

**An introduction to the practice of midwifery. / by Thomas Denman, M.D.
Licentiate in midwifery of the College of Physicians. Volume the first.**

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AN
INTRODUCTION
TO THE
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OF
MIDWIFERY.

By THOMAS DENMAN, M.D.

LICENTIATE IN MIDWIFERY OF THE COLLEGE OF PHYSICIANS.

VOLUME THE FIRST.

LONDON:

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TO

Dr. WILLIAM OSBORN.

DEAR SIR,

I beg you will accept this First Volume of my Introduction to the Practice of Midwifery, as a Proof of the very affectionate regard I have ever entertained for you ; which, as it began with our first studies, may, I earnestly wish, remain uninterrupted to the end of our lives. I am,

DEAR SIR,

Your very faithful,

Affectionate, and most humble Servant,

THO. DENMAN.

LONDON,
NOV. 1, 1788.

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P R E F A C E.

MANY of these papers, which are now collected into one volume, have been before printed, and of several of them there has been more than one impression. By this mode of publication I have had an opportunity of correcting many errors; though, with all that I have been able to do for the amendment of the work in general, I am yet very sensible of its imperfections. But the reader will discover that pains have been taken to render it less unworthy of his regard; and the hope of being useful to those who are engaged in studies of this kind has converted the trouble into pleasure. It is my intention to proceed in the same method with the second volume, many parts of which have been already printed, and that will include all which I have to say on the subject.

Of the medical treatment of the diseases of women, of the practice of midwifery in particular, we have no accounts from the earliest

writers but such as are very imperfect, and involved in works which the life of one man would scarcely be sufficient to glean; and, after all his labour, his curiosity might be gratified, but he probably would not gain or give much satisfaction. The cultivation of medicine at large, of that branch of which we are about to treat in particular, is of a late date in this country; which, to one glance of the eye, exhibits a view of the steps by which human beings emerge from a state of absolute ignorance and barbarism, become civilized, and arrive at eminence in every art and science.

In what country medical knowledge was first cultivated and reduced into scientific order, cannot now be traced; for, beyond a certain time, the records are crowded with fable, and, being only supported by conjecture, are not entitled to our confidence. But, long before the establishment of systems, there must have been a time, when means were used for the cure of diseases and the relief of accidents. There must also have been a time when the rude but well-meant endeavours of one friend to relieve another in distress ceased, and application was made to those who were supposed to have more information or greater skill; and this would properly be the
origin

origin of the art. By what steps or means the Greeks became sooner and better informed, in all arts and sciences, than other nations, we cannot now decide; whether it depended upon the force of their own native genius, or whether this knowledge was communicated by some preceding or neighbouring people. It is probable that the Greeks were informed by the Egyptians; but, by whatever means they acquired their information, to the Greeks the distinguished glory is due of having conveyed, in their own language, the rudiments not only of medicine, but of every art and science, to all the western world. The very name of Hippocrates has filled with enthusiasm every succeeding writer; and all those of whom we have been accustomed to think with veneration, or to speak with respect, have mentioned him with admiration, and held him to our view as an example to be imitated, or as a pattern to be followed. Whether we consider his writings with regard to the morality which they inculcate, the liberal conduct which they recommend, the strong and the extensive observations with which they abound, or the order and method in which these are conveyed, it is not possible to withhold our esteem. He had also the good fortune of writing

in a language which was not only known, but spoken with purity for a longer time than any other; for Hippocrates lived near five hundred years before the Christian era, and the Grecian was the popular language at Constantinople, even at the time when this city was taken by Mahomet in the fifteenth century. The Greeks also maintained their superiority in literature and arts for a long time after their political sovereignty was lost. But if there be any progressive power in the human mind, if there be any advantage obtained in the practice of medicine, by the knowledge of the circulation of the blood, or of a more correct anatomy and physiology at large, by the application of chemistry, by a more copious materia medica, by the records of experience, or by many collateral arts which medicine calls in to its aid, we may be allowed to say, that Hippocrates ought not to be considered as the guide of Physicians at the present time, or as having limited either the perfection or extent of the art; but as an illustrious specimen of ancient medical knowledge and practice. And if this observation holds good with respect to Hippocrates, it will have more force when applied to all his transcribers and commentators. To the Greeks we are indebted for the works of

Aristotle in the time of Alexander the Great; and, when they were subdued by the Romans, the first object of their conquerors was, to acquire possession of their knowledge. With other arts and sciences, the Greeks are to be considered as the instructors of the Romans in medicine; and, allowing for some change in the arrangement, the addition of what he had collected from other writers, a few improvements in surgery, and the local application of principles before known, Celsus, who lived at Rome in the first century, may be considered as the transcriber of Hippocrates.

The flourishing state of the Romans was of short duration. The empire was divided into the eastern and western in the fourth century. Rome, which was the capital of the latter, was taken by Odoacer, king of the Heruli, under whose subjection it remained; and the Romans ceased to speak the Latin language in the beginning of the seventh century. But neither the conquest of Rome by Odoacer, nor that of Alexandria under the Caliph Omar, nor the permanent subjection of Constantinople by Mahomet the second, in the fifteenth century, extinguished that knowledge, and those arts, which had been so long and so strenuously cultivated and exercised.

exercised. From the destruction of the library at Alexandria were produced the schools of Antioch and Haran, or what may be called the Arabian schools, the principal medical writers of which were Rhazes, Avicenna, Avenzoar, and Albucasis. The sentiments and manners of no people could be less favourable to learning than those of the Arabians; and we accordingly find in every history that, when they spoiled Alexandria, their intention was to destroy all kinds of science, by burning the magnificent libraries which had been there collected; and every book which escaped the general havock was preserved by the care or partiality of private men. The writings of the Arabian physicians were chiefly transcribed from the Greeks; except that an account of the small-pox, and of a few other diseases of less consequence, was first given by the Arabians; and that Avicenna was the first who described the forceps, an instrument contrived for the purpose of delivering women in cases of difficulty, preserving at the same time the life of the child.

After the destruction of the library at Alexandria, the Grecian manuscripts, which were preserved, were also translated into the Syriac, Persian,

Perſian, and Indian languages; and the learned were diſperſed in different countries. For it appears that in the year 767 Almanzur, the founder and Caliph of Bagdat, ſent for a ſkilful and learned phyſician from India; which I mention, becauſe it explains an obſervation made by the Raja of Kiſhenagur, and reported by the learned Mr. Halhed, in the preface to his Perſian Grammar, without any violence to other chronologies. Thus wars and apparent deſtruction became, in the hands of Providence, a means of diffuſing learning over many countries which might otherwiſe have remained in ignorance.

But the firſt ſchools from which the weſtern part of Europe derived their knowledge were eſtabliſhed in Italy in the eighth century; and the moſt famous of thoſe in which the art of medicine was taught were at Padua, where all who aimed at excellence reſorted with the view of purſuing their ſtudies, or of qualifying themſelves for practice. From the contiguity of the two countries, from the frequent wars carried on between France and Italy, or from other cauſes, the French acquired knowledge; ſchools were eſtabliſhed, encouragement was given to learning, many able men aroſe; and France, by
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its more convenient situation to Britain and the northern nations, in their esteem, succeeded Italy in literary reputation; and Paris and Montpellier were the places to which students resorted for instruction, even down to the beginning of this century.

ABOUT fifty years before the birth of Christ, Julius Cæsar made a descent from Gaul into Britain, a country then but little known, the inhabitants of which were in a very uncivilized state; perhaps not one degree more enlightened than the Indians, whom their posterity afterwards discovered in America. The Romans continued long enough in Britain to humble the ferocious spirit of the natives, to prepare them for civilization, and to teach some of those arts by which the evils of their state might be lessened, and some of the comforts of life acquired. On the retreat of the Romans from the island, such of the natives as had been driven to the distant parts poured with irresistible fury on those who had been subjected to the dominion of Rome, and the Saxons were called in to assist and to protect them. Subjection is usually the lot of those who receive political protection; the Saxons assumed the government

ment of Britain, and being but little more civilised than those they came to defend, could afford few opportunities of improvement; and the Danes, in their subsequent invasions, reduced the small advancement which the Britons had made towards learning, notwithstanding the encouragement afforded by Alfred, about the year 900. The Norman conquest took place in 1066, and the change, with all its disadvantages, was productive of some general good to the nation; but the great prospect of literary improvement arose towards the conclusion of the twelfth century, when Richard the First undertook his crusade to the Holy Land. But it appears that there was not a single man in his whole army who understood the Grecian or Syrian languages; so that without any advantage to balance the loss of his subjects or the expenditure of his wealth, he and his people returned to England as ignorant as they departed. During all this barren and dreary time, that is, for the space of nearly thirteen hundred years, the excellence of the Britons seems to have been in the strength of their arms, mention being scarce made of any man who had a claim to be considered as learned in any science, before Roger Bacon, who lived in the thirteenth century.

He was a man endowed with a very superior genius, who, among other branches of philosophy, applied himself to chemistry, which he carried to a higher degree of perfection than his predecessors of any age or nation. A few other names of medical men are recorded, as Richardus Anglicus, Nicholas de Ferneham, Johannes de Sancto Ægidio or Giles, Hugh of Evesham, and Gilbertus Anglicus; but John a Gaddeſden was the first Englishman, according to Dr. Friend, who acquired sufficient reputation to be appointed Physician to the Court, which Gaddeſden was, in the reign of Edward the Second. His work, which he called the “*Rosa Anglicana*,” was never printed in England: and if it is compared with those of the Greeks, and perhaps of some other physicians of his time, he may deserve the severity of that censure which has been unsparingly passed upon him. But surely much allowance is to be made, and some honour must be given, to the first man in any country, who, by distinguishing himself, was preferred to a place of such high trust and importance. About the same time lived John Ardern, a Surgeon of great reputation at Newarke in Nottinghamshire, who composed*

* See Aikin's Biographical Memoirs.

many works, none of which have been printed, except a treatise on the "*Fistula in Ano.*"

Knowledge must be introduced into every country in some one or more of these ways; it must be gained by the genius and industry of the natives; by communication with other nations in which it already exists; or the rudiments must be acquired in some other nation, and then carried to greater perfection by the genius and industry of those, who originally received their instruction from foreigners. If knowledge was conveyed from the Babylonians to the Egyptians, those would probably afford an example of the first; the Greeks of the second; and all Europe would be an example of the third. But the progress of knowledge would be exceedingly slow, in the beginning, in every nation; and even supposing the powers of the mind were not diverted from the pursuit by more favoured objects, it would be long before men thus circumstanced could be put into competition with a people already informed. The abilities of particular men would very often be lost by their death; and, if they were disposed to convey their knowledge by writing, the number of copies would be comparatively few, full of the errors of the transcribers, and difficult to be understood, from

the changes in the meaning of words, and the construction of the language in which they might be written. Nor would a people deserve the name of skilful and learned, because there were a few men of distinguished abilities among them, but because the generality were so well informed as to be able to execute with aptitude what was required of them for the good of society.

*All or the greater part of the impediments to the acquisition or diffusion of knowledge in general, were happily removed in the fifteenth century by the discovery of the art of printing, by John Faust or Fust, a German, about the year 1432. This art was introduced into Britain in the year 1470, by William Caxton, who hired himself as a servant at Cologne, for the purpose of qualifying himself as a working printer. There are two books, it is said, which were printed by him before his return, of one of which we shall have occasion to take notice. Another event extremely favourable to the improvement of medicine took place early in the next century, that is, in the year 1518; which was the establishment of the College of Physicians in London, by the charter of King Henry the Eighth. The words of the charter of the college denote its view; Improborum
hominum*

hominum qui medicinam, &c.; audaciam compescere; *and the kind of institution, institutarum civitatum in Italia exemplum imitati; and the persons to whom it was granted, gravium virorum doctorum, &c.; precibus inclinati.* For certain purposes, promoting the good of society, these men were directed to form a college, which must signify their selection; with powers for their internal regulation, as forcible as those ever granted to any other university or college; provided such regulations only were executed as promoted those interests of society which were committed to their trust. And I mention these circumstances because the selecting power of the Fellows of this college, though allowed to all others, has been disputed by some good men; who perhaps did not recollect that, before the establishment of the college, the art of medicine was practised without restraint, in this country, by men as bold as they were ignorant; nor foresee that, if it was annulled, the art would, in all probability, decline into its primitive state of ignorance and confusion. It would moreover be easily proved, that since the year 1484 there have been at all times physicians of distinguished abilities and eminence, and that the general literature of this country has been in many instances very effectually assisted by this college.

