benefit will generally accrue from allowing a moderate quantity of some light wine, particularly such as champagne, sparkling moselle, hock, or claret. In many instances a little brandy and water twice or thrice in the day is of advantage; but I have always found harm arise from the use of malt liquors. As regards medicines, my favorite remedy is the perchloride of mercury; of which from the one-sixteenth to the eighth of a grain may be given thrice in the day, either in solution or in a pill with two or three grains of conium. If there be much weakness the compound tincture of bark in one or two

drachm doses three times a day, or the officinal liquid extract of yellow bark in the proportion of ten or fifteen minims to an ounce of peppermint water, will be found invaluable.

The local remedies will be of the same character in most cases; since we desire the removal of the fungoid granulations, and their replacement by healthy tissue. Hence the cautious use of caustics must be at first relied upon; the acid nitrate of mercury being required in severe cases, whereas in milder instances the nitrate of silver will usually suffice. Directly the state of the parts is reduced to that of a simple abraded surface, I have found no agent have such a good effect as the undiluted solution of the subacetate of lead, which should be freely applied, through the speculum, every second or third day. At the same time the cure will be hastened by the patient's using properly a vaginal injection night and morning; which may be formed either of alum and decoction of oak bark, or of sulphate of zinc and water, or of the solution of subacetate of lead in the proportion of half an ounce to a pint of rain-water.

Pregnancy is occasionally complicated with *fibrous polypus of the uterus*, but I have not seen any marked symptoms produced thereby during the term of gestation. The injurious effects resulting from these tumors are manifested at the time of parturition; when they are liable to impede the labor, or to give rise to hemorrhage after the expulsion of the child by preventing due contraction of the womb. Even growths which are of small size, and which perhaps have given no indications of their existence prior to fecundation, may prove very troublesome at the time of labor; inasmuch as there is every reason to believe that they participate in the general development of the uterus, and gradually attain a considerable bulk.—A lady who was under my care a few years back, suffered from profuse attacks of hemorrhage during the first three months of pregnancy; for the relief of which large doses of every variety of astringent had been prescribed in vain. On examination, two *mucous polypi* not much larger than peas were found developed on the anterior lip of the womb; on the removal of which little growths by torsion and scraping, all bleeding ceased. Labor subsequently came on at the proper time, and a healthy child was born without any untoward occurrence.

A few words must suffice on the subject of hemorrhage as it arises from *uterine cancer*. It is strange that a woman afflicted

with this dire malady should not have her fertility destroyed; but even the existence of ulcerated carcinoma does not seem to prevent fecundation, though it renders the process of childbirth one of extraordinary danger and fatality. Fungoid or medullary cancer is by far the most frequent variety of malignant disease which attacks the uterus; scirrhus or hard cancer being particularly rare in this situation. There are four prominent symptoms of ulcerated carcinoma,—viz., the cancerous cachexia, pain, an offensive watery discharge, and hemorrhage. The first is so strikingly peculiar and well-marked that from it alone the nature of the constitutional disorder may be diagnosed by the tutored eye; while the merest tyro cannot confound it with the appearance produced by anæmia from hemorrhage, or with that which characterizes tuberculosis. The pain is generally severe in proportion as the disease is far advanced; and very often amounts to the most frightful agony in the latter stages. The watery discharge is not only abundant, but commonly very unpleasant and fetid, owing to its admixture with particles of the decaying tissue of the affected part. In some cases there is a continuous, though not abundant, draining of blood; in other instances there is merely a periodical sanguineous discharge, simulating an abundant catamenial flow; while in a third class we find profuse gushes of blood, coming on without any warning at intervals of a few days, and being succeeded by a lightly-colored serous discharge. The duty of making a vaginal examination when a patient labors under the foregoing symptoms is so obvious that it would be almost impertinent to insist upon it, did not experience show that the practice is still not unfrequently neglected. By such an examination the nature of the disorder is at once ascertained; for in at least 98 per cent. of the cases of uterine cancer the disease begins in the cervix, and not in the body of the womb.

In epithelioma, and in that peculiar disease—corroding or rodent ulcer—first described by the late Dr. John Clarke, there is a watery discharge; but it is not usually fetid, since there is not the same decay of tissue as in ulcerated carcinoma. In the former disease also, the large granular outgrowth—commonly known as cauliflower excrescence—readily bleeds; while the same thing often happens, though to a less extent, when the affection assumes the form of an intractable ulcer.

In the second place, hemorrhage as it is *a precursor of abortion* demands our notice. Whatever cause destroys the connection between the ovum and the uterus will give rise to a discharge of blood. Until about the fourth month of gestation, the separation may occur at any part of the ovum; this body being attached by its membranes to every part of the uterine parietes. But subsequently, when the placenta is formed, it is of course only at the seat of attachment of this organ that disruption takes place. The abundance of the hemorrhage will directly depend upon the extent of placental detachment, and the age of the pregnancy. Moreover, in the early months, the result will in some degree be regulated by the seat of separation: for if it happen just above the cervix no ill consequences to the mother or fœtus may ensue; whereas when it takes place at the fundus, the blood in its course downwards necessarily increases the mischief by still further rupturing the connecting medium. With some women very slight accidents suffice to separate the ovum from the uterus, and the former comes away easily after a few gushes of blood. Yet every now and then the union remains firm at one or more parts; the patient having attacks of flooding for days or even weeks, until the entire separation is effected.

The general symptoms of abortion, the dangers which arise especially from the hemorrhage, and the appropriate line of practice to adopt in all these cases, are points which have been so fully treated of in the chapter devoted to this subject, that further observations here are unnecessary. But before passing onwards there is one peculiar class of cases which must not be overlooked; the important feature in which is that the blood effused from the utero-placental circulation, instead of escaping by the vagina, is retained in the womb. A few of these interesting examples of *concealed accidental hemorrhage during gestation* have been recorded by various authors; and from them the two prominent facts may be gleaned, that the early symptoms are obscure, while the danger to life is very great. In a case which occurred in my own practice some few years ago, and which I fully reported at the time,[1] it appeared to me that death would certainly have resulted had not the patient been seen at an early stage, and the nature of the accident been promptly recognized.

[1] The Medical Times. London, 18th October, 1851.

The symptoms produced by this condition are just those which are due to loss of blood generally; with this important addition, that the uterus is found tense and distended and perhaps irregular in form, while it also gradually enlarges as the disposition to syncope increases. Of course, too, the results are more appalling in the late than in the early months; for not only do the blood-vessels get larger and larger as the time of parturition approaches, but the uterus seems then to be capable of greater expansion. Moreover, the uterine veins, though developed to an extraordinary size, have very feeble walls, and during gestation at least are destitute of valves; so that rupture easily occurs from any cause which produces engorgement of the venous apparatus. The necessity for a very guarded prognosis will be apparent from the fact, that seven mothers perished out of the ten published instances of concealed hemorrhage with which I am acquainted. In the fatal cases the accident occurred at the full term; whereas of the women who recovered two were seven months and a half gone, while my patient was eight months and a half advanced. In almost all the cases the children appear to have been stillborn.