One of the first books printed by Caxton was “*Bartholomei de Proprietatibus Rerum.*” He is mentioned by Dr. Friend as B. Glanvillus, which is an error, for the title of the copy of the book which I have seen, probably Caxton’s, is this—“*Incipit probemium de Proprietatibus rerum Fratris Bartholomei, anglici, de Ordine Fratrum Minorum.*” This is in the nature of a Cyclopædia; and being a book not much known, I allow myself the liberty of making an extract from it, which will shew the nature of the work. His observations on fire, which will exhibit his philosophy, are in this order—De forma—De elemento—De igne—De flamma De fumo—De carbone—De scintilla—De favilla—De cinere.—The following from his chapter de infirmitatibus will shew his medicine.—De febre—De febre effymera—De ethica—De febre putrida—De signis putridæ febris—De febre cotidiana—De febre terciana et ejus signis et cura—De quartana et ejus signis et remediis—De febre simplici et composita. He has a chapter de obstetrice, and another de umbilico, but they both relate almost wholly to the management of the child. A book like this promised to be of great service; but, though the circle was large and regular, it was

was filled, not with the observations of a man of real knowledge or experience, but with popular opinions, and those collected, without much discrimination, from other writers. A translation of this work, by John Trevisa, was printed by Wynkin de Worde in 1507, another edition by Berthelet in 1535, and I believe some others. Very few medical books seem to have been printed about this time; and, from the examples, their loss is not to be regarded. The “*Judycyall of Vryns*” was printed in 1512; “*A litel Boke for the Infirmites and grete Sickenesse called Pestilence*,” which passed through many editions; and “*A little Treatyse called the Gouvernail of Helthe*.”—But in the year 1522 Linacre published a translation of different parts of Galen, which he thought most useful to be known. The ability with which these translations were made is universally acknowledged, and great honour was justly given to Linacre on the occasion. But the English practitioner did not reap much advantage from the work; for though there might not have been six men in the nation at that time able to read or translate Greek, and probably some hundreds who understood Latin, yet the bulk of the people were strangers to both the languages; and of this Linaere himself seems to have been sensible; for
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he immediately afterward published his “ Rudimenta Grammatica Linguae Latinae.” Nor can I here help lamenting two defects in Linacre’s plan; one, when the college was established, that he did not encourage the publication of papers on medicine, under the auspices of the college; a defect seen by the establishers of the Royal Society, who published such papers in their transactions, a place by no means proper for them; the other, that he did not publish his works in English, when they would have been generally read, have stood as good examples, and taught a proper method of writing. It was not done, and the English medical writers returned to their former style; and for many years little real progress in knowledge was made, nor any titles heard of but those of Urynals, Judgment of Urynes, Anatomies of Urynes, Trefuries of Helth, Mirrours of Helth, Anthidotaries, Breuiaries of Helth, the Trefures of poore Men, Herbals, and the like, by medycyners and astronomers. But about the year 1540 some attempts were made to translate books of reputation into the English language; as Sir Ulrich Hutten on the wood called Guaiacum that healeth the Frenche Pockes, by Paynell, Canon of Marten Abbey, who also translated
many

many other books about 1533; the Castell of Helthe by Sir Tho. Elyot, who was not a physician; Albertus Magnus; Prognostications out of the books of Ypocras, Auicen, &c. and the Questionarie of Cyrurgyens, with the formularie of Iytell Guydo in Cyrurgie. In the year 1540 was also published the first book on the subject of midwifery in England, called "The Byrth of Mankynde," otherwise named "The Womans Booke," by Thomas Raynold, Physician; the second edition of which was imprinted at London by Thomas Ray, whose name is not mentioned either by Ames or Herbert, in their history of printers. This was also the first book which has prints; and, as every one of these books went through several editions, we may conclude they were in high estimation. Then (1545) came forth also an abridgment of Vesalius under the title of, "Compendium totius Anatomiae delineatio ære Exarata, per Thomam Geminum, Londini." Geminie was an engraver.

But one of the first English medical books, properly speaking, I take to be "a short and profitable treatyse touchinge the cure of the disease called Morbus Gallicus; withe an account of the nature of Quicksilver, by G. Baker, Maister of Chirurgerie, 1579," and the first book in
c surgery,

surgery, called, “*An Excellent Treatysse of Wounds made with Gunshot, &c.*; by Thomas Gale, Maister in Chirurgerie, (1563.)” The dedication to Ambrose Parè’s work is dated Feb. 8, 1579, and it was translated into English in 1634 by Thomas Johnson; so that it may be doubted whether Gale did not precede Parè in the recommendation of a more simple method of treating gunshot wounds. The same Tho. Gale also printed, “*An Encherridion of Chirurgerie,*” and many other works relating both to surgery and medicine together with the “*Institution of a chirurgeon.*” Gale was a very meritorious indefatigable surgeon. Near the same time John Halle published what he calls the “*Chirurgia Parva Lanfranci;*” and John Bannister “*a Treatysse of Chirurgerie;*” and soon afterwards William Clowes “*A briefe and necessarie treatysse touchynge the cure of the dys-ease called Morbus Gallicus, or Lues Venerea, by unctions and other approved waies of curing.*” But there had also been published, in the year 1577, a profytable treatysse of the anatomie of man’s bodie, compyled by that excellent chirurgeon, M. Thomas Vicary, Esq. Sarjaunt Chirurgeon to Edward the Sixth, Queene Marie, and Queene Elizabeth, and also chiefe Surgeon

Surgeon of St. Bartholomew's Hospitall. There was also printed in 1597, "The whole course of Chirurgerie," by Peter Lowe, a Scotchman, Aurelian doctour in the facultie of chirurgerie at Paris. I find a few books published by physicians about this time.—"A short discourse of the most rare and excellent Virtue of Nitre"—"A Greene Forest, or a Natural Historie," by John Mapler, M. A. and student at Cambridge—"The Hammer for the Stone," by Walter Carie; and a briefe treatyse called "Carie's Farewell to Phisicke"—"Stirpium Adversaria Nova perfacilis investigatione luculentaque accessio ad priscorum Materiam Medicam"—"The Benefit off the annient Bathes of Buckstone, and the Bathes of Bathes ayde; by John Jones, Physician"—"Hygeina, &c. authore Timotheo Brighto, Cantabrigiensi Medicinæ Doctore:" and a Treatyse of Melancholie, by the same author; "Praxis Medicinæ Universalis" (1598), and some others, which shew very satisfactorily the pains taken by the English to acquire knowledge by their own industry, and by translating all the works which were then held in particular esteem. But it appears also that the progress made by the English physicians and surgeons, for the improve-

ment of the respective branches of the profession, had not been very rapid, and that much remained to be done at the commencement of the seventeenth century; and particularly that the practice of midwifery had not been yet attended to, unless as a part of surgery.

In the year 1560, Francis Bacon, afterwards Lord Verulam, was born, a man whose fame will receive no addition from any applause which it is in my power to give. He was a meteor from whose lustre all nature received some light; and, though he did not apply himself particularly to the study of medicine, he has left many useful observations relating to it; and he promoted this, and almost every other branch of knowledge, by teaching and practising the most effectual method of acquiring it.

*In the year 1578 William Harvey was born at Folkston in Kent; and, having completed his studies at Cambridge, he went to Padua, where he was admitted to the degree of Doctor, in unusual and flattering terms of approbation, in 1602. In the year 1615 he was appointed by the College of Physicians to read the lectures on anatomy and surgery; and in these he first promulgated his discovery of the circulation of the blood, a discovery so complete, that no person has ever controverted one position, or amended his
expla-*

*explanation. With all the sagacity and perseverance of a truly great man, he applied himself to form an entire history of the generation of animals, with that of the preceding and accompanying changes; but his studies were interrupted, and many of his papers lost, in the time of the civil war. It does not appear that he had determined to publish the rest, though finished with admirable correctness, till he was prevailed upon by the solicitations of his intimate friend Sir George Ent, who supervised the printing of them, in English, in the year 1653; but I have no other authority for this fact than the preface to that edition. By inclination, or the necessity of his affairs, Harvey was engaged in the Practice of Midwifery, by which means he got that information which enabled him to write his “*Exercitatio de partu*,” and many excellent observations with which his works abound. He clearly entertained an opinion that the knowledge of the circulation, the constituent parts, and properties of the blood, would enable physicians to cure all diseases. The discoveries which Harvey made, the many subjects which he illustrated, and the delicacy and patience which he exercised in his investigations, then unknown in this country, entitle him to the*
highest

highest honour as an anatomist, and as a man of science. He died at eighty years of age, honoured and beloved for the greatness of his abilities, the ingenuousness of his disposition, and the mildness of his manners.

*From the gradual progress of science, or from the example of the two illustrious men last mentioned, a happier prospect dawned upon Britain, to which I must beg leave to call your particular attention.**

Thomas Sydenham was born in the year 1624, and graduated at Oxford. He applied himself to the practice of medicine, and wrote his account of the continued fever of the years 1661, and three following years; which fever he then supposed to be the only one in nature. But further experience convinced him that there were many kinds of fever, and of these he has given an account to the year 1683—together with dissertations on the small-pox, hysteric diseases, dropsy, gout, and many sporadic diseases. Some notice is also taken of the diseases incident to women in childbed, and of many of the complaints of children. His works were published at different times as the occasions occurred to him.

** The greater part of this Preface was given as an Introductory Lecture.*

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The writings of Sydenham, whether we consider the sagacity and order with which the observations are made, or the fidelity with which they are recorded, have been held by all succeeding physicians in the highest esteem; and, from the time of Hippocrates to the present, he has been deservedly considered as the best example of a practical physician; though it must be acknowledged that he was often wrong in his theory, and in some instances in his practice; but his descriptions of diseases are allowed to be excellent. He died in the year 1689.

Francis Glisson was educated at Cambridge, where he became Regius Professor. He was one of the physicians to Queen Elizabeth, and to James the first. In 1654 he published his "*Anatome Hepatis*," in the internal structure of which viscus he made several new observations; in 1659, his "*Tractatus de Rachitide*," which disease he was the first who described; and after some years his book "*De Ventriculo & Intestinis*," in which he first took notice of the irritability of the simple fibre; so that he has an undoubted right to the credit of being the father of all the doctrine of irritability, since unjustly attributed to Haller, and on which so many volumes have been written without the
7 mention

mention of Glisson's name. He also published another work "*De Naturæ Vita,*" of which I have never seen a copy. Glisson lived to be upwards of one hundred years of age*.

Thomas Willis, Sedleian Professor at Oxford, was born in the year 1621, and published, as the foundation of a large design, his "*Cerebri Anatome, cui accessit Nervorum Descriptio & Usus,*" in 1663. In this work he was much assisted by Dr. Lower, and the drawings were taken by Christopher Wren. The terms in which Willis speaks of Lower seem descriptive of both their characters—*cujus cultelli & ingenii aciem, lubens agnosco—emicuit viri solertia plane admiranda, necnon indefatigabilis industria, nulloque óbice sistendus labor.* In 1672 he published his work "*De Anima Brutorum,*" which is to be considered as a sequel to the former. It is a work of infinite labour, reflection, and ingenuity, in which he describes the causes and effects of those diseases arising from nervous influence. There are in this book four plates, three extremely fine, representing a dissected oyster, a lobster, and an earthworm.—In 1673 he pub-

* See the General Biographical Dictionary; or the Annual Register for the year 1767.

lished

lished his "*Pharmacentice Rationalis, sive Dia-
triba de Medicamentorum Operationibus in
Humano Corpore,*" a work composed of anatomi-
cal, physiological, and practical observations,
with many curious plates of the lymphatics, vasa
vasorum, and other finer parts of anatomy. He
died before the second part of this was printed; and
in the preface to it there is a short account of his
life and writings. The works of Willis are very
numerous and useful, and bear indubitable marks
of great learning, genius, and industry, but
they are seldom studied. Perhaps his medical
works may be too philosophical for practical
physicians; and his philosophical works too much
blended with medicine to please philosophers; but
there is scarcely a subject relative to either on
which light has not been thrown by Dr. Willis:
for though he was very much engaged and emi-
nent in practice, he constantly pursued the im-
provement of his profession. He died in the year
1675. The practical works of Willis were
badly translated into English in 1685, and all
his writings afterward, in a language never very
good, and now become obsolete.

Nathaniel Highmore wrote his "*Disquisi-
tiones Anatomicæ,*" in 1651, and "*A His-
tory of the Generation of Plants and Animals,*"

in which it appears that he made many discoveries, particularly of the antrum in the upper jaw; to which his name has ever since been given.

Contemporary with these was Walter Needham, educated at Cambridge, but who afterwards resided at Shrewsbury. He wrote "*Disquisitio Anatomica de Formato Fœtu*," a work of deservedly high estimation, in which he takes the opportunity of treating not only upon the contents and economy of the gravid uterus, but upon the lacteals and lymphatic system, and many other anatomical subjects.

In the year 1656 Thomas Wharton published his "*Adenographia*," a work of established reputation, in which, among other things, he has observed many things which relate to the gravid uterus.

Nathaniel Henshaw published his "*Aero-Chalinos*" in the year 1677. This contains the five following tracts:—"On Fermentation
 " —Chylification—Respiration—Sanguification
 " —The good effects of changing Air."

About the same time lived Walter Charlton, who published "*Onomasticon Zoicum*" in the year 1668, and in the following year his "*Economia Animalis*," of which Sir George

Ent

Ent gave this character—opus maturo consilio inchoatum, magna cura elaboratum, ingenio denique et doctrina singulari perfectum. Charlton also published several other works, particularly “*De causis Catameniorum et Uteri Rheumatismo.*”

In 1668 Dr. Mayow of Oxford published his work “*De Respiratione—de spiritu nitro—
“ aereo—de fermento ventriculi—de succo uteri,
“ nutritione foetus, usu aeris in ovo;*” and in which also he treats on many other interesting and curious subjects.