The indications for treatment are twofold: namely, to stop the hemorrhage, while we support the vital powers. The formation of coagula in the open mouths of the utero-placental vessels will be best encouraged by the application of cold to the abdomen, by maintaining the strictest quiet, and by the administration—if time allow—of full doses of gallic acid. If, however, there be reason to suspect that the bleeding is continuing, no time should be lost in effecting delivery; for which purpose the membranes are to be ruptured, the uterus is to be excited by ergot of rye and galvanism, the activity of parturition is to be aided by the proper use of the binder, and the os is to be dilated with the fingers. As soon as the condition of the parts will safely allow of interference, the labor should be completed by turning, or by the application of the forceps. In all cases the strength must be kept up by stimulants, in quantities proportioned to the prostration; while rather than let the patient die from exhaustion, transfusion of blood ought to be resorted to.

Thirdly and lastly, we have to take into consideration the interesting subject of *unavoidable hemorrhage*. This term is applied to that variety of flooding which happens from the implantation

of the placenta over the os uteri, since the very process by which the child is to be ushered into existence is the procedure which gives rise to it. To enter into a full account of the important subject of placenta prævia on the present occasion, would, I apprehend, answer no useful purpose; while a discussion of the various opinions entertained regarding it would certainly be out of place. My aim is simply to put the practitioner on his guard, and to show him that frightful attacks of hemorrhage may take place during the last three months of pregnancy from this source.[1]

The mode in which the insertion of the placenta over the os uteri acts as a cause of hemorrhage during the last three months of gestation, as well as in the course of labor, requires explanation. Most writers state that up to the fifth calendar month pregnancy chiefly affects the body of the uterus; but that after this time the neck also undergoes important modifications. This part, it is said, then experiences a diminution in length, accompanied by a considerable expansion of its superior portion on a level with the internal orifice. The placenta being fixed cannot follow this spreading out of the upper part of the cervix, and hence its bond of union with the womb becomes more or less ruptured. But unfortunately for this view it seems certain, as has already been explained, that the neck does not shorten nor spread out at its superior part in the way which has been so long supposed; since on the contrary it preserves its whole length until the last fortnight of pregnancy. Hence we must seek for another solution of this circumstance; and the most plausible one with which I am acquainted is that given by M. Cazeaux. This gentleman says: "During the first six months of gestation the uterus is developed more especially at the expense of the fibres of the superior part of the body or fundus of the organ; while in the last three months the fibres appertaining to the lower third of the womb are developed in a rapid manner, and the cavity of the organ is enlarged in consequence of the distension and growth of this lower part; a proof of which is, that the body of the uterus, which was pyriform in the earlier months, is perfectly ovoidal in shape towards the close of pregnancy; and I will further remark, that the development of the placenta is

[1] For an exposition of the whole subject the reader may be referred to Dr. Robert Barnes's lectures on The Physiology and Treatment of Placenta Prævia. London, 1858.

far more rapid in the first six than in the last three months. Now, this double circumstance seems to me quite sufficient to account for the production of hemorrhage; for when the placenta is attached to the fundus, its growth is simultaneous with the enlargement of that portion of the uterine walls on which it is implanted, and it is evident that no hemorrhage need occur; but when the after-birth is inserted over the cervix uteri, or on some adjacent point, the contrary must necessarily ensue, because the growth of the placenta is nearly completed, whilst a more considerable extension of the lower third of the womb has yet to take place. Of course, the placenta can no longer participate in this rapid development, by conforming to the increase of the uterus, and by following the extension of the wall on which it is inserted; and hence it spreads out from the centre towards its circumference, the fissures between the cotyledons become larger, and its different lobes are thus widely separated; but the growth of the inferior wall of the uterus is so rapid in the latter months, that this mechanical enlargement of the placenta, on which M. Jacquemier has particularly insisted, is no longer sufficient to prevent the tension of the utero-placental vessels, or of the cellular tissue in which they ramify; and this tension being ultimately carried to an extreme, all of these cellulo-vascular adhesions give way and become ruptured, and this gives rise to the production of hemorrhage."[1] M. Cazeaux then goes on to show that this theory explains the hemorrhages which occur when the placenta is attached to the lower part of the womb, or some point adjacent to the internal orifice; for it is not because the after-birth is implanted over the cervix that a flooding takes place during the latter months of pregnancy, but because it is in relation with the inferior third of the uterus.

The treatment of these attacks of flooding prior to the setting in of labor can never be otherwise than a matter of considerable anxiety; for a false step is very likely to be speedily fatal. At the time of the discharge, all those measures usually recommended in cases of uterine hemorrhage from any cause ought to be resorted to; and care must especially be taken that the patient is kept absolutely quiet in the horizontal position, with but little bed-clothing, and in a well-ventilated apartment.

[1] A Theoretical and Practical Treatise on Midwifery, &c. By P. Cazeaux. Second American, translated from the fifth French Edition, by W. R. Bullock, M.D., p. 684. Philadelphia, 1857.

Cold or even iced acidulous drinks may be given freely with advantage; while cloths dipped in vinegar and water can be applied to the vulva and over the lower part of the abdomen, unless the skin is chilled and clammy, and the pulse small and feeble. When the loss has been inconsiderable, when there is no reason to fear the occurrence of premature labor, and when the system is excited, it will often be useful to give a dose of opium; two grains of the extract in a pill being a good form, unless the enema opii of the British Pharmacopœia be preferred. But if the flooding is profuse and continuous, and the os uteri undilated, agents which are calculated to have an immediate and more decided influence must be resorted to. Of these the chief is the tampon or plug, which is best formed of cotton-wool; although strips of linen, bits of charpie, or common tow, will answer the same purpose. Whichever substance may be chosen, its efficacy will probably be increased by saturating it with vinegar; and small portions of it are then to be introduced, one after the other, right up to the orifice of the womb, until the vagina is closely packed. In one instance which I had recently to treat, the hemorrhage was readily stopped for a time by soaking a small piece of wool in a strong solution of the perchloride of iron and passing it right up between the lips of the uterus, the plugging being completed with plain wool in the usual way. The practitioner having controlled the bleeding by this means must still carefully watch his patient; partly because it will be requisite to administer stimulants in proportion to the need for them, but particularly for the reason that the plug sometimes excites uterine contractions through the irritation which it directly produces. Thus, cases have occurred where at the end of a few hours the tampon, coagulated blood, and fœtus, have all been suddenly expelled together.—Supposing that the flooding continues, and that the mouth of the womb is only slightly dilated, it will be advisable to resort to the detachment of that portion of the placenta which is implanted within the cervical zone of the uterus, as recommended by Dr. Barnes. This operation is easily performed by the introduction of one or two fingers; and hence is feasible when total detachment is quite impossible. But if the flow has been great and is continuing in spite of this operation, if the loss has induced great prostration, and if the mouth of the uterus is dilated, it will then be better to pass a