Dr. Richard Lower, before mentioned in the account of Willis, in 1676 published his “*Tractatus de Corde, item de motu et colore sanguinis, et chyli in eum transitu.*”

This celebrated work has many observations on the lymphatics, and the receptaculum chyli, which he considers as their general centre, as early as Pecquet. He also made many curious anatomical and physiological experiments, and in this work asserts his claim as the inventor of the art of transfusing blood.

The Chirurgical Treatises of Richard Wiseman were dated in 1676. These are allowed to have very great merit: and Wiseman may, not unjustly perhaps, be considered as the first

English surgeon—"The Comes Chirurgorum," containing Dr. Read's Lectures, was printed in 1686.

Dr. Nehemiah Grew published separately, though they were afterwards collected into one volume, his "*Anatomy of Plants*," in which there are many observations respecting the solutions of salts; his "*Anatomy of Roots—Comparative Anatomy of Trunks*," between the years 1670 and 1680—"Cosmologia Sacra," and several other works.

At the same time lived John Ray, the celebrated Botanist.

Clopton Havers published his "*Osteologia Nova*," in 1690.

In this work he described the mucous glands of the joints, which he discovered, and the internal structure and diseases of the bones, cartilages, &c.

In the year 1695 Ridley published his "*Anatomy of the Brain*," of which he discovered the lymphatic vessels; and his "*Observations*," in which he treats on several abstruse parts of anatomy.

Dr. Richard Morton published his "*Phthiologia*" in 1689; his "*Pyretologia seu de morbis acutis Universalibus*" in 1691; and his work "*De febribus Inflammatoriis*" in 1694.

Sydenham's

Sydenham's treatment of Fevers was almost universally antiphlogistic; Morton's, on the contrary was cordial and sudorific; but we have between these two writers all the arguments which have been advanced in favour of either treatment.

The first edition of Cowper's "*Myotomia Reformata*" was published in 1695; and Keil's *Anatomy* in 1698.

By the writings of these very eminent men, and of many others whom I might have named, particularly of the celebrated Robert Boyle, it appears that the physicians of this country were indefatigable in the acquisition and improvement of science; that they were not only acquainted with the general knowledge of the Greeks, Romans, Arabians, Italians, and French, but might fairly be put in competition with those of any other nation, if they did not precede them; and that all the changes we have seen were produced in less than two hundred years, that is from the time when the College of Physicians was established, in the year 1518, to the termination of the seventeenth century.

I must in this place beg leave to make a digression. In the year 1668 Herman Boerhaave was born near Leyden. He was originally designed for the church, but was led by inclination, and the ill state of his own health, to apply himself,

self, when very young, to the study of medicine. He graduated in the year 1693, was chosen Lecturer on the Institutes of Medicine in 1701, and enjoyed all the honours which the university could bestow, or the city of Leyden confer upon him. He raised the reputation of this school of medicine beyond that of any other in Europe. The industry of Boerhaave, in the pursuit of knowledge of every kind, is almost incredible; that of any other man compared with his may be called amusement; the facility with which he communicated this knowledge to others was beyond expression happy; and his whole conduct in every religious, moral, and scientific view, to the highest degree laudable. He was honoured in his life, and his memory is universally respected. His history, which was written by Dr. Samuel Johnson, must ever remain a most useful study to medical men, and an example of fine composition. Boerhaave died in the year 1738.

Among the favourite students of Boerhaave was Alexander Monro, who in the year 1719 returned from Leyden to Edinburgh, a city at that time not distinguished by any eminence in medicine. But in the following year Dr. Monro being chosen Professor of Anatomy and Surgery, and Dr. Alston of Botany, they began to give
Lectures,

Lectures, and by their abilities soon acquired that high reputation which enabled them to establish a school of medicine, which they had the very great satisfaction of raising to an equal degree of honour with that of any preceding or present time. Dr. Monro died in the year 1767, leaving behind him many valuable works. By this establishment, the further advantage was gained to Britain of having a succession of very able men, who dedicated the chief part of their time to the acquisition and improvement of medical science, and to the instruction of those who were intended for the profession.

Here I shall conclude these general observations, and confine myself to such only as relate to the practice of midwifery.

The “*Byrth of Mankynd, or the Woman’s Book,*” with sketches not badly intended or engraved, was printed in the year 1540: and as it went through many editions, and as I find no other book of equal value published about that time, I consider it as having been the popular book for near one hundred years; that is, till the year 1634, when all the works of Ambrose Parè were translated in one volume. Parè was a man of much experience, some erudition, and not a little credulity, but he made many useful observations

observations relative to midwifery. In the year 1653 Harvey's Exercitations were published in English, but whether translated or original I cannot decide. About the same time also lived Dr. Chamberlen, a very celebrated physician, who applied himself to this branch of the profession. He had three sons, who, with their father, were supposed to have a better method of relieving women in cases of difficult parturition than any other person, by means of an instrument said to be the forceps, but which I believe to have been a vectis. One of the sons went over to Paris with a view of selling the secret, or of making a fortune by practice; but being foiled in the first case to which he was called, and suffering more obloquy than he deserved, he returned to England, and immediately published a translation of Mauriceau's work, which remained for many years in very high esteem. This was in the year 1672.

Having been favoured by Dr. Kirkland with a manuscript written by Dr. Percival Willughby, who lived at Derby, and afterwards in London, I am able to give the reader a just idea of the practice of that time, many of the cases being dated from 1640 to 1670. This work is entirely practical, and was intended to be published

lished for the use of midwives, there being a title page, and two copies with variations.

His preface is in this manner:

“ I haue read many bookes, with all the
“ late writers in midwifery, and I do perceiue
“ that they all followe one common roade, tak-
“ ing their seuerall scheemes and figures one from
“ another.

“ In seuerall of these scheemes uarious things
“ may be perceiued which will be trublesome to
“ the labouring woman, which a judicious
“ practitioner will not followe. Let midwiues
“ mark whatt hath been written in my obser-
“ uations, let them consider diligently the seue-
“ rall reportes not faigned, or the surmised
“ thoughtes, nuectors, or man’s fantasie, sitting
“ and meditating in his studye, but which really
“ haue been performed in the trauailing wo-
“ man’s chambre.

“ From mine and their directions let mid-
“ wiues choose the best and facilest waies of re-
“ lieuing women in affliction, and to decide all
“ disputes, let reason be the judge, let experience
“ argue the dubious points of practice; and, after
“ a full debate, let unspotted truth recorde
“ to succeedinge times what is most fitt to be
“ followed and used, &c.”

*This is a specimen of his illustration. “ Let
 “ midwiues obserue the waies and proceedinges
 “ of nature for the production of her fruit on
 “ trees, or the ripening of walnutts and al-
 “ mondes, from theire first knotting to the open-
 “ ing of the huskes and falling of the nutt; the
 “ green huskes sticking so close that it is not
 “ possible to separate the huske from the shell,
 “ whilest it is unripe; but as the fruite ripeneth
 “ the huske choppeth and with a fissure openeth,
 “ and by degrees separateth the fruite without
 “ any enforcement.*

*“ An egge representeth the wombe: now the
 “ henne with keeping the egge warme doth
 “ breed the chicken, which when it comes to
 “ maturitie doth chip the shell, and is by degrees
 “ hatched without injurie. These signatures
 “ may teach midwiues patience, and persuade
 “ them to let nature alone to performe her owne
 “ worke, and not to disquiet women by their
 “ strugglings, for such enforcements rather hin-
 “ der the birthe than any waie promote it, and
 “ oft ruinate the mother and usually the childe;
 “ and let midwiues knowe that they bee natures
 “ seruantes, &c.” Willughby’s practice is
 very little different from that of the present time.
 He divide labours into two kinds only, natural
 and*

and unnatural. The particular rules I cannot pretend to describe in this place; but the following letter, quoted from a scarce work, corresponds so exactly with an observation it was my fortune to make, some years before I saw this manuscript, that it cannot displease:

“ Referam hoc casu, quid beatæ meæ conjugī
 “ acciderit. Tertio fœtu gravidam, nono præg-
 “ nationis mense, labores parturientium arripi-
 “ unt, circa noctem. Mox rupta aqua (ut hic
 “ mulieres loqui amant) extra genitale, infan-
 “ tuli manus propendit. Ubi obstetrix adve-
 “ nisset, uxorem meam in sedili collocavit, eam-
 “ que ad continuos conatus (me nolente nec in-
 “ stigante natura) adegit. Cum vero res eo
 “ modo non succederet, meamque conjugem su-
 “ pra sedem continuo detineret, ac diris crucia-
 “ tibus illapsum ex uteri cervice manum brachi-
 “ umque retrudere niteretur, quo fœtum ad ex-
 “ itum commodius disponderet. Ego præ dolore
 “ charæ meæ conjugis impatiens, ac indefinen-
 “ ter obstetricem admonens, ne quidem elapsi
 “ membri reductionem in uterum cogitaret possi-
 “ bile, multo minus moliretur, secundam obste-
 “ tricem accersiri jussi, præsertim cum uxor
 “ mihi nunciaret, quod obstetrix eam dilacera-
 “ ret per illam præconceptam ac miseram elapsi
 “ membri

“ *membri repulsionem. Cum insequenti die,*
 “ *manè, obstetrix altera venisset, illa manus ad*
 “ *opus applicans remque diligenter explorans,*
 “ *uxorem meam in lectum deposuit, mandavit-*
 “ *que ut se quietam detineret, nullosque conatus*
 “ *excitaret, nisi quando natura eam sui admo-*
 “ *neret officii.*

“ *Interim obstetrix illa prudens et expertissima*
 “ *prædixit mihi amicisque præsentibus, uxorem*
 “ *meam non ante parturam, quam fœtus in*
 “ *utero, ex indebito situ, conatibus strangula-*
 “ *retur, quod eventus docuit. Multiplicati sunt*
 “ *labores parturientis, et fœtus, inflexo ad dor-*
 “ *sum capite, (salva matre) prodiit in lucem*.”*

This Dr. Willughby was one of the six sons of Sir Percival Willughby, and grandson of Sir Francis, so famous in the time of Queen Elizabeth.

It is probable that the fortune and eminence acquired by the Chamberlens might be the occasion that many gentlemen engaged in practice, endeavoured to establish themselves upon the same principles; of which class was Dr. Bamber. Others might attempt to gain equal reputation and fortune by the very contrary means, that is

* *Novus exortus hominis et animalium.* ANTON. EVERARD.

by decrying the use of instruments on any occasion; for about the year 1723, Dr. John Maubray published a volume upon this subject called "*The Female Physician, or the Whole Art of New improved Midwifery,*" in which he exclaims with great vehemence against their use. In the following year he also published an appendix under the title of "*Midwifery brought to Perfection,*" in which he demands great credit for the many improvements he had made. This appendix is in truth no more than a Syllabus of his Lectures, a course of which consisted of twenty, twelve anatomical and physiological, and eight practical. I believe it would be unjust to deny to Maubray the credit of having been the first public teacher of Midwifery in Britain. He gave his Lectures at his house in Bond-street.

In the year 1719 Dionis' *Midwifery* was translated into the English language; and in the year 1729 Deventer's work was translated and published, and though it appears that rather more credit has been given to this author than he deserved, as he enters upon a discussion of the causes of many difficulties which occur in practice, and as he was generally averse to the use of instruments, Deventer's work may be esteemed

esteemed a considerable addition to the stock of obstetric knowledge in this country.

Dr. Simson Professor at St. Andrew's, published in 1729 his "System of the Womb," a work of sufficient ingenuity, but not of much use in practice, even if his theory had been true.

About the year 1733 Edmund Chapman published his "Treatise on the Improvement of "Midwifery," in which there are several useful observations; and other writings of temporary consequence only. Chapman was the second public Teacher of Midwifery in London, and he was the first also who described the Forceps in the third volume of the Edinburgh Medical Essays.

In the year 1734 Dr. Hody published a "Collection of Cases in Midwifery," written by Mr. William Giffard. These cases, two hundred and twenty-five in number, seem to be written with great fidelity, and as they occurred in his own practice, they were lessons of the conduct which ought to be pursued in similar cases, and may now be considered as examples of the state of practice at that time. Giffard also gave a plate representing the Forceps and was, I believe, among the first who asserted that the placenta might be attached over the os uteri.

"The

“The Midwife rightly Instructed,” was published in the year 1736 by Thomas Dawke; and the *“Midwife’s Companion* by Henry Bracken, in the following year, with some other things equally unimportant.

About this time lived Richard Manningham, who quitted the profession of Pharmacy and applied himself with great assiduity to the practice of Midwifery. In a pamphlet, published in the year 1730, he is mentioned as having been knighted. In the year 1739 he established a ward or small hospital for the reception of parturient women, which was the first thing of the kind in the British dominions. At this ward he gave lectures, and the students had opportunities of being qualified for practice. He published a *“Compendium artis obstetriciæ;”* a *“Treatise on the Febricula;”* on the *“Use and Abuse of Physick,”* and *Aphorismata Medica;* relating chiefly to the practice of Midwifery. Sir Richard Manningham was a man of much learning and information, eminent and successful in practice, and very humane in the exercise of his art. He died about the year 1750.

Sir Fielding Oulde of Dublin, in the year 1741, published a *“Treatise of Midwifery,”* the most interesting parts of which are his observations on the continuance of the thickness of
of

of the Uterus during pregnancy, and his description of the manner in which the head of a child passes through the pelvis at the time of birth; the truth of which observations have since been fully proved and acknowledged.

Having taken this short and imperfect view of the progress of Midwifery in this country, from 1540 to the year 1740, it will be prudent to conclude. For at that time the English might be said not only to have pursued, but to have been in full possession of the subject; all the books written in the neighbouring countries being translated, public lectures given, and an hospital established for the further improvement of the art: and as all the books printed since that time may be readily procured, every gentleman has an opportunity of forming his own opinion of their respective merits. But the College of Physicians having been pleased, in the year 1783 to form a rank, in which those who dedicate themselves to the practice of Midwifery should be placed, I trust that future accounts will be more correct; and that this measure adopted by the College will promote the public benefit, by confining the industry and abilities of one class of men to this branch of the profession.

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INTRODUCTION
TO THE
PRACTICE OF MIDWIFERY.

CHAPTER I.

SECTION I.

ON THE PELVIS.

THE anatomical and phyfiological knowledge of all the parts concerned in parturition is indifpenfably neceffary for thofe who mean to excel in the practice of midwifery ; even that of the whole body may, on various occafions, be employed with advantage. In the inveftigation of every fubject there muft however be fome point of commencement ; and, as there is much ufe and propriety in the method hitherto purfued by fyftematic writers, I fhall follow their example, and give, in the firft place, a description of the fituation, ftructure, connexion, ufe, and difeafes of thefe parts ; beginning with the *pelvis*, which

B is

is of great importance, on account of the direct influence which it has upon labours, and because it may be esteemed the foundation on which all the other parts are sustained.

The term *pelvis* has been indiscriminately given to the inferior part of the cavity of the *abdomen*, and to the bones which form the cavity ; but it appears more eligible to confine the term to the bones, and to call the space between them the cavity of the *pelvis*.

The *pelvis* in the adult state is composed of four bones ; the *sacrum*, the *os coccygis*, and the *ossa innominata*.

The *sacrum* is situated at the posterior and inferior part of the trunk of the body, and serves as a basis for the support of the spine, of which it is an imperfect continuation. Its figure is that of an irregular triangle, with the shortest side placed upwards. The anterior surface is smooth and flat, and has a considerable degree of inflection or curvature, called the hollow of the *sacrum*, by which the cavity of the *pelvis* is much enlarged. To the posterior surface, which is convex and uneven, some of the muscles of the spine and thigh are attached.

In the infantile state, the *sacrum* is composed of five, and in some subjects of six bones, called
false

false *vertebræ*, cemented together by intervening cartilages, which in the adult become bone; leaving little ridges or lines on the anterior surface, indicating the part where they had been separate. These bones diminish in their size as they descend, so that the lowest, which makes the point of the *sacrum*, scarcely maintains the character of one of the *vertebræ*.

The articulation of the upper part of the *sacrum*, with the last of the lumbar *vertebræ*, is similar to that of the *vertebræ* with each other; but, by the manner in which the *sacrum* and *vertebræ* are joined, the latter inclining over the former, an obtuse angle is made, called the great angle of the *sacrum*.

Through the *sacrum* there is a canal for the residence and security of the *medulla spinalis*; but the posterior part of the canal is incomplete below the third bone, a strong ligamentous substance supplying the place of bone. That part of the *medulla* which is contained in the *sacrum* is called the *cauda equina*.

On the anterior part of the *sacrum* there are four pair of holes or perforations, or more, according to the number of bones of which the *sacrum* was originally composed, through which large nerves pass for the use of the parts con-

tained in the *pelvis* and of the inferior extremities. On the posterior part of the *sacrum* there is an equal number of perforations disposed in the same longitudinal order ; but they are less than those on the anterior part, and covered by membranes, which allow small nerves to pass through them.

The *sacrum* is of a very cellular texture, and is said to be lighter than any other human bone of equal magnitude.

The lateral parts of the *sacrum* form a broad unequal surface, by which it is connected with intervening ligamentous cartilages, to another uneven surface at the posterior part of the *ossa innominata*. The inequalities of these surfaces, receiving and being received by each other, contribute very much to the firmness of the union of these bones. An *anchylosis* is not unfrequently formed between the *sacrum* and *ossa innominata*; and sometimes in consequence of their separation an imperfect joint, which very much weakens that part and impairs the manner of walking for the remainder of life.

To the inferior extremity or point of the *sacrum* is subjoined the *os coccygis*, which has by some writers been considered as a distinct bone, and by others as an appendage to the *sacrum* ;
and

and these form, by the manner of their union, an obtuse angle, called the little angle of the *sacrum*. In infancy the *os coccygis* is cartilaginous, but in adult age it is composed of three, or, more frequently, of four bones, connected by intermediate cartilages, the uppermost of which is somewhat broader than the lower part of the *sacrum*. In some subjects these bones coalesce and form a single bone; and in others an *anchylosis* is formed between the *sacrum* and *os coccygis*; in consequence of which the latter is shortened and turned inwards, so as to obstruct the head of the child in its passage through the *pelvis*. But the impediment thereby occasioned at the time of labour may be overcome by the force with which the head of the child is propelled, and the *os coccygis* again separated from the *sacrum* with a noise loud enough to be distinctly heard, of which I have known more than one instance. In general however, between the bones of which the *os coccygis* is composed, some regressive motion is preserved; and that which is produced between the *sacrum* and *os coccygis*, when the latter is pressed by the head of a child passing through the *pelvis*, occasions a considerable temporary enlargement of the inferior aperture of

the *pelvis**. The insertion of the *coccygæi* muscles, of a part of the *levatoræ ani*, and of portions or slips of the sacrosciatic ligaments into the sides of the *os coccygis*, keep it steady, and prevent any lateral motion.

The *ossa innominata* are the broad large bones which form the forepart and sides of the *pelvis*, and the lower part of the sides of the *abdomen*. In children each of these bones is composed of three; and, though they afterwards become one, the line of original distinction may be observed at the *acetabulum*, or socket, which receives the head of the thigh bone. While the bones are distinct they have peculiar names, the *ilium*, the *ischium*, and *pubis*, which it is necessary to retain in the adult state, that we may be able to describe with more accuracy each individual bone, or allude to it in the description of the adjoining parts.

The *ilium* is the largest and uppermost of the bones which form the *ossa innominata*. It is flat, broad, unequally convex and concave; in some parts round, and in others of an irregular square

* *Os coccygis adeo extrorsum sæpe vertitur ut integros deinde annos conquerantur de dolore, in partibus his residuo.*

Ruyfch. Advers. Dec. 2.

figure.

figure. It is divided by anatomists into the *crista*, *basis*, anterior and posterior edge, and the two sides, external and internal.

The upper part, which has a thick arched border, is called the *crista*. The anterior and middle part of it is convex outwardly, and the posterior somewhat convex inwardly. The *crista* has originally on its verge an *epiphysis*, of which there are often marks to an advanced age.

The *basis* or inferior part of the *ilium* is thick and narrow. It forms anteriorly a portion of the *acetabulum*, or socket, which receives the head of the thigh bone; and posteriorly a large share of the circumference of the *ischiadie sinus*, which is completed by the *ischium* and sacrospinous ligaments.

The anterior edge of the *ilium* has two eminences, called spines, distinguished as superior and inferior, between which there is an excavation or notch, and another below the inferior spine.

The posterior edge is shorter and thicker than the anterior, and terminates with two protuberances or spines, between which there is also an excavation.

The external side of the *ilium* is convex on the fore, and concave on the back, part. The in-

ternal side is irregularly concave ; and upon that surface which is connected with the *sacrum* there are several irregularities. From the upper part of this surface there runs a prominent line, which forms a margin, defining the upper aperture of the *pelvis*.

The *ischium* forms the lowest portion of the *ossa innominata*. Its parts are described under the names of body, tuberosity, or obtuse process, and *ramus*.

The body of the *ischium* forms the lowest and largest part of the *acetabulum*, and sends out a small *apophysis*, which projects backwards and inwards, and is called the spine or spinous process of the *ischium*.

The tuberosity or obtuse process is very thick and uneven, and is turned downwards. As it is the part on which the body rests when we sit, it hath also been called *os sedentarium*. The convex portion was originally an *epiphysis* ; and, from the remains of the tendons and ligaments which were affixed to it has, in the fresh subject, a cartilaginous appearance.

The *ramus* is a flat thin process or *apophysis*, proceeding from the curvature of the tuberosity, ascending and joining to a similar but shorter process, which springs from the anterior and inferior

inferior part of the *ossa pubis*. The *ramus* of the *ischium*, aided by this short process, forms a large part of the outline of that opening called the *foramen magnum ischii*. This opening, in the recent subject, is filled up by a strong ligamentous membrane, which gives rise to the external and internal muscles called *obturatores*.

The *ossa pubis* contribute the smallest share towards the formation of the *ossa innominata*. Each of them has been described in three parts, the body, the angle, and the *ramus*.

The body is that part which is placed transversely before the anterior part of the *ilium*, to which it is united, forming by this union the oblique eminence, which distinguishes on the inner part of the *pelvis* these two portions of the *ossa innominata*. The body of the *pubis* serves also to the formation of the *acetabulum*. The upper edge has on its inner part an oblique ridge, which is called the *crista*, and is continuous with that of the *ilium* beforementioned, as defining the margin of the *pelvis*.

The anterior part of the *pubis* is called the angle, and constitutes that surface which, being joined to the opposite bone, forms the *symphysis* of the *ossa pubis*. This part of the bone is flat and thin. The *ossa pubis* connected together form

form on the external or inferior side an unequal concavity ; but on the internal or superior surface they are pretty equally convex, and both the edges have a small degree of flexure outwards.

The *ramus* is a flat, thin, short *apophysis*, which, running obliquely downwards, unites with that of the *ischium*. The two *rami* of the *ischia* and of the *ossa pubis* form on the anterior and inferior part of the *pelvis* an arch, which is usually called the arch of the *pubis*. This arch is much larger in women than men ; which circumstance is favourable to the emergence of the head of the child at the time of birth, and constitutes the most distinguishing mark between the male and female *pelvis*.

SECTION II.

THE advantage to be derived from the knowledge of the bones of the *pelvis*, in a dried or separated state, is not very evident. But we may consider the previous intelligence of this
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and some other parts of our subject, as essentially useful and necessary, because it comprehends the rudiments of a more perfect knowledge than can be otherwise acquired; we shall therefore proceed to examine the manner in which these bones are connected.

To the two lateral surfaces of the *sacrum* are joined the posterior surfaces of the *ossa innominata*, and these are covered with a thin intervening cartilage, or ligamentous cartilage; the inequalities, as was before observed, contributing very much to the firmness of the junction. The *ossa innominata* are also joined at the anterior part by a thin cartilage, which covers the scabrous end of each bone, and the space between them is filled up with a ligamentous substance. This connexion is called the *symphysis* of the *ossa pubis* *.

Within the circuit of the *pelvis* the *periosteum* is thickened at the parts where the *ossa innominata* are joined to the *sacrum*, and at the *symphysis* of the *ossa pubis*. The *symphysis* has also been described as connected by a thin transverse liga-

* See a short but very precise account of the connexion of the bones of the *pelvis* by Dr. William Hunter.

Medical Observations and Inquiries, Vol. II.

ment, or by ligaments which form what may be considered as a capsular ligament, adhering to the part which it encloseth, and to which it gives the principal strength. Greater stability could not be procured by any internal mode of union, without a diminution of the cavity of the *pelvis*.

But on the external parts of the *pelvis*, where the union of the bones could be more firmly established by a ligament, there is no point where one is omitted; even the tendons of the muscles inserted into the projecting parts of the bones, though particularly designed for other purposes, eventually contribute to the strength of the *pelvis*.

From the posterior edges of those surfaces of the *ossa innominata* which are joined to the *sacrum* strong ligaments pass, which bind these bones firmly together; and all that unequal space behind them is filled up with small muscles, or the small parts of large muscles, in such a manner as to give in the fresh subject, when covered by their tendinous expansion, a surface almost smooth.

From the obtuse processes of the *ischia* strong ligaments arise, which, expanding, pass to the posterior edges and *apophyses* of the *sacrum*, detaching

taching in their passage small portions to the *os coccygis*. These ligaments are called the broad or external sacrosciatic. From the spinous processes of the *ischia* ligaments arise, which, crossing and adhering to the ligaments before described, pass to the inferior and inner edge of the *sacrum* and the upper part of the *os coccygis*, sending slips or small portions to the edges of this bone through its extent. These are called the internal sacrosciatic ligaments.

SECTION III.

By the knowledge of the parts where, and the manner in which, the bones of the *pelvis* are connected together, we are enabled to explain many uneasy sensations which women have, and many infirmities to which they are liable at the time of pregnancy and after their delivery.