couple of fingers up between the placenta and uterine wall and rupture the membranes at once; afterwards endeavoring to increase the force of the uterine contractions by the binder, as well as by two or three full doses of ergot. Should the bleeding cease, the accoucheur will merely have to wait for labor pains, and act as in a natural labor; but if it continue in spite of the evacuation of the liquor amnii, it only remains for him to resort to turning immediately the parts are sufficiently dilated to admit of the introduction of the hand without the employment of undue force. The greatest caution, however, will here be requisite; since a rupture of the cervix, even though it be only slight, will probably be fatal, owing to the great size of the vessels of this part when the after-birth has been implanted over it.—In conclusion, the principle cannot be too strongly inculcated that each of these serious and responsible cases must be treated according to the exact nature and urgency of the symptoms which are present, and not after any set rule. There is no one particular line of practice which can be safely adopted in all instances. The obstetrician having diagnosed placenta prævia, cannot turn to his dictionary and be guided by its absolute statements. Not unfrequently but little or no help is required; and in such, well-meant interference will only prove a very serious incumbrance. On the other hand, there are cases where life can only be preserved by the most prompt and skilful action. Thus the ability of the physician will often be put to the test no less in distinguishing between these two classes, than in effecting the appropriate proceeding.

CHAPTER XII.

THE DISPLACEMENTS OF THE GRAVID UTERUS.

1. Prolapsus of the uterus.—2. Anteversion of the uterus—Anteflexion.—3. Retroversion of the uterus—Retroflexion.—4. Hernia of the uterus—Hernia of the unimpregnated organ—Hernia of the ovary, and of the Fallopian tube—Hernia of the gravid uterus.

1. Prolapsus of the Uterus.—The fact has already been mentioned, that as soon as pregnancy takes place the uterus sinks deeper into the cavity of the pelvis than it was before. This it does in consequence of its increased weight; and it need scarcely be said, that the more roomy the pelvis, and the greater the relaxation of the uterine ligaments and vaginal tissues, the lower will be the position taken. The mere occurrence of pregnancy, therefore, favors for a time the descent of the womb; and hence it can scarcely be deemed surprising that cases of prolapsus occasionally require treatment at the hands of the physician. Indeed, the wonder is that examples of this affection are not much more commonly met with than they really appear to be.

The descent of the uterus during gestation, as at other times, may be partial or complete,—in other words, there will exist either prolapsus or procidentia. In the first instance the uterus rests upon the floor of the vagina, with its lips perhaps just visible externally; in the second, the organ is protruded outside of the genitals, and hangs down between the upper part of the thighs. Either form of displacement may occur suddenly after fecundation; or complete procidentia can come on gradually as an aggravated condition of a pre-existing prolapsus. As pregnancy advances to about the fourth month, and as the uterus rises out of the pelvic cavity, a spontaneous cure usually becomes effected; although more than one case is known, extraordinary as it may seem, where the displacement has continued until delivery.

The symptoms which result from this condition vary some-

what according to the capacity of the pelvis. Speaking generally, complaint is made of considerable discomfort, of bearing-down pains, of a sense of weight in the lumbar region and in the groins, of more or less difficulty in micturition, and often of very troublesome constipation. Moreover, there is always a risk of the irritation which the rectum and bladder experience being reflected to the uterus, so as to give rise to premature contractions and abortion.

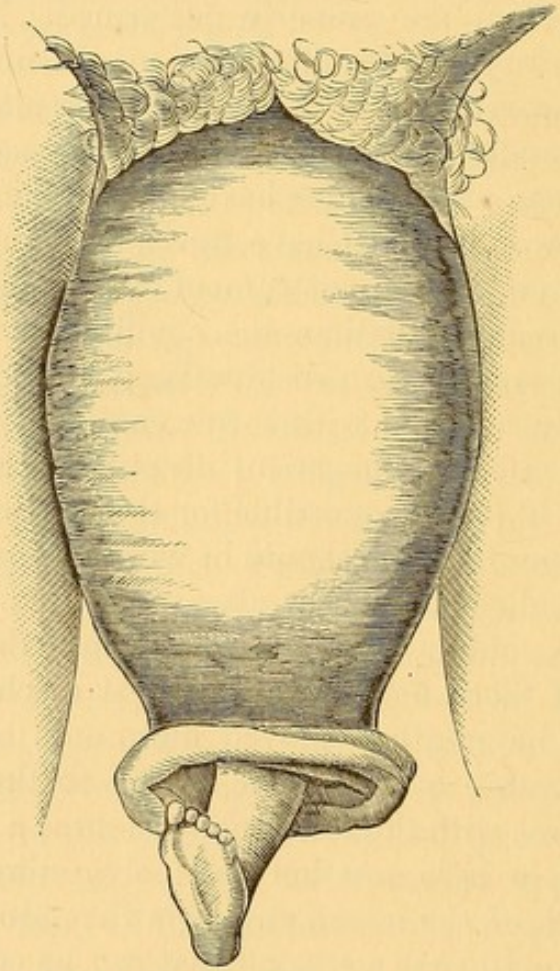
In cases of simple prolapsus all that need be done in the way of treatment is to recommend the recumbent position to be maintained for a time; while care is taken that the functions of the bladder and rectum are properly performed. Indeed, especial caution is necessary lest the power of micturition be interfered with; for in one recorded instance a fatal result ensued, chiefly owing to the bladder having been allowed to become excessively distended. Some practitioners have advised the use of a pessary to support the womb; but I have never seen an instance where the introduction of such an instrument during pregnancy seemed aught but a greater evil than the condition it was desired to remedy.—With regard to procidentia, it is necessary that the uterus be gently returned within the vagina; while its further descent is prevented by the patient keeping her bed for some few days at least. If it be impossible for this amount of rest to be obtained, a proper bandage should be worn to support thoroughly the perineum and genital organs, after reduction has been effected. The use of the cold or tepid salt-water hip bath is always beneficial; while if there be any leucorrhœal discharge, astringent injections may be gently employed night and morning. Sometimes the reduction is impossible, owing to the uterus having formed adhesions with the contiguous viscera; a condition which may terminate in inflammation and pelvic abscess, as the progressive growth of the womb stretches the false membranes or ruptures them. In such a case all that can be effected is to support the uterine tumor by a perineal bandage, while the patient is confined to the bed or sofa.

Amongst the marvellous cases which occur, once in a way, in the practice of medicine, are those where complete procidentia of the uterus takes place towards the end of gestation, or even during the progress of parturition. Sometimes this has happened

when there has been a head presentation: occasionally, as in the drawing, the foot has been the advancing part.

The treatment of a case of procidentia uteri during labor requires to be promptly carried out. The principal point is to effect delivery at once, and then to replace the womb in its normal position. Unless the placenta has become detached immediately after the birth of the child, I would particularly advise the displacement to be reduced prior to attempting the withdrawal of the afterbirth.

FIG. 16.



COMPLETE PROCIDENTIA OF A GRAVID WOMB AND INVERSION OF THE VAGINA, WITH FOOT PRESENTATION, IN A MULTIPARA 38 YEARS OF AGE. (After Wagner.)