It was for many centuries a received opinion, that these bones, though joined together in such a manner as scarcely to afford any suspicion of a separation,

separation, were always separated at the time of parturition; or that there was a disposition to separate, and an actual separation, if the necessity of any particular case required that enlargement of the cavity of the *pelvis*, which was consequent to it. The degree of separation was also supposed to be proportionate to such necessity; and if it did not take place, or not in such a degree as was required, distending instruments were contrived and used to produce or increase it: and upon the same principle the section of the *symphysis* of the *ossa pubis* hath been lately recommended. This opinion ought probably to be assigned as one reason, for the superficial notice taken by the early writers in midwifery, of those difficulties which are sometimes found to occur at the time of parturition, from the smallness or deformity of the *pelvis* *. To this may also be referred much of the popular treatment of women in child-bed,

* Edoctus assero, ossa pubis sæpe ab invicem in partu laxari, emollito eorum cartiliginoso connexu, totamque hypogastrii regionem, ad miraculum usque, ampliari; non quidem ab aquosæ substantiæ profusione, sed sua sponte, ut fructus maturi excludendis suis feminibus solent hiscere.

Harv. Exercitat, lviii.

In partu difficili et laborioso ossa ischii aliquantulum a se invicem dehiscunt.

Ruyseh. Adv. Dec. 2.

and

and many popular expressions in use at the present time. But this opinion hath been controverted by many writers, who assert, that there was neither a separation nor a disposition to separate; but that, when either of them did happen, they were not to be esteemed as common effects attendant on the parturient state, but as diseases of the connecting parts*. The disputants on each side have appealed to presumptive arguments, and to facts, proved by the examination of the bodies of those who have died in child-bed, in justification of their several opinions. But, notwithstanding all which has been said upon the subject, I know not that we are authorised by the experience of the present time to say, that a separation, or a disposition to separate, prevail universally at the latter part of pregnancy, or at the time of labour; yet that these effects are often, if not generally, produced, may be gathered from the pain and weakness at the parts

* Les uns et les autres disent, que ces os se separent ainsi a l'heure de l'accouchement, y ont ete disposez peu a peu auparavant, par des humiditez glaireuses qui s'ecoulent des environs de la matrice, lesquelles amollissent pour lors le cartilage qui les joint fermement, en d'autres temps. Mais ces deux opinions sont aussi eloignees de la verite que de la raison.

Mauricean, tom. I, livr. 2, cap. I.

where

where the bones of the *pelvis* are joined to each other, before and after delivery. In some cases pregnant women are also sensible of a motion at the junction of the bones, especially at the *symphysis* of the *ossa pubis*, and the noise which accompanies it may be sometimes heard by an attentive by-stander.

A strong presumptive argument in favour of the separation of the bones has been drawn from quadrupeds. In these the ligaments which pass from the obtuse processes of the *ischia* to the *sacrum*, on which the firmness of the junction of the bones very much depends; and which at all other times resist any impression attempted to be made upon them, are for several days previous to parturition gradually deprived of their strength, and the animal walks in such a manner as would incline us to believe could only be produced by a separation of the bones of the *pelvis*. Now it is not reasonable to conclude, that a circumstance which generally takes place in one class of viviparous animals should never occur in another, especially in a matter in which there is no essential difference.

We may, however, leave the question to be completely settled by future observations. To insist that either of the changes occur in every case, or that they never occur, seems an attempt
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to support opinions repugnant to daily experience. For no person, who has been conversant in the dissection of women who have died in childbed, can have wanted opportunities of seeing every intermediate state of these parts; from a separation in which the surfaces of the bones were loosened, and at a considerable distance from each other, to that in which there was not the least disposition to separate.

It then appears that the degrees of separation at the junctions of the bones of the *pelvis* to each other may be very different; and that, when it takes place beyond a certain degree, it is to be considered as morbid. Several cases of this kind, which have occurred in my own practice, and many for which I have been consulted, have laid me under the necessity of considering this subject with the most serious attention, and I presume that it may be produced by two causes; first, a spontaneous disposition of the connecting parts; secondly, the violence with which the head of the child may be protruded through the *pelvis*. Of a separation from each of these causes it will not be improper to give an example to prove the fact, and to shew its consequences*.

* In the 484th number of the Philosophical Transactions there is an account of the separation of the *symphysis pubis*, to the distance of four inches, occasioned by the sudden starting of the horse when a gentleman was riding.

C A S E I.

A YOUNG lady of a healthy constitution and lively disposition, who was married in the twenty first year of her age, was, in the beginning of 1774, delivered of her third child, which was unusually large, after a very severe and tedious labour. For several days before her delivery she was rendered unable to walk without assistance, by pain and weakness in her loins. Her recovery was favourable and uninterrupted, except that for several succeeding weeks she was incapable of standing upright or putting one foot before the other; the attempt to do either being attended with pain, and a sense of looseness or jarring, both at the parts where the *ossa innominata* are joined to the *sacrum* and at the *symphysis* of the *ossa pubis*. By the use of such medicines and means as contributed to strengthen her constitution she was soon able to walk, and, in a few months, was perfectly well.

Having before seen a case of the same kind, I suspected that these complaints were occasioned by the weakness of the connexion of the bones
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of the *pelvis*; and, imputing this weakness to too frequent parturition, she was advised to suckle her child a longer time; and accordingly continued a nurse for fifteen months.

After weaning her child she soon conceived again; and, when the time of her confinement drew near, the complaints which she had in her former pregnancy were increased to such a degree that she could neither walk or stand; and, for three weeks before her delivery, there was reason to suspect that the bones of the *pelvis* were separating.

July 7, 1777, she was delivered of her fourth child. At the time of her labour she had frequent faintings, great marks of disturbance and irritability, and was wholly unable to move her inferior extremities.

A few days after her delivery she had a fever, which terminated in an abscess in one of her breasts. By this, which was very painful and distressing, she was confined to her bed for near seven weeks. At the end of nine weeks she could walk with crutches, when she was sent into the country, from which she received much benefit; as she believed she likewise did by drinking half a pint of a strong infusion of malt twice daily. In about five months she was able

to walk without assistance, though she was sometimes sensible of the motion of the bones, which seem never to have been perfectly united.

About Christmas she was again pregnant; and in July, 1778, being indisposed to move, as she imagined, by the sudden and uncommon heat of the weather, the pain and weakness in her back returned, and she could not walk any more without assistance to the time of her labour, which came on October 11th. On the 13th she was delivered of a very fine child. Her labour, which was uncommonly severe and alarming, was made infinitely more fatiguing by her inability to move, all power of supporting herself being wholly lost, and every necessary change of position being made by her assistants.

On the fourth day after her delivery she was seized with a fever, which was soon removed, but her situation remained really deplorable. The pain at the junction of the bones continued; she had no command of her inferior extremities; and when she was moved the pain, which she described as the cramp, became excruciating, as if she was tearing asunder. Her stomach was at all times much disturbed; but, when she had the pain in an increased degree, a vomiting, or oppressive nausea, or hiccough, was brought on.

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The pain also produced strange sympathies in various parts, as a very teasing cough, a constant sneezing, a sense of weight in her eyelids, which she could not keep open, though she was not sleepy; noise in the bowels, and many other nervous affections: when, therefore, the pain was violent she had recourse to opiates, which she took discretionally, and the pain being quieted the sympathies soon ceased.

At the request of my patient I explained upon a skeleton the opinion entertained of her complaints; and, when I pointed out the manner in which the parts were supposed to be affected, she was fully persuaded of the truth of the opinion.

In this situation she had remained for several months, when it was thought expedient that she should be raised from her bed, and make an effort to stand or walk, lest her complaints should be rendered worse by the habit of resting so long in an inactive state. Every position was tried, and every contrivance made, which had a chance of being useful; but the power of supporting herself was totally gone; the motion of the bones was plainly perceived; and the consequences of every trial were so painful and uncomfortable that it was not judged proper to

repeat them, but to wait till, by time, the connexion of the bones was more confirmed.

About six months after her delivery she menstruated, which she has continued to do at irregular periods; yet, though much benefit was expected from this circumstance, no alteration was produced by it with respect to her complaints.

In the year 1779 she was removed, upon a couch, in a boat to *Margate*, for the benefit of the air and bathing in the sea, from which she was always sensible of receiving advantage. There she continued to reside; and when eight years were elapsed from the time of her delivery she became able to walk without crutches; and, though now perfectly recovered, her amendment was extremely gradual.

C A S E II.

MANY years ago I attended a young woman of a healthy but delicate constitution, who was in labour of her first child. The *os uteri* was fully dilated, the membranes broken, and the waters discharged, before I arrived at her house.

She was immediately put to bed, and the pains being very strong, the head of the child was
soon

soon pressed upon the *perinæum*, the laceration of which I endeavoured to prevent by supporting it in the usual manner; but the head of the child was forced through the external parts in opposition to the resistance which I was able to make.

At the instant when the head of the child was expelled I perceived something to jar under my hand, and was even sensible of a noise, which led me to suspect that the *perinæum* was lacerated by the sudden expulsion of the head.

After a short time the *placenta*, being separated and protruded into the *vagina*, was extracted without hurry or violence. The uneasiness of which she then complained, being supposed to be what are called *after-pains*, did not make me solicitous, but a few drops of *tinctura opii* were given to appease it.

On the following days she complained of more than usual pain in the lower part of the *abdomen*, which she did not accurately describe; but as there was no symptom of fever, and the milk was duly secreted, no particular inquiry was made, and I presumed that she would soon be well.

On the fourth day after her delivery she was taken out of bed, but could not stand or sit in

her chair on account of the pain and weakness in the part of which she originally complained, and which I found to be immediately upon the *symphysis* of the *ossa pubis*.

For near three weeks she remained in the same state, perfectly well in her health, and easy in her bed, unless when she attempted to turn on either side; but when she was removed from her bed she could neither stand or make any effort to walk without assistance, though she could sit for a few minutes, resting her elbows upon the arms of the chair.

The continuance of a complaint so very uncommon rendered it necessary to have a consultation, and a gentleman of great experience and ability was called in. After a very careful examination we found the internal parts in the natural situation and free from disease; the *perinaeum* was not lacerated, nor was there the least appearance of injury about the external parts. But it was judged by the seat of the pain, by her inability to stand or walk, except in particular attitudes and positions, that the *symphysis* of the *ossa pubis* had given way, and was wholly separated; and there was scarce a doubt but that the separation had taken place when the bulk of the head of the child was passing between the spinous

spinous processes of the *ischia*, when I was sensible of the jarring and noise.

As the opinion of the separation was chiefly founded on the particular attitudes and positions in which the patient sought relief, it seems necessary to describe them more fully, and they were very remarkable.

When she endeavoured to stand upright, which she could do better on one foot than both, and better with her feet close than at a distance, together with the pain at the *symphysis*, she had a sense of extreme weakness, accompanied with a faintness. When she first sat down in her chair, resting her elbows upon the arms of the chair, the complaints became tolerable. When she had remained a little time in this position they were again importunate, and she supported herself with her hands upon her knees, and presently bent forwards, so as to lean her elbows upon her knees; this position becoming irksome, she was obliged to return to her bed, where she was immediately easy. When she first attempted to walk she was compelled to bend forwards in such a manner as to rest her hands upon her knees, making a straight line from her shoulders to her feet,

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The explanation of her case, and the comfort she received from the assurance that was given of her recovery, encouraged her to bear her confinement and the present inconveniencies she suffered with composure; yet the knowledge we had acquired, presuming our opinion to be true, was useful, rather by teaching us how to avoid mischief, than by enabling us to render any actual service.

At the end of fourteen weeks, whilst she was in a coach, into which she had often been lifted for the benefit of air and exercise, she had a discharge which she supposed to be menstruous; and, though it had ceased before her return, she was sensible of immediate relief. From that time she mended daily, and in six weeks was able to walk, her complaints having gradually left her.

She had afterwards three children, with all which I attended her. Her labours were easy; and neither before nor after her delivery had she any tendency to the complaints I have been describing.

The discharge which preceded her recovery was thought to be menstruous; but as it had ceased before her return, and gave relief to a part not directly affected by menstruation, it is more reasonable to conclude that it was from the

symphysis;

symphysis; and of whatever kind it was, that it had acted as an extraneous body, preventing the re-union of the bones.

Instances have occurred, though they are rare, of women who, after labours, have suffered much pain in the region of the *sacrum*, and have lost all power of moving their inferior extremities; and the inability has been imputed to some paralytic affection. They are said to be bedridden, which describes the effect, though it does not explain the cause, of their disease. As these patients have, after a confinement of several months, or even years, been generally restored to the use of their limbs, it is not unreasonable to think that their infirmity was occasioned by a separation of the bones, which, at different periods after the accident, according to the degree of separation, had recovered their former connexion and strength.

SECTION IV.

AN inquiry into the manner in which the bones of the *pelvis* may re-unite when they have been separated seems necessary, as the treatment

ment to be enjoined, and the prospect of success, will be regulated by the idea we entertain of the state of the parts when separated.

When the connexion of the bones of the *pelvis* has either been impaired or destroyed, it is probable that a confirmation or re-union takes place by a restoration of the original mode; by a *callus*, as in the case of a fractured bone; or by *anchylosis*.

It is also possible for them to remain in a separated state; and that an articulation should be formed by the ends of each bone, at the *symphysis* of the *ossa pubis*, and at the junction of the *ossa innominata* with the *sacrum*; of which, by the favour of Mr. CLINE, I have seen an instance in the dead body, and have had reason to suspect the same accident in the living.