When a woman has suffered from a falling of the womb under any of the circumstances we have been considering, care should be taken not to allow her to sit up too soon after delivery; since by proper rest during the puerperal period a radical cure may often be effected, whereas by neglecting this precaution the laxity

of the ligaments and of the vaginal walls will be increased, and a state of chronic procidentia induced.

2. Anteversion of the Uterus.—This displacement of the pregnant uterus is of very rare occurrence; so much so that many obstetric physicians in large practice have never seen an instance of it, and even deny the possibility of its occurrence. But although no well-marked example has ever come under my own notice, it yet seems to me impossible to doubt that complete anteversion does sometimes happen. Indeed, it is not very uncommon to meet with cases where the normal inclination of the uterus forwards is rather considerably increased, and slight irritability of the bladder thereby induced, at an early period of gestation; though in these, perfect rest for a day or two will serve to relieve the symptoms, and allow of the womb resuming its natural position. But it does not seem difficult to understand that some powerful cause may suffice to increase this incipient displacement; and hence for my own part certainly, I have no hesitation in accepting the statements which are made by authors who have met with undoubted examples of this malposition.

In anteversion of the uterus the organ lies transversely in the pelvic cavity; the fundus being directed forwards on to the bladder, while the cervix is tilted upwards and backwards towards the sacrum. The causes of this accident are probably such jerks and shocks as are produced by falls, efforts at vomiting, repeated straining at stool, and violent exertion in lifting heavy weights. The signs by which this displacement may be diagnosed are chiefly these: The os uteri is thrown upwards, almost beyond the reach of the finger, and completely facing the sacrum; while the fundus can be felt as a globular tumor in front of the vagina, just behind the symphysis pubis. The veins in the upper portion of the vagina are found enlarged and much congested. There will usually be more or less trouble in passing the urine, sometimes amounting to complete retention, this being due to the pressure exerted by the fundus uteri upon the meatus urinarius and the neck of the bladder. There may also exist constipation or troublesome tenesmus; though the rectum suffers much less than the bladder. Pain is felt in the lumbar and hypogastric regions in consequence of the dragging of the nerves. The patient is also greatly inconvenienced by a

constant feeling of fulness and heaviness about the pelvis; while she may even suffer acutely from severe paroxysms of forcing or bearing-down pain.

The reduction of an anteverted uterus ought always to be attempted with gentleness and care; the efforts, if they fail to restore the uterus, being discontinued after moderate perseverance, since otherwise they are not unlikely to cause abortion. To effect replacement, it is necessary that the bladder and rectum be thoroughly emptied: the former by the catheter, and the latter by a large stimulating enema. The patient may generally be placed under the influence of a mixture of chloroform and ether with advantage. She is then to be turned on to her left side; and two fingers being introduced into the vagina, the practitioner makes gentle but steady pressure in an upward direction, on the fundus of the uterus as it is felt through the anterior part of the walls of this canal. If there be any difficulty, a small sharp hook, something like an ordinary tenaculum with a long handle, had better be passed firmly into the posterior lip of the uterus; so that by moderate traction downwards and forwards the cervix may be pulled towards the pelvic outlet, at the same time that the fundus is pushed upwards. After reduction has been safely accomplished, a full dose of opium can be at once advantageously administered; while the patient is to be kept for several days in a recumbent posture. I have no doubt but that in the majority of cases, the uterus if left alone could right itself as gestation advances; but as in the mean time the patient would suffer much pain and inconvenience, it will be better to save her from this by the proceeding just recommended, always provided it can be accomplished without compromising the safety of the fœtus.

In *anteflexion of the uterus*, the organ becomes more or less completely bent upon itself; so that while the fundus is thrown forwards upon the bladder, the cervix retains its normal position in the centre of the vagina. The point of flexion is generally at about the union of the cervix with the body, or perhaps just above this part. Speaking generally, it will be better not to attempt reduction. The following is a good illustration of this displacement:

A lady, thirty-three years of age, the wife of a medical man, in the first month of her pregnancy, fell down a flight of steep stairs. At the time the

bowels were exceedingly constipated. There was no hemorrhage; but a state of syncope lasted for nearly an hour. For the ensuing six or seven weeks she was never free from a heavy bearing-down sensation in front; which rendered micturition frequent and painful, but in no way interfered with defecation. She was also irritable and feverish; and it was thought by the husband that the womb was retroverted. Dr. Ashwell first saw her at the end of the third month; and on examination found the cervix uteri in its natural position, while the fundus was lying forwards between the anterior wall of the vagina and the bladder, being felt in the form of a round solid tumor. The cervix was more elongated, fuller, and harder than natural; the os was open; and pressure at the point of flexion caused pain. Attempts were made to effect reduction by placing the fingers of the left hand behind the pubis, so as to raise the fundus, while the forefinger of the right hand was employed to draw the cervix downwards and forwards. As these efforts failed, the case was left alone. An examination at the sixth month satisfied the husband that the curvature had nearly disappeared; and although the patient was not quite free from suffering during the remainder of her pregnancy, yet she was delivered without any difficulty, and completely recovered.

3. Retroversion of the Uterus.—The uterus in retroversion is thrown completely backwards from its normal erect attitude; so that the fundus gets impacted in the hollow of the sacrum, while the cervix and os are carried upwards and forwards behind the symphysis pubis. Thus both the bladder and rectum become unduly compressed; while the vagina is drawn upwards and forwards by the neck of the womb. This displacement may occur at any stage of pregnancy, though it happens much more frequently during the first three or four months than at any other time. It is also exceedingly rare in primiparous women.

A correct explanation of this important disease would appear, as far as I can learn, to have been first given in France, by Desgranges, in the year 1715, and subsequently by Gregoire in 1746; while in this country the attention of the profession seems never to have been directed to the matter until October, 1754, when William Hunter delivered a public lecture upon a fatal example of it. Some sixteen or seventeen years later the nature of this affection was so little understood that Dr. Hunter again gave a description of it to the Medical Society, on which occasion he concluded his essay in the following words:

In the last place, gentlemen, give me leave to tell the public why you thought some account of the *retroverted uterus* so necessary. You were well assured that it happens frequently, and yet that a number of practitioners know but little of it; so little indeed, that, as you well know, in this town, within these two years last past, two pregnant women lost their lives by this accident, without the cause of their complaints being discovered till after

death. In both of these cases, the symptoms alone were almost sufficient to determine the nature of the complaint; and the circumstances of the tumor with regard to the vagina and rectum such, that it would now appear to be impossible that an experienced practitioner should mistake the case. Yet, in both of these instances, experienced practitioners failed; and saw with regret in the dead body, what they might have easily cured in the living, if they had made a very obvious discovery in a proper time.[1]

This displacement of the uterus may either come on gradually, or it may happen suddenly. In the first case, it is perhaps sometimes due to the antero-posterior diameter of the pelvic brim being unduly encroached upon by a large sacral promontory, under which projection the gradually enlarging uterus hitches; so that this organ instead of rising out of the pelvis has its fundus slowly thrown backwards into the curve of the sacrum. This condition gives rise to little or no disturbance until the uterus attains a size sufficient to compress the bladder and rectum; but then the usual symptoms immediately become manifested. Retroversion can also occur slowly from habitual constipation; owing to the accumulated fæcal matters in the sigmoid flexure of the colon and upper part of the rectum producing constant pressure upon the fundus. When the displacement is effected suddenly, it generally takes place from some violent exertion; such as long-continued straining to expel hardened fæces, a severe attack of vomiting, attempts to lift heavy weights, and falls. Many authorities assert that a distended bladder may either gradually push the fundus backwards, or may do so suddenly under the impulse of a violent straining to void the urine; but the relations of the bladder to the anterior wall of the abdomen would seem to me quite sufficient to prevent this viscus from having the effect supposed. The retention of urine which accompanies these cases is the consequence and not the cause of the disease.

There is one symptom which is particularly striking in this affection, and which cannot fail to attract attention. The pressure exerted by the misplaced uterus upon the neck of the bladder at first partially, but at length completely obstructs the flow of urine; and hence results retention, with an uncontrollable desire to empty the bladder, and frequent but fruitless straining efforts. The sense of pressure upon the rectum also gives rise, though in

[1] Medical Observations and Inquiries. By a Society of Physicians in London. Second Edition, vol. iv, p. 409. London, 1772.

a less marked degree, to a constant feeling as if the bowels were loaded; and consequently numerous attempts at defecation are made. Should these symptoms pass on unrelieved, the bladder speedily becomes enormously distended. As a consequence, the urine decomposes in this viscus, giving rise to all the dangerous symptoms of uræmia; and the coats of the organ either inflame and ulcerate, or they rupture mechanically from over-tension. Whichever happens, the result is of course the same,—the escape of the urine into the peritoneal cavity, and speedily fatal inflammation of the serous membrane. The woman may, however, perish from the blood-poisoning caused by the absorption of the foul ammoniacal urine before the bladder has had time to rupture, for it is astonishing to what an extent the coats of this organ will gradually stretch; or she may die from the same cause after the urine has been all drawn off, in cases where the catheter has not been used until the system has been too profoundly affected by the morbid fluid. Moreover, in many instances a few ounces of urine dribble away in the course of the day; and this not only delays the time of rupture, but is calculated to mislead the practitioner, who thinks the bladder must be empty because he is told that the urine cannot be retained and is constantly escaping. This latter fact was well exemplified in the following case:

A woman, thirty-five years of age, quickly became the subject of enormous distension of the abdomen. On examination this enlargement was found to have partially the characters of extreme ascites, that is to say, there was dulness over the greater portion of the abdomen, and distinct fluctuation. A medical practitioner who had been called in by the friends was desirous of performing paracentesis, so urgent were the symptoms; but fortunately this operation was deferred, and the patient was removed to the Westminster Hospital, where she was placed under the care of Dr. Basham. On minutely inquiring into the history, it appeared that she was three months advanced in pregnancy; and as a catheter could not be introduced into the bladder, an examination per vaginam was made. This clearly showed that retroversion of the gravid uterus was present; which had probably existed for some three weeks, as the abdominal swelling had been forming from about that time. Urine, to the extent of a few ounces, daily dribbled from the bladder; and although this may have given some slight relief, yet the great prominence of the distended viscus made the patient feel as if she would burst. After a little care, the house-surgeon succeeded in pushing the fundus of the uterus upwards into its natural position; immediately upon the accomplishment of which, more than a gallon of urine flowed away spontaneously, without the aid of a catheter. The woman ultimately did well.

The diagnosis of retroversion is not a matter of difficulty.

The mere fact that a pregnant woman is unable to empty her bladder, that she has a constant desire for defecation, and that she complains of pain and pelvic weight, ought at once to lead the practitioner to institute a physical exploration. A glance at the abdomen must suffice to show that it is enlarged; while the sense of touch will in all probability detect fluctuation, if the retention have existed many days. On examining per vaginam, it will be found that immediately the finger enters this canal it encounters an obstacle in the shape of a firm globular body. This is the posterior surface of the uterus; which organ fills the whole pelvic cavity, like a tumor spread out much more posteriorly than anteriorly. No os uteri can then be felt; but if the practitioner persist, as he ought to do, in passing his finger in the only direction in which it will go, he will at length reach the mouth of the womb high up behind the pubes. An examination by the rectum confirms the fact that the pelvis is filled by a globular tumor. And the nature of the case is then confirmed beyond the possibility of doubt, by the introduction of a long flexible catheter into the bladder; by means of which this viscus will be emptied, and the abdominal tumor removed.

The prognosis in retroversion is always grave; and especially is it so when the displacement has existed sufficiently long to allow of the blood being vitiated by the decomposing urine. Moreover, the constipation and retention of urine are not only sources of great danger in themselves, but they serve mechanically to increase the displacement. This is clear from the fact, that the bladder cannot enlarge upwards without drawing up the uterine neck with it; whilst, as the pressure of the fundus uteri blocks up the rectum, of course the stercoraceous matters accumulate above the point of obstruction, and thus force the fundus lower and lower by their weight. Moreover, before the patient seeks advice, she very generally has exhausted herself with straining and bearing-down, which expulsory efforts merely serve to increase the mischief.

In the treatment of this accident, the first step is to carefully empty the bladder; for not only is the risk of rupture to be immediately lessened, but the equally great danger of uræmic poisoning is, if possible, to be obviated. This had better always be done with a flexible male catheter; the bladder being usually drawn up too high, and the urethra consequently too much length-

ened, to allow of the ordinary instrument being of any service. Then, if there should appear to be any passage through the rectum it will be advisable to administer copious soap and water enemata, with the tube of the stomach-pump passed above the obstruction; since the reduction of the uterus will be much facilitated by the previous dislodgment of the fecal matter which may be present. Sometimes the adoption of this line of practice is sufficient, and the uterus spontaneously assumes its normal position. More generally, however, the fundus has to be pushed upwards. But before attempting this operation, I make a point of administering an anæsthetic; for it is not only cruel to inflict unnecessary pain upon a poor woman already worn out with suffering, but the effect of removing all sensibility is exceedingly beneficial in preventing those violent bearing-down efforts which the patient, when conscious, can scarcely help making. The woman being insensible, and lying in the ordinary obstetric position, the accoucheur introduces his whole hand into the vagina; and then doubling it, he applies the flat surface of the first phalanges to the tumor, and presses the body and fundus of the uterus upwards and forwards in the direction of the sacral concavity. In one difficult case which was under my care, this proceeding was favored or assisted by passing a large elastic and empty pessary into the rectum, and then gradually filling it with water. The reduction will sometimes be effected at the first trial, though not uncommonly the attempt has to be repeated several times; in which event it must not be forgotten to frequently empty the bladder, if many hours are allowed to elapse between the operations. On making a third or fourth trial it may be better to place the woman in such a position that the superincumbent weight of the intestines are removed from the uterus. M. Godefroy succeeded in three very grave cases, by adopting the following plan: The patient rested her head and hands upon the floor, whilst the anterior part of the thighs and legs reposed upon the bed, where they were held by assistants, while this gentleman acted upon the fundus through the vagina or rectum. It would, however, have served quite as well to have had the woman on her knees and elbows; a position which is only objectionable because it does not well allow of the production of anæsthesia. Supposing the attempt, however made, to prove successful, a full dose of opium had better be administered, and the patient ordered to keep the recumbent posture

for several days; whilst if the coats of the bladder have lost their tone, the catheter ought to be introduced every eight or twelve hours, until full power is recovered.