In all the lower degrees of imperfection in the union of these parts, it is reasonable to conclude that the former mode is restored soon after delivery; for the complaints which women make of pain and weakness in these parts are almost always relieved before their month of confinement is concluded; but, should they continue a longer time, it appears that the greatest benefit will be derived from rest and an horizontal position, which will lessen the present inconveniences,

cies, and favour that action of the parts, by which their infirmity must be repaired.

But, if the complaint is in an increased degree, and the health of the patient likewise affected, a longer time will be required for the recovery of the part; which may be forwarded by such means as invigorate the constitution, such applications as quicken the action of the parts, or by mechanical support.

Should the injury be too great to allow of the restoration of the original mode of union, of which we are to judge by the consequent impotence to move, a much longer time will be required for the formation of a callus, if that is ever done, but as a previous step to an *anchylosis*; which has been observed by anatomists to take place at the junction of the *ossa innominata* with the *sacrum*, not unfrequently, but never or very seldom at the *symphysis* of the *ossa pubis*. Under such circumstances, unless by an amendment of the general health, little good is to be expected from medicine, the process which the parts must undergo being an operation of the constitution, which it will not be in our power to control. In the first case related a variety of applications were tried, from the most emollient to those which are active and stimulating; but from cold
bathing

bathing only did she receive any real advantage. The patient was also very much assisted by the use of a swath, or broad belt, made of soft leather, quilted, and buckled with such firmness over the lower part of the body as to lessen, if not prevent, the motion of the bones; and this was restrained in its situation by a bandage passed between the legs, from the hind to the fore part of the belt.

In that unfortunate situation, in which a joint is formed between the separated surfaces of the bones, all hopes of the recovery of the patient to her former abilities may be given up; and what remains to be done for her relief will be by the use of a belt, or a similar contrivance, to substitute as much artificial firmness as we can, for the natural which is lost. In the case in which I suspected this event to have happened, the life of the patient was truly miserable; but I presume that such very rarely occur, having been lately informed of another person, who, after a confinement of eight years to her bed, in consequence of the separation of the bones at the time of labour, was restored to the full and perfect use of her inferior extremities.

SECTION V.

THERE is a wonderful variety in the position of the *pelvis* in the different classes of animals, as it relates to that of the body in general; and their powers and properties very much depend upon this circumstance. But, with a view to this subject, they may be divided into three kinds; the strong, the swift, and the mixed.

In those animals which possess the greatest share of strength the position of the *pelvis* is nearly perpendicular, and the two apertures of the cavity horizontal.

In those which are distinguished by their speed or agility the position of the *pelvis* is horizontal, and the two apertures nearly perpendicular.

In mixed animals, or those in which strength and speed are united, the position of the *pelvis* is neither horizontal or perpendicular, but inclined; so as to partake, by different degrees of inclination, of a certain share of the advantages of either position.

In the human species, when the position of the body is erect, the *pelvis*, which is stronger in proportion to their size than in any quadruped, is so placed that a line passing from the
third

third of the lumbar *vertebræ* will fall nearly upon the superior edge of the *symphysis* of the *ossa pubis*; the cavity of the *pelvis* being projected so far backwards, that the *ossa pubis* become the part on which the enlarged *uterus* chiefly rests in the advanced state of pregnancy*. If then we recollect the smallness of the *ossa pubis*, the manner in which they are connected, and advert at the same time to the increasing effect, which may be produced by the internal pressure of the weight supported by them, we shall not be surprised at the frequency of the complaints of pain and weakness at the *symphysis*; especially when the child is large, or the patient under the necessity of standing for a long time. And should there be any degree of weakness, relaxation, or disunion, at the parts where the *ossa innominata* are joined to the *sacrum*, similar effects will be produced; and one of these parts can scarcely be affected without an equivalent alteration in the other.

The consequences of the separation of the bones of the *pelvis*, or of their disposition to separate, will be more clearly comprehended if

* This part has been considered as the centre of gravity in the human body; but *Desaguliers* thought that it was in the middle space between the *sacrum* and *pubis*.

we consider the *pelvis* as an arch supporting the weight of the superincumbent body. In this view the *sacrum* may be called the key-stone; the *ossa innominata*, as far as the *acetabula*, the pendentives; and the inferior extremities, the piers of the arch.

If a greater weight be laid upon an arch than it is able to sustain, one of these consequences will follow; the key-stone will fly, the pendentives will give way, or the piers will yield to the pressure.

To prevent the two first accidents, it is usual to lay heavy bodies upon the different parts of the arch, the weight of which must bear a relative proportion to each other, or the contrary effect will be produced; for, if too great weight be laid upon the key-stone, the pendentives will fail; and, if there be too much pressure upon the sides, the key-stone will be forced.

When the greatest possible strength is required in an arch, it is usual to make what is called a counter-arch, which is a continuation of the arch till it becomes circular, or of any intended form. This contrivance changes the direction of the weight, before supported at the chord; and part of it will be conducted to the

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centre

centre of the counter-arch, and borne in what is called the sine of the arch.

If the resemblance of the *pelvis* to an arch can be allowed, we may consider all the fore or lower part of it, between the *acetabula*, as a counter-arch, which will explain to us the reason of so much stress being made upon the *symphysis* of the *ossa pubis*, when there is any increase of the superincumbent weight; or when that part is in a weakened or separated state, as in the second case before described.

When that patient laid in an horizontal position she was perfectly easy, there being then no weight upon the *pelvis*.

When she was erect, the weight borne by the *symphysis* being greater than it could support, she could walk before she could stand; or, if she stood, she was obliged to move her feet alternately as if she was walking; or she could stand upon one leg better than upon both. By these various movements she took the superincumbent weight from the weakened *symphysis* and conducted it by one leg, in a straight line, to the ground.

The fatigue of walking, or of the alternate motion of the feet, being more than she was able to bear, she was obliged to sit. When she
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first sat in her chair she was upright, resting her elbows upon the arms of the chair; by which means part of her weight was conducted to the chair, not descending to the *pelvis*. But there being then more weight upon the *symphysis* than it was able to bear for any long time, and her arms being weary, by putting her hands upon her knees, she took off more of the superincumbent weight, conducting it by her arms immediately to her knees. When she rested her elbows upon her knees the same effect was produced in an increased degree; but, this position becoming painful and tiresome, she had no other resource, and was obliged to return to her bed.

It cannot escape observation, that this patient instinctively discovered the advantages of the particular attitudes into which she put herself, and by which she obtained ease, as exactly as if she had understood her complaint, and the manner in which I have endeavoured to explain it.

In the weariness which follows common exercise, when we often change our position, apparently without design, the manner in which ease is procured to any particular part may be readily understood by a more extensive application of the same kind of reasoning.

SECTION VI.

THE violence which the connecting parts of the bones undergo, when the head of the child is protruded through the *pelvis* with extreme difficulty, sometimes occasions an affection of that part of more importance than a separation; because, together with the inconveniences arising from the separation, the life of the patient is endangered by it. This is the formation of matter on the loosened surfaces of the bones, preceded by great pain, and other symptoms of inflammation; though, in the beginning of the complaint, it is difficult to ascertain whether the connecting parts of the bones, or some contiguous part, be the seat of the disease.

When suppuration has taken place in consequence of the injury sustained at the junction of the *ossa innominata* with the *sacrum*, the abscess has in some cases formed near the part affected, and been cured by common treatment. But in others, when matter has been formed and confined at the *symphysis* of the *ossa pubis*, the symptoms of an hectic fever have been produced, and the cause has been discovered after the death of the patient. In others the matter has burst through
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the capsular ligament of the *symphysis* at the inferior edge, or perhaps made its way into the bladder; and in others it has insinuated under the *periosteum*, continuing its course along the *pubis* till it arrived at the *acetabulum*. The mischief being thus extended, all the symptoms were aggravated; and, the matter making its way towards the surface, a large abscess has been formed on the inner or fore part of the thigh, or near the hip, and the patients, being exhausted by the fever and profuse discharge, have at length yielded to their fate. On the examination of the bodies after death, the track of the matter has been followed from the aperture of the abscess to the *symphysis*, the cartilages of which were found to be eroded, the bones carious, and the adjacent parts very much injured or destroyed.

It may, perhaps, be possible to discover, by some particular symptom, when there is in this part a disposition to suppurate; or it may be discovered when suppuration has taken place. In all cases of unusual pain, attended with equivocal symptoms, it will therefore be necessary to examine these parts with great care and attention. For, when there is a disposition to suppurate, by proper means it might be removed; and when

matter is formed, if there be a tumefaction at the *symphysis*, more especially if a fluctuation could be perceived, we might deliberate upon the propriety of making an incision to evacuate the matter; and by such proceeding further bad consequences might be prevented*.

SECTION VII.

THE form of the superior aperture of the *pelvis* has been described by some as triangular, and by others as oval, with the widest part from one side to the other. But the inferior aperture, independent of the ligaments and soft parts, cannot be said to resemble any known or general form, on account of its irregularity, though the widest part is from the inferior edge of the *symphysis* to the point of the *os coccygis*, allowing for the regressive motion of that bone.

The dimensions of the superior aperture of the *pelvis*, from the upper part of the *sacrum* to the upper edge of the *symphysis*, are generally

* See *Medical Observations and Inquiries*. Vol. II.

stated to be rather more than four inches; and between the two sides they somewhat exceed five*.

Of the dimensions of the inferior aperture it is difficult to form a judgment; but if the ligaments are preserved it may be said that the proportions are reversed, the narrowest part being on each side. But in the form and dimensions of the *pelvis*, in different women, there is an endless variety, not depending upon any alteration which may be produced by disease.

The depth of the *pelvis*, from the upper part of the *sacrum* to the point of the *os coccygis*, is about five inches; but this will be increased when the latter bone is pressed backwards. From the margin of the *pelvis* to the inferior part of the obtuse processes of the *ischia* the depth is about three inches, and at the *symphysis* about one and a half. It appears that the depth of the *pelvis*, at the posterior part, is rather more than three times the depth at the anterior; and that there is a gradual change between the two extremes, if we admit the ligaments to make a part of the outline of the inferior aperture. The knowledge of these circumstances will

* Quæ mensuræ, pollice ferè integro, similes mensuras capitis foetus superant, Haller. *Physiolog.* lib. xxviii.

enable us to judge, in the living subject, how far the head of the child has proceeded through the *pelvis*, and prevent any deception to which we might be liable, if we were to form our opinion by the readiness with which we can feel the head at the anterior part.

The cavity of the *pelvis* is of an irregular, cylindrical form; but, towards the inferior aperture, there is some degree of convergence, made by the points of the spinous processes of the *ischia* and the termination of the *os coccygis*. This convergence is of great importance in regulating the passage of the head of the child, as it descends towards the inferior aperture; and, being perfected by the soft parts, it gives to the *vertex*, or presenting part of the head, the disposition to emerge under the arch of the *pubis*.

On the concavity or hollow of the *sacrum* the ease or difficulty with which the head of the child passeth through the *pelvis* will very much depend; and a similar curvature is continued by means of the ischiadic *sinus*, and by the disposition of the sacrosciatic ligaments to the obtuse processes of the *ischia*, where the sides of the *pelvis* are perpendicular. The upper edge of the *ossa pubis* has a slight reflection outwards, which prevents
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any obstruction to the entrance of the head of the child into the *pelvis*; and at the lower edge there is some degree of divergence, by which the departure of the head out of the *pelvis* is very much facilitated.

SECTION VIII.

BEFORE we proceed to the examination of the manner in which the head of the child passeth through the *pelvis* at the time of birth, it is necessary to examine its dimensions and structure.

The largest part of the head of a child, not altered by compression, is from the hind to the forehead. The diameter from one ear to another is less by nearly the same proportion, as the space between the *sacrum* is less than that between the sides of the *pelvis*, at the superior aperture.

The head of a child, which appears to be larger according to the size of the body than that of other animals, is at the time of birth incompletely ossified at every part where the bones

bones of which the *cranium* is composed afterwards unite; but chiefly at the greater fontanelle, or the centre of that part where the parietal and frontal bones meet in the adult. By this incomplete ossification, and by the pressure to which the head of the child is sometimes subject in its passage through the *pelvis*, the form of the head may be very much altered, and the dimensions lessened; for the edges of the bones will not only accede to each other, but will lap over in a very extraordinary manner, without any detriment to the child. The degree of ossification varies in different subjects; but the head of a newborn infant is universally found to be incompletely ossified, and the advantage resulting from it is not only perceived in those difficulties which may be occasioned by the natural large size of the head of the child, but in those also which are produced by all the lower degrees of deformity of the *pelvis*. It is evident, beyond all doubt, if this provision had not been made, that many children must have been destroyed at the time of birth, or their parents must have died undelivered.

Daily experience very obviously and sufficiently proves that there is a relative proportion between the head of the child and the *pelvis* of
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the mother; and, from the excellent order observed in all the operations of Nature, it is reasonable to conclude that the largest part of the head is conformable to the widest part of the *pelvis*. By the examination of a great number of women, who have died in various stages of the act of parturition, it has appeared, contrary to the general doctrine of the ancient and of some modern writers, when the position of the head was perfectly natural, that the ears were placed towards the *sacrum* and *pubis*, or a little obliquely; and that the *vertex*, or that part where the hair diverges, is exactly or nearly opposed to the centre of the superior aperture of the *pelvis**. In the course of the descent of the head, there being some difference in the form of the *pelvis* at each particular part of the cavity, the position of the head is accommodated to each part, not by accident but compulsion, in consequence of that convergence at the lower part of the *pelvis* beforementioned. With respect to the *pelvis*, the lower the head of the child has descended, the more diagonal is the position of the ears; but they are not placed exactly towards the sides of the *pelvis*, even when a

* This observation was first made by Sir FIELDING OULDE about the year 1737.