But it sometimes unfortunately happens that the reduction is impracticable, and an anxious question then arises as to the course to be pursued. Hunter advised that the uterine wall and the fœtal membranes should be punctured under these circumstances, in order that the bulk of the uterus might be considerably lessened by evacuating the liquor amnii; and one successful case where this operation was performed through the rectum has been recorded. Nevertheless it seems to me that such a proceeding can very seldom, if ever, be necessary; since some little skill and much patience will enable the practitioner to introduce a stylet or uterine sound through the os uteri, and with it to procure the discharge of the liquor amnii. Even if this could not be accomplished it would generally be possible to induce uterine contractions by the administration of ergot, combined with the proper use of galvanism. Of course death will sometimes occur, in spite of the best treatment, as in the following instance, which is related by Dr. Blundell:

A lady, laboring under ovarian dropsy, was recommended to ride out daily in an open carriage. In one of her excursions, the vehicle was upset, and she was thrown out with great violence; her abdomen striking with great force against a stone which was lying in the way. On her return home, a very copious secretion from the kidneys ensued, with great abdominal pain; but in the course of a few days she recovered, and found herself entirely cured of the dropsy. Some time afterwards she married; and died with an irreducible retroversion of the uterus, at about the fourth month of gestation. Inspection of the body showed that the fall had produced a rupture of the ovarian cyst, and the effusion of its contents into the peritoneal sac, whence the fluid had been absorbed by the kidneys. The remains of the cyst, falling upon the uterus, had carried it down below the promontory of the sacrum; and the womb becoming retroverted, had been fixed by adhesions in its abnormal position. While the lady remained unmarried, she felt but little inconvenience; but on the uterus enlarging from pregnancy, fatal pressure on the bladder and rectum took place, as the displacement could not be rectified on account of the adhesions.

Dr. Henry Bond, of Philadelphia, has invented an instrument to aid in the replacement of the retroverted uterus, which Dr. Meigs says was successful in a difficult case that had resisted all other means. Having had no experience in the use of this instrument it may seem rather bold, if not rash, to condemn it; but it is necessary to recollect that when skilful efforts, perseveringly

employed, fail to procure reduction, we may be almost certain that abnormal adhesions have been established between the uterus and adjacent parts. To tear roughly through these false membranes, will be simply to produce hemorrhage, or acute inflammation; and either of these alternatives appears to me more fraught with danger than rupturing the membranes with the uterine sound, or than puncturing the uterus, or even than temporizing and merely trying to relieve the prominent symptoms.

It might be thought quite impossible that a woman should reach the full period of gestation with a retroverted womb; but the reader will find one extraordinary instance of this nature recorded by Dr. S. H. Jackson,[1] and another by Dr. Samuel Merriman.[2] In both of these cases the patients remained for nearly a week in labor, and suffered severely; but in each, at the end of some days, the womb was spontaneously restored almost to its natural position, and delivery completed. Both of the women recovered favorably; though the two children were born dead, while one was considerably decomposed.

Retroflexion of the uterus may occur during pregnancy, though it is much more seldom met with than retroversion. In the unimpregnated state just the reverse holds good. The typical course of a case of retroflexion, occurring during the early part of gestation, may be thus roughly sketched:

A woman thirty-five years of age, three months advanced in her fourth pregnancy, complains of severe attacks of sickness, constant bearing-down pains, great pain in the back, and of tenesmus with much suffering during defecation. For some days before seeking relief her feelings have been such that she has imagined abortion was about to occur; but she has generally derived relief from rest in bed. The functions of the bladder have not been interfered with. On making a vaginal examination, the uterus is found enlarged, with its fundus forming a globular tumor under the sacral promontory; but the cervix and os occupy their normal position. The explanation of this condition is clearly, that the uterus is bent upon itself, very much resembling the neck of a retort. The evacuation of the rectum, and the use of gentle pressure upon the fundus through the walls of the vagina, fail to effect replacement. The patient is therefore ordered to remain in bed, while she is kept free from pain by sedatives. At the end of a fortnight the retroflexion will be found to be less; and at the expiration of another month the uterus will in all probability be detected occupying its normal site.

[1] Cautions to Women respecting the State of Pregnancy, &c. Second Edition, p. 59. London, 1801.

[2] A Dissertation on the Retroversion of the Womb, including some observations on Extra-Uterine Gestation, p. 28. London, 1810.

Dr. Merriman was of opinion that pregnancy might go on for the full period with a complete retroflexion of the womb; and that this displacement might form an important and dangerous complication of labor. This view has recently been fully confirmed by a case which was under the care of Dr. Oldham,[1] in which there was found perfect retroflexion of the gravid uterus during labor at term. In this instance the nates of the infant presented; and delivery was safely accomplished, so far as the mother was concerned, by grasping a foot and withdrawing the child.

4. Hernia of the Uterus.—Hernia of the uterus or of its appendages is of very rare occurrence; but it is rather remarkable that of the recorded cases, the majority are examples of hernia of the gravid uterus. Hernia differs from eventration of the uterus in this respect; that whereas in the former case the womb passes through the inguinal or crural opening, in the latter it is forced through some artificial aperture—as between the recti muscles, &c., or through a wound in the abdominal parietes. For the thorough comprehension of this subject it appears advisable to speak, in the first place, of hernia of the unimpregnated uterus; secondly, of hernia of the ovaries; and thirdly, of hernia of the gravid uterus.

a. Hernia of the unimpregnated uterus. This accident can happen at the inguinal ring, or at the crural arch, or through the obturator foramen; while it may probably arise from too great relaxation of the ligaments of the uterus, or from displacement of the uterus by tumors within the pelvis, or from the contraction of bands of false membrane, &c. The diagnosis of this condition from ordinary intestinal herniæ will hardly be very difficult, if a vaginal examination be instituted; though without this a mistake is not unlikely to be made, since—as one of the following cases shows—the symptoms may at times resemble those due to strangulation of the intestines. An examination of the recorded cases of uterine hernia shows that pregnancy can occur, and full development of the fœtus take place, while the uterus remains in its abnormal position. The treatment of such an accident must depend very much on the length of time which has elapsed since its occurrence, and on the nature of the symp-

[1] Transactions of the Obstetrical Society of London. Vol. i, p. 317. London, 1860.

toms. When recent, it would seem not unlikely that cautious attempts at reduction might be attended with success; although supposing the manipulations to be fruitless, an operation would scarcely be justifiable, unless there happened to be severe suffering and constitutional disturbance.

Two instructive examples of this displacement have been recorded by M. Lallement:

In one, the patient was a laundress who had borne several children without experiencing anything remarkable. When about the age of fifty, the catamenia having ceased, a tumor suddenly appeared in the right groin after making some unusual exertion. Though at first painful, it soon ceased to be so, and she lived for twenty years afterwards. On making an examination of the tumor after death there was found a very thick hernial sac, containing the uterus and the right ovary and Fallopian tube: the left ovary and tube were pressing upon the external part of the inguinal ring; while the vagina, drawn up by the uterus, was compressing the bladder against the pubes. M. Lallement points out that this altered direction of the vagina is the most certain sign of the existence of an inguinal hernia of the uterus.

The second instance is an example of crural hernia of the uterus, occurring also in a laundress, after eight easy labors. At the age of forty, eight days after the birth of her last child and before resuming her ordinary occupation, she perceived a small protrusion in the right groin. Failing to reduce this, she took but little notice of it for a year, when an attack of colic and nausea caused her to apply a bandage for a short time. At seventy-four years of age she had symptoms indicative of a strangulation of the hernia, such as pain, nausea, vomiting, and colic; these symptoms partly disappearing after a copious discharge of serum from the tumor. From the age of seventy-four to eighty-two she continued subject to attacks of pain and nausea; until, one day, new symptoms of strangulation set in, which made her enter the infirmary of the Salpêtrière. At this time the tumor filled the right groin; it was about five inches long, and four broad; its shape was that of a three-sided pyramid, with the base above, and the apex below; and the finger when passed above the tumor could distinguish the inguinal ring in its healthy state, and immediately beneath the crural arch. After death the sac of the hernia was found to contain the uterus, ovaries, Fallopian tubes, the upper part of the vagina greatly stretched, two distinct folds of omentum, and two cysts—perhaps hydatids. It was a crural hernia. The rectum and bladder were in their normal positions.[1]

β. Hernia of the ovary. The ovary has escaped at the inguinal ring, or at the crural arch, or at the sciatic notch like an intestinal ischiatic hernia, or through the tissues of the vagina. The protrusion may take place on one side of the body only, or on both; it may exist from birth, or it will happen as the result of accident or disease; and the sac can either contain the ovary

[1] Dictionnaire des Sciences Médicales. Article Matrice. Vol. xxxi, p. 226. Paris, 1819.

alone, or with this there may be the uterus and the Fallopian tube, and even a portion of intestine. From the anatomical relations of the pelvic viscera it can be readily understood, that hernia of the ovary occurs more frequently at the inguinal ring than at any other part; the passage of the round ligament through the internal abdominal ring, and along the inguinal canal, to the labia majora, leaving—as it were—a weak point. This accident has been mistaken for an intestinal hernia, for an enlarged inguinal gland, and for an abscess; some interesting examples of which errors have been put on record by M. Deneux.[1] The case in which Mr. Pott removed both these glands is well known. The particulars, however, are so interesting that they may be mentioned here:

A young woman, twenty-three years old, was admitted into St. Bartholomew's Hospital on account of a small swelling in each groin. These swellings had been for several months so painful as to prevent her from following her occupation as a servant: they were soft and movable, and they lay directly upon the outside of the tendinous opening of the oblique muscle, through which they appeared to have passed. The woman was large breasted, and menstruated regularly; her general health was good. Owing to the inconvenience which the tumors caused, Mr. Pott determined to remove them; and having done so, they were found to consist of the two ovaria. The patient subsequently enjoyed good health, but became thinner and more muscular: her large breasts disappeared; and she never menstruated again. The last observation of her was made many years subsequent to the operation.[2]

The treatment here resorted to must not be regarded as exemplifying that which should be usually practised. For although the displaced ovary may be extirpated if it give rise to frequent attacks of pain or to considerable inconvenience, yet cases where an operation is called for are exceptional. Speaking generally, the less that is done the better; though, when the hernia is recent, attempts ought to be made at reduction, and if these efforts be followed by success, a bandage or truss should afterwards be worn.

Dr. Oldham has recorded two cases, in both of which the two ovaria are said to have descended through the inguinal canals and to have become permanently lodged in the upper part of the external labia. The patients were aged respectively nineteen and twenty; neither had ever menstruated; and the most careful

[1] Recherches sur la Hernie de l'Ovaire, pp. 37 to 58. Paris, 1813.
[2] The Chirurgical Works of Percival Pott. Vol. ii, p. 210. London, 1779.

and repeated physical examination failed to detect either uterus or vagina. One case presented the interesting physiological peculiarity of a spontaneous periodical increase of one or other of the ovaria, followed by its gradual reduction; thus—it is said—supplying direct evidence of an ovarian menstrual act.[1] This is really the important feature in the history; for otherwise there is but little to show that the patients were not males, having each a cleft urethra and scrotum, a very short penis, and with the testes just drawn out of the inguinal canal. Without doubting the correctness of Dr. Oldham's views on these cases, it is still certain that many instances of the malformation I have mentioned closely simulate female development; while sometimes the similarity is so great, that without a minute examination of the bodies themselves, it cannot really be determined whether they are testicles or ovaries.

A few examples of hernia of the Fallopian tube alone are recorded. In one instance, the displacement took the form of a crural hernia. As the sac was thought to contain fluid, it was punctured; the patient afterwards dying from peritonitis. At the autopsy, the sac was found to contain nothing but the hypertrophied oviduct.

γ. Hernia of the gravid uterus. In considering the chief circumstances which follow from this remarkable casualty, it need scarcely be premised that this variety of hernia is of exceeding rarity. The recorded cases are not, however, on this account the less interesting; neither does such a circumstance render it the less imperative for the practitioner to be acquainted with their nature.

The protrusion of the gravid uterus at the umbilicus has been met with more frequently than any other variety. Dr. Evory Kennedy says that he met with a remarkable example, in a woman who had borne a number of children. When in labor of her second child, hernia took place at the umbilicus, which gradually increased in extent with each child she carried; until at length the impregnated womb made its way completely out of the abdomen, and became suspended over the pubes, so that at the end of the ninth month it hung down to the knees.[2] A more recent example has been published by Dr. G. C. P. Murray:

[1] Proceedings of the Royal Society of London. Vol. viii, p. 377. London, 1857.
[2] Observations on Obstetric Auscultation, &c., &c., p. 40. Dublin, 1833.