See his *Treatise on Midwifery*.

portion of the head has emerged under the arch of the *pubis*. But this description of the changing position of the head of the child in its passage through the *pelvis* is founded on the presumption that it presents naturally, and is guided by, the form of the internal surface. If the head should present differently, there will be corresponding, but not the same changes; or, if it should be very small, it will not be influenced by the *pelvis*, but may pass in any direction.

It does not appear that any ill consequences would follow an erroneous opinion of the manner in which the head of the child is protruded through the cavity of the *pelvis* in a natural labour; for, no assistance being wanted, no principle was required for the regulation of our conduct. But, in all cases in which there was a necessity of giving assistance, and where a change of what was deemed the wrong position of the head was improperly comprised as a very material part of that assistance, as in the use of the *forceps*, great mischief must often have been unavoidably done both to the parent and child.

SECTION IX.

FROM the examination of the form and dimensions of the cavity of the *pelvis*, and of the head of a child, attempts have been made to explain all the circumstances of a labour upon mechanical principles, and to establish the practice of midwifery upon the foundation of those principles.

It may be supposed, for a moment, that the passage of the head of a child, through the cavity of the *pelvis*, should be considered simply as a body passing through a space; and we may try whether it is possible to apply mechanical principles with advantage for the explanation.

The first circumstance to be considered in the attempt is, to ascertain with precision the capacity of the space. It is true that we have had many mensurations of the *pelvis* in all its parts, and that we have acquired a competent knowledge of the general dimensions; but we know, at the same time, that there is in the *pelvis* of every individual woman some variety, and that the exact knowledge of these varieties cannot be gained in any living subject.

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It is equally necessary that we should have an accurate knowledge of the size of the body intended to be passed through this space. But, though we have a good general idea of the figure and bulk of the heads of children at the time of birth, we are not ignorant that those of any two children were never found to be exactly alike, and that the peculiar difference cannot be discovered before a child is born.

The head of a child is of a limited size before it enters the cavity of the *pelvis*; but, by compression in its passage, this is altered in a manner and to a degree of which it is impossible to form any previous judgment.

In the consideration of a body passing through a space, there is also a necessity of knowing whether it be intended to pass by its own gravity or force, or whether it is passive, and is to be propelled by any adventitious power. If by the latter, as is the case of a child at the time of birth, the knowledge of the degree of that power is necessary to enable us to form an estimate of the possibility or likelihood of its success; but of the degree of this power we can form a very uncertain conjecture in any particular case.

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If then we have no precise ideas of the dimensions of the space, nor of the magnitude of the body, nor of the alterations in size or form which the body may undergo, nor of the power excited to propel the body, it does not appear possible to explain, upon mechanical principles, the progress of a labour.

So much is however to be granted to the introduction of mechanical principles into the practice of midwifery, that they afford the greatest advantage in all those cases of extreme difficulty in which the assistance of art is required, because such assistance must be given upon those principles; for, though they will not explain they will illustrate the operations of the animal body; and, when applicable, are the surest guides of human actions. But, on the whole, a fondness for, an imperfect knowledge, and some affectation of mechanical principles, seem to have been very detrimental; as to them the frequent and unnecessary use of instruments in the practice of midwifery may in a great measure be attributed.

SECTION X.

THE observations which were made on the form and dimensions of the cavity of the *pelvis* relate to its natural state; but they are also to be considered when the *pelvis* is distorted.

Of the distortion of the *pelvis* there are two general causes. The first is that disease incident to children in the very early part of their lives, known by the term *rachitis*, which, preventing the bones from acquiring their due strength or sufficient firmness to support the weight of the superincumbent body, they bend in different directions and degrees, according to the weight imposed upon them. The second is a disease which may occur at any period of life, and from its effect is called *osteosarcosis*, or *mollities ossium**. It is far less frequent than the *rachitis*, but more dreadful in its consequences, which no medicine hitherto tried has had sufficient efficacy to prevent or to cure. In this disease the ossific matter is not thought to be dissolved or altered, but to

* Malacosteon. Ossium mollities. Vogel. Dxxij.

be re-absorbed from the bones into the constitution, and carried out of the body by the common emunctories; or deposited upon some other part where it is useless or prejudicial. The bones thus losing the principle of their stability become soft, according to the degree and continuance of the disease; are unable to sustain the weight of the body, and change their natural forms, in proportion to their weakness; so that in some instances the most distorted and frightful appearance of the whole body hath been exhibited*.

The effect of either of these diseases is not confined to the *pelvis*; yet it is scarcely possible that either of them should exist for any length of time without producing their influence upon it.

The *pelvis* is more commonly distorted at the superior aperture than at any other part. This is particularly occasioned by the projection of the upper part of the *sacrum*, and the lowest of the lumbar *vertebræ*; though, in very bad cases, a considerable deviation from their natural position is given to several of the *vertebræ*. Should a disease exist in the constitution which is capable of weakening the bones, it will not appear extraordinary that the *sacrum* should be distorted, if

* See Medical Observations and Inquiries, vol. V. case 23.

we recollect that its texture is originally spongy; that it supports, both in the erect and sedentary position, a great part of the weight of the body; and that, by the manner of its junction with the last of the *vertebræ*, a considerable angle is made, which, if but little increased, will cause a very important change in the form and dimensions of the superior aperture of the *pelvis*. In some cases an irregular convexity, and in others a concavity, are produced by the bending of the *ossa pubis* in different ways and degrees; by which, together with the projection of the *sacrum* and lumbar *vertebræ*, the dimensions of the superior aperture of the *pelvis*, which in the narrowest part should exceed four inches, are reduced to less than one, and altered in every possible direction.

The form and dimensions of the cavity of the *pelvis* may be changed in any part of its space; but the most frequent alterations proceed from the *sacrum*, which, besides the projection before-mentioned, may become too straight, when the advantages which should be derived from its concavity will be lost. Or it may have too quick a curvature, by which the concavity will be rendered so small as not to admit the head of the child; or an exostosis may be formed on
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its internal surface, which will be the cause of inconveniencies equivalent to those occasioned by the want of a proper degree of curvature.

The *os coccygis* may be pressed inwards in such a manner that the point of it may approach the centre of the cavity ; or the motions between the different portions of the bone may be lost ; or an *anchylosis* may be formed between that bone and the *sacrum* ; by all which changes, according to their degree, the head of the child may be impeded in its passage through the *pelvis*.

The *ischia* may be distorted by the unnatural bent of the spinous processes ; and the effect of their pressure may be observed, for some time after birth, on the temporal or parietal bones of the head of a child propelled between them with much difficulty. The dimensions of the inferior aperture also may be lessened by the tuberosities of the *ischia* turning inwards or forwards, by which the arch of the *pubis* will be lessened, and rendered unfit to allow of the emergence of the head of the child, under the *symphysis* of the *ossa pubis*.

When the stability of the bones of the *pelvis* is impaired, it is not possible to enumerate every kind of distortion which they may suffer ; but it is principally in the degree that we are to seek

for those great, and sometimes insurmountable, difficulties which occur in the practice of midwifery, and prove dangerous both to the parent and child.

In some cases the distortion of one part of the *pelvis* produces an enlargement of the rest. Thus when the superior aperture is contracted, the inferior is expanded; and hence it is often observed in practice, when the head of the child hath passed the point of obstruction with the most tedious difficulty, that a labour will be unexpectedly and speedily completed.

When women have the appearance of being much deformed, it is reasonable to think that the *pelvis* must be affected. But there have been many instances of extreme distortion of the spine, yet the *pelvis* has preserved its proper form and dimensions; and some women, who were in other respects straight and well proportioned, have had a distorted *pelvis*.

If the inferior extremities are bent, or if any part of the body was distorted at a very early period of life, it is said that we may be assured the *pelvis* partakes of the disease, and is involved in its consequences. But, when the spine becomes distorted at a more advanced period, it is not to be esteemed a presumptive sign of a distortion
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of the *pelvis*, being generally occasioned by a local disease of the spine. These observations are, I believe, commonly well founded; but, as there are many exceptions, we should not be justified in giving an opinion of a case of this kind, unless we were permitted to make an examination *per vaginam*. Nor should we be able, by this examination, to determine with precision the existence of every small distortion, but when considerable in its degree. If we should not be able to feel any projection of the *sacrum*, or *vertebræ*, we should have a right to conclude that there was no considerable deformity of the *pelvis*; but, if we could feel the *sacrum*, or *vertebræ*, we must judge by the readiness with which they can be felt, of the degree of distortion; and of the impediments which may be thereby occasioned. But, in a matter of so much concern, it behoveth us to be extremely circumspect before we give an opinion, lest, by our error, the peace of families and the comfort of individuals should be destroyed.

CHAPTER II.

SECTION I.

ON THE EXTERNAL PARTS OF GENERATION.

THE preceding account of the *pelvis* appearing sufficient to serve all the useful purposes of the practice of midwifery, we shall, in the next place, consider the parts of generation, which have been properly divided into external and internal.

The external parts are the *mons veneris*, the *labia*, the *perinæum*, the *clitoris*, and the *nymphæ*. To these may be added, the *meatus urinarius*, or orifice of the *urethra*. The *hymen* may be esteemed the barrier between the external and internal parts.

That soft fatty prominence which is situated upon the *ossa pubis*, extending towards the groins
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and *abdomen*, is called *mons veneris*. Its use seems to be chiefly that of preventing inconvenience or injury in the act of coition. If a line be drawn across the anterior angle of the *pudendum*, all that part above it, which is covered with hair, may be called *mons veneris*; below it the *labia* commence, which, being of a similar, though looser, texture, appear like continuations of the *mons veneris*, passing on each side of the *pudendum*, which they chiefly compose. Proceeding downwards and backwards the *labia* again unite, and the *perinæum* is formed.

All that space between the posterior angle of the *pudendum* and the *anus* is called the *perinæum*, the external covering of which is the skin, as the *vagina* is the internal; including between them cellular and adipose membrane, and the lower part of the *sphincter ani*. The extent of the *perinæum* is generally about one inch and a half, though in some subjects it is not more than one, and in others exceeds two inches. The thin anterior edge is called the *frænum labiorum*.

Below the anterior angle of the *pudendum* the *clitoris* is placed, which rises by two *crura*, or

branches, from the upper part of the *rami* of the *ischia*. The external part, or extremity, of the *clitoris* is called the *glans*, which has a prepuce or thin covering, to which the *nymphæ* are joined. The *clitoris* is supposed to be the principal seat of pleasure, and to be capable of some degree of erection in the act of coition.

The *nymphæ* are two small spongy bodies, or doublings of the skin, rising from the extremities of the prepuce of the *clitoris*, and resembling in their form the *labia*. They pass on each side of the *pudendum*, within the *labia*, to about half its length, when they are gradually diminished till they disappear.

Immediately below the inferior edge of the *symphysis* of the *ossa pubis*, between the *nymphæ*, is the *meatus urinarius*, or termination of the *urethra*, which is about one inch and a half in length; and runs to the bladder in a straight direction, along the internal surface of the *symphysis*, to which, and to the *vagina*, it is connected by cellular membrane. On each side of the *meatus* are small orifices, which discharge a mucus, for the purpose of preserving the external parts from any injury, to which they might be liable from the acrimony of the urine.

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There is a very great difference in the appearance of all these parts in different women, especially in those who have had many children, and at various periods of life. In young women they are firm and vegete, but, in the old, these, together with the internal parts, become flaccid and withered *.

SECTION II.

THE external parts of generation are subject to many diseases in common with the other parts of the body. They are also exposed to some peculiar complaints, and to accidents at the time of parturition, of which we ought to be well informed, that we may, by our care, prevent them, or give such relief as may be required when they are unavoidable.

* Partes genitales, cum earum nullus est usus, marcescunt, detrahuntur, ac veluti obliterantur. *Harv.*

Ovaria in vetulis admodum exilia ut plurimum visuntur.

Ruyseh, Obs. Anat. xlv.

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The *labia* and *nymphæ*, as might be expected from their fatty and cellular texture, are liable to elongation, to excrescences, and to the production of scirrhus tumours; which in some instances have grown to an enormous size, especially in hot climates*.

It is not unusual for one of the *labia* to be larger and more pendulous than the other; but the enlargement, or elongation, are not regarded as diseases till some inconvenience is produced by them. The same observation may be made of excrescences or scirrhus tumours, which are therefore generally found to have acquired a considerable size before they are divulged by the patient.

In all the subordinate degrees of these complaints, when there is reason to think that they arise from some constitutional cause, relief may be given by such medicines or treatment as will alter and amend the general health. Or if they are owing to any specific cause, as the venereal disease, of which excrescences in particular are a very frequent consequence, mercurial medicines are to be used or given, till we are certain that the constitution is freed from the infection.