The patient was a woman aged thirty, the mother of three children, and had been from infancy affected with a small umbilical hernia, which had always been easily reduced. When in the eighth month of gestation she found one morning, in rising suddenly from the recumbent position, that a large tumor had forced itself through the navel. This protrusion proved to be nothing less than two-thirds of the impregnated uterus, the fœtus being distinctly recognized by palpation. There was no rupture of the linea alba. Reduction was at once effected by means of gentle and careful manipulation, and the organ was happily kept *in sitû* until the end of gestation, when a live female child was born.[1]

I believe that no instance of hernia of the gravid uterus at the inguinal ring is known to have occurred in our own country; and probably not more than five or six examples are to be found recorded in medical literature. Sir David D. Davis[2] refers to four; and one has been seen since the publication of his work. As the particulars of this last case are very instructive and interesting, I shall here conclude by quoting it, in place of making further general observations. The details are as follow:[3]

On the 26th January, 1839, Professor Ladesma was called to visit in consultation Elena Ramos, aged forty-two, a married woman residing at Salamanca. She was strong, and in the enjoyment of good health. The belly was soft and natural. At the inferior part of the hypogastrium there was a large tumor resting upon both thighs, but especially on the right one. Its base, or origin, was situated at the upper and right part of the mons veneris, extending over the superior portion of the pelvis, involving the integuments of the lower part of the belly of the same side, descending and prolonging itself so as to comprehend the labium and put it in an extreme state of tension. The base of the tumor at this time—26th of January—measured about twenty-two inches: its circumference at the middle was twenty-five: and its whole length twenty-three inches. These dimensions became afterwards very different, the circumference of the neck diminishing, and that of the middle greatly expanding, so as to give the tumor an oval shape. It became subsequently more spherical, after using for some time a suspensory bandage slung from the shoulder. The common integuments covering the tumor were almost of their natural color; but were a little œdematous, and marked with a few slightly varicose vessels. Upon examining the tumor with the hand, Professor Ladesma detected within it a fluid, in which was floating a solid body. During the various manipulations, the patient suffered no inconvenience, nor did she experience any peculiar sensation. She believed that she was with child, and thought she felt the fœtus moving within the tumor.

[1] Transactions of the Obstetrical Society of London. Vol. i, p. 77. London, 1860.

[2] The Principles and Practice of Obstetric Medicine. Vol. ii, p. 912. London, 1836.

[3] Fenómeno Raro de Preñez; o Historia de una Hernia de la Matriz, &c. By Don Julian Ladesma, Professor of Surgery at Salamanca, 8vo., p. 23. Madrid, 1840 —Condensed from Dr. J. R. Cormack's Contributions to Pathology, Therapeutics, and Forensic Medicine, p. 43. London, 1844.

The following was the previous history of the patient. She had borne six children in an easy way; having always had such good recoveries, that she was able to attend to her household duties a few days after labor. Before marriage she was subject to a reducible inguinal hernia, which became more troublesome after the birth of her first child. For four months prior to the appearance of the tumor she had not menstruated; and at the time the tumor appeared she believed herself to be three months gone with child. It first presented itself under the following circumstances: One day when on foot in the street, and stooping down to a table to purchase some household necessaries, she felt an uneasy dragging sensation in the lower part of the left side of the abdomen. Feeling sick, she went home. For a short time, blood dropped from the vulva. Upon examining the groin affected with hernia, she found a tumor in the situation of the usual hernial protuberance, but having a different consistence; at the same time she noticed that her abdomen had lost somewhat of its former elevation. The pain which she suffered in the swelling caused her to have recourse to all the means of reduction which she had formerly been in the habit of successfully employing; but though she continued her efforts for some time, they were useless. In her manipulations she did not discover a fœtus; but in six or seven weeks after the descent of the tumor, she felt movements in its interior, and became reassured of her pregnancy. Under these circumstances she consulted two medical men, who decided that the tumor contained a fœtus, and that it was a case of *extra uterine conception*. Professor Ladesma, on the other hand, gave it as his opinion that it was *a hernia of the womb, which had issued from the right inguinal ring, carrying with it the product of conception, and constituting a secondary hernia*. He further declared that reduction was impracticable, and that when the patient came to her full time it would be neccesary to deliver her by a surgical operation.

A committee of the medical authorities of Salamanca met in the patient's house upon the 2d March; and after an examination by the vagina, in which the os uteri could not be discovered, it was agreed that Ladesma's opinion was correct.—The patient went on well. The stethoscope was frequently applied; and both the placental and fœtal pulses were found to differ very much, one day from another, while occasionally the former became inaudible for a few minutes. The sounds of the heart were very distinctly heard to be double; while the beats varied from 130 to 150 in a minute, and were much more frequent than in the mother.

On the morning of the 6th June the patient stated that during the preceding night she had experienced pains in the lumbar region. On the night of the 6th she continued to feel pains in the loins, and slighter ones in the uterus. At half-past four on the morning of the 7th, the pains increased somewhat, and the waters came away by the vagina. The tumor then became considèrably diminished in volume; which induced Ladesma to attempt reduction, so that if possible the child might be delivered by the natural passages. The endeavors were unsuccessful. Under these circumstances, it was determined to resort to hysterotomy; which was accordingly performed at half-past twelve o'clock in the presence of fourteen medical gentlemen. The patient lay in bed upon her back; the tumor, which was formerly thirty-two inches in circumference, was only twenty-eight since the discharge of the liquor amnii. Being satisfied by auscultation that the placenta was situate about the middle and on the left side of the tumor, the operator chose that place for his incision. The first cut divided the integuments and peritoneum,

leaving bare the womb; and it having been ascertained that neither the ovary nor the Fallopian tube were in the way of the knife, the incision was cautiously continued into the interior of the uterus. A copious hemorrhage followed. At the inferior extremity of the wound was seen, under the margin of the placenta, the child, with its legs doubled up towards its belly, the head touching that portion of the uterus at the inguinal ring, and the breech at the bottom of the womb with the back upwards. Without a moment's loss of time, the extraction of the child was commenced by the feet; but the removal was not completed without enlarging the wound, for when the trunk came out the uterus contracted so powerfully as to threaten the child with suffocation. The child was a healthy female, weighing 6½ lbs., and measuring twenty-two inches in length. It was at first asphyxiated, but soon gave signs of life; and was solemnly baptized by the parish priest in the evening. The mother bore the operation with serenity and heroism, though she was much weakened by the hemorrhage: she had convulsions and cold sweats, with a low and irregular pulse, but was relieved by strong beef-tea and an antispasmodic mixture.

The subsequent history of the case is minutely reported, but a few words will suffice for the important details. Light cataplasms of mallows and hemlock leaves were applied to the womb, the edges of which were kept in apposition by a bandage. The suppuration was at one time profuse; and the patient suffered from inflammation of the uterus and peritoneum. On the 12th June the lochial discharge flowed from the vagina. On the 12th July she menstruated; and on the 11th August she walked out with her infant, both being in perfect health. The tumor remained small, not exceeding in size an ordinary scrotum; and it formed a hysterocele in the inguinal ring to which it was attached by adhesions.

The foregoing narrative concludes all that I have to say on the subject of hernia of the gravid uterus. The treatment required in this class of cases is obvious. The ordinary principles of obstetric surgery will be found applicable here as they are in those cases where, from disease or some congenital malformation, delivery of the fœtus by the natural passages is rendered impossible.

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