* *Nymphæ aliquando enormes sunt; quare Coptæ et Mauri eas circumcidunt.*

Haller; Physiolog.

Applications fuitable to the state they are in are at the same time necessary; and of these there will be occasion to use a variety, from the most emollient and soothing, which may be proper when the parts are in a very irritable or inflamed state, to those which have different degrees of escharotic qualities; when we presume there is a chance of removing the excrescences by such means. But when complaints of this kind have been of long continuance, or when the parts have increased to such a size as to hinder the common offices of life, there is but little reason to hope for their removal by any application or medicines, and the diseased part must be extirpated with the knife; which operation may be performed with safety, and the fairest prospect of success. As the blood-vessels are few, and naturally small in proportion to the size of the parts, there is not much danger of an hemorrhage, though, in some cases, this is said to have been alarming and extremely difficult to manage*. But I have more than once seen the enlarged *nymphæ* and several excrescences, of a considerable size, removed by the knife at the same time, yet the surgeon has not been under the necessity of tying a single blood-vessel.

* See Mauriceau, Vol. 2. Obs. clxxiv.

SECTION III.

EDEMATOSE swellings of the external parts may occur, either in a general anasarcaous state of the whole body, or when any cause produces a temporary pressure upon those vessels which are intended to conduct the returning fluids from the inferior extremities; particularly the enlarged *uterus*, in the advanced state of pregnancy. Whatever may be the cause of these swellings, if they should increase so as to become troublesome, the method of giving relief is obvious and easy, as it consists only in making a few slight scarifications in different parts of the *labia*, by which the stagnating fluids will be discharged, and the *labia* reduced to their natural size. It is not unusual for these swellings to return two or three times towards the conclusion of pregnancy; in which case, or even in the time of labour, the scarifications, if necessary, may be repeated. A flannel wrung out of some emollient fomentation, and applied to the parts when they have been scarified, will contribute to the easy and perfect discharge of the fluids.

SECTION IV.

THE cohesion of the *labia* to each other has been mentioned as a complaint occurring to adult women, especially in hot climates, if inflammation, preventing the due secretion of the mucus, with which these parts are naturally clothed on their internal surface, should take place; or if they should be excoriated by any accidental cause, and neglected in that state. The *labia* will also very frequently cohere in children, in such a manner as to leave no vestige of a passage into the *vagina*, except at the anterior part, for the discharge of the urine; and lead us, by the general appearance, to apprehend a defect in the organization of the parts. In such cases, we have been directed to separate them with a knife; and how far such an operation may be necessary in the adult, if the parts should cohere either in consequence of some new affection, or if a cohesion originating in infancy should continue to adult age, must depend upon the judgment of the surgeon. But, in infants, such an operation is neither requisite
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or proper; because a separation may always be made, by a firm and somewhat distracting pressure upon each *labium* at the same time, which scarcely makes the child complain; though the small vessels which had inosculated from one *labium* to the other, may be perceived to be dragged out during the continuance of the pressure.

It is extraordinary that so little notice should have been taken of a complaint which is very frequent in children; but it is probable that the constant and free use of their limbs, when they begin to walk, causes a separation without any other assistance, otherwise the cohesion must frequently have occurred in adults, in whom the case is very rare. But on this expected probable separation we should be afraid to rely. When a separation of the cohering *labia* has been made in the manner before-mentioned, a folded piece of linen, moistened in a very weak solution of the *vitriolum album*^t, or some lightly astringent liquor, should be applied every night when the child is put to rest, to prevent the reunion, to which there is a great disposition; and which will certainly take place if the *labia* are suffered to remain in contact.

SECTION V.

IN consequence of violent inflammation from accidental or other causes, the *labia* may become tumefied, and a large abscess be sometimes formed. This is attended with extreme pain, the desire of relieving which, has induced surgeons to open the abscess, and give vent to the matter as soon as it could be perceived to fluctuate. But though the pain may, for the present, be abated by the early discharge of the matter, the part continues indurated; is indisposed to heal; and sometimes becomes fistulous. But, if the abscess is suffered to break of its own accord, the part has the kindest tendency to heal, and the cure is soon perfected. Should the pain be extreme during the suppuration, besides the use of fomentations and cataplasms, recourse must be had to opiates for its abatement.

SECTION

SECTION VI:

THOUGH the *perinæum* is not often affected with any particular disease, it is subject to a laceration from the distention which it undergoes when the head of the child is passing through the external parts. This laceration, which is most likely to happen with first children, though with rude treatment, hurry, or neglect, either on the part of the patient or practitioner, it may occur with subsequent ones, especially in those women who have the *perinæum* naturally short; differs in direction and extent, and may be, in every degree, from the *frænum*, or edge of the *perinæum*, to the extremity of the *sphincter ani*, or even higher up into the *rectum*.

That some degree of laceration should occur will not be surprising, if we consider the great change and violence which all these parts sustain at the time when the head of the child is passing through them; or when a laceration begins, that it should extend through a part spread extremely thin, and suffering an equal degree of force. When the *perinæum* is indisposed

posed to distend; or if, when distended, it cannot permit the head of the child to pass with facility, the anterior part of the *rectum* is dragged out, and gives to the *perinæum* a temporary elongation. The true *perinæum*, and the temporary, as it may be called, thus forming an equal, uninterrupted space, if a laceration should commence at any part, it might extend through the whole. Of the method by which the laceration may be prevented, and of the treatment which may be proper when it has occurred, we shall speak in other places. At present we shall inquire into the causes of an accident; the prevention of which is the principal object of our attention in natural labours.

Though no means are used to prevent the laceration of the *perinæum* in quadrupeds at the time of parturition, it is remarkable that they are very rarely or never liable to it, except in those cases in which the necessity of their situation is supposed to require assistance; and this being given with ignorance and violence, may not improperly be esteemed the cause of the accident. It is therefore reasonable to presume that the frequent occurrence of this laceration in the human species, allowing that it is in some cases unavoidable, ought to be imputed to some

accidental cause, or to error in conduct, rather than to any peculiarity in the construction of the part, or in the circumstances of their parturition. For, I believe, no observation is more generally true, than that of the existence of a power in the structure and constitution of animals, by which evils are prevented or remedied, and by which all the difficulties occurring at the time of their parturition are overcome ; which power is commonly exerted with a degree of energy proportionate to the difficulty.

The causes disposing to, and capable of, producing a laceration of the *perinæum*, seem to be these :

First, The increased tenderness and delicacy of the skin, occasioned by peculiar habits or modes of living. That this and every other part of the body may, by alteration from its natural state, become more susceptible of pain, and less able to bear violence of any kind, is clearly proved by the different degrees of those properties in parts of the body which are usually clothed or uncovered.

Secondly, The position of women at the time of delivery. Women in this country, at the present time, are placed in bed upon their left side, with their knees drawn up towards the

the *abdomen*; which position, though convenient to the attendant, seems to occasion a projection of the part of the child which presents, in a line unfavourable to the *perinæum*. But, if they were placed upon their hands and knees, which is a position at that time perhaps the most natural, as it is often instinctively sought for, and, in some countries, chosen in cases of difficulty and distress; then the head or part presenting would, by its gravitation, lessen the pressure upon the *perinæum*, and, of course, the hazard of its laceration.

Thirdly, The disturbance of the order of a labour. Every change which is made in the parts at the time of labour is successive, and every pain seems to produce two effects; it dilates one part, and gives to some other part a disposition to be dilated. If therefore, by hurry, or imprudent management, the head of the child, in its passage through the *pelvis*, is brought into contact with parts which have not yet acquired their disposition to dilate; or if, by artificial dilatation, we attempt to supply the want of the natural, the parts will sooner be lacerated than distended.

Fourthly, When animals bring forth their young, the effort to expel is instinctive, no part

of the force being voluntary. Women, on the contrary, either from erroneous opinions, or from false instructions, exert a considerable degree of voluntary force, with the hope and intention of finishing their labours speedily. If we suppose that the *perinæum* is able to bear all the force instinctively exerted, without injury, but no greater; then the whole voluntary force will, in proportion to its degree, induce the danger of a laceration, unless its effect is counteracted by some adventitious help. On this principle it is usual to support the *perinæum*, not with the view of altering the direction of the head of the child, but of retarding its passage through the external parts. For the *perinæum* is not torn because the head of the child is large, or passes in any particular direction, but because it passes too speedily, or presses too violently, upon the parts, before they have acquired their dilatability; it therefore rarely happens that the *perinæum* is lacerated in very slow or difficult labours.

SECTION VII.

THAT kind of laceration of the *perinæum*, which commences at the anterior edge, and runs obliquely or directly backwards, is alluded to in every dissertation upon this subject. But there have been instances of another kind, which may be called a bursting or perforation of the *perinæum*, at that part which is connected with the circumference of the *anus*, when the anterior part is preserved; and through such perforation children have sometimes been expelled. In a case which occurred in my own practice, I was sensible of the laceration before the expulsion of the head, which I guided through the natural passage, supplying the want of the *perinæum* with the palm of my hand. The external parts were, in this patient, extremely rigid and contracted; and, as I applied myself with great assiduity to preserve them, I imputed the accident to this circumstance, rather than to the necessity of the case. The patient did not make any unusual complaint immediately after delivery; but, on the following day, there was a violent inflammation of the parts, with a sup-

F 3

pression

pression of urine, and the *ischia* were discharged through the ruptured part, though no *faeces* ever came by the *vagina*. By the use of fomentations and cataplasms, of cooling laxative medicines, and occasionally of opiates, the inflammation was soon abated. The suppuration being profuse, the bark was given ; and, at the end of ten weeks, the lacerated parts were healed. No particular examination was ever made during the cure ; and none but superficial dressings applied. When I attended this patient with her second child, I observed a large round cicatrice at the rugous part of the *anus*, but she scarcely suffered any inconvenience from it ; and recovered as well as if no such accident had formerly happened.

SECTION VIII.

THE *clitoris* is little concerned in the practice of midwifery, on account of its size and situation. But it is sometimes elongated and enlarged in such a manner as to equal the size of the *penis*, when it makes one of those many peculiarities which is supposed to constitute an hermaphrodite,

hermaphrodite*, or an animal partaking of the sexual properties of the male and female; but if there are any examples of true hermaphrodites, the term is, in this case, improperly used †.

Should the *clitoris* increase to such a size as to occasion much inconvenience, it may be extirpated either with the knife or ligature; but if the cause of the enlargement, which is commonly assigned, be true, it is probable that no motive of delicacy or inconvenience will be a sufficient inducement to suffer the pain of extirpation ‡.

SECTION IX.

THE bladder and *urethra* in women are naturally liable to fewer diseases than the same parts in men, because their connexion is far more

* Hermaphroditi veri non dantur.—*Ruyseb. Thes.* viii.

† *Clitoris* major in foetu existit.—*Ruyseb. Thes.* vi. l. i. *Cercosis.* Clitoris prælonga. Vogel, ccccxv.

‡ Quæ extra venerem, in casta femina parva fuerat, suo etiam modo arrigit et intumescit, ut preposteræ veneri servire possit, multoque usu ejus turpitudinis, denique moles ejus augetur.—*Haller: Physiolog.*

simple, and their use is wholly confined to the reception and conveyance of the urine. Women have, nevertheless, a stone sometimes formed in the bladder; and it has been thought an improvement in practice to evade the operation of lithotomy, by distending, with bougies gradually enlarged, the *urethra*, till it is of sufficient dimensions to allow a stone to pass through it. It is proved by experience, that the *urethra* will distend, or may be artificially distended, sufficiently to allow a stone of a considerable size to pass; but, if the distention be carried beyond a certain degree, the tone of the part will be destroyed, and the patient ever remain subject to an involuntary discharge of urine, which is a greater evil than any of the common consequences of lithotomy.

In the course of the *urethra*, and about the *meatus urinarius*, excrescences sometimes grow, which produce symptoms equally troublesome, and similar to those which are caused by the stone or other diseases in the bladder, for which they are often mistaken. These may be extirpated by the knife, by ligature, by caustic applications, or by wearing bougies, according to their size, or the part where they grow; which may render one method more convenient or preferable to the rest.

SECTION X.

THE *pruritus*, or itching of the external parts, is a complaint to which women are liable at any period of life; but it is most frequently attendant on the state of pregnancy, of which it is one of the most troublesome consequences. If it affects the internal parts, or is excessive in its degree, it is said to terminate in the *furor uterinus*. It is sometimes occasioned by a disease or affection of the bladder, and is then equivalent to the itching of the *glans penis* in men; but it more commonly proceeds from some affection of the *uterus*, having been most frequently observed to occur in pregnancy, especially when the child was dead; or about the time of the final cessation of the *menfes*, when there was a disposition to disease in the *uterus*.

The means used for the relief of the patient must depend upon the seat, the cause, and the degree of the complaint. When it happens during pregnancy, and at all other times, if attended with inflammation, it is necessary to bleed; to give gentle laxative medicines; and to use sedative applications; of which perhaps the best

best is a weak solution of *cerussa acetata*, as a lotion; or a decoction of poppy heads, with a small quantity of *cerussa acetata* dissolved in it, as a fomentation. More active applications are often prescribed; but I have suspected that these, in many cases, rather aggravate than lessen the complaint. If the patient be pregnant, the attempt to cure it will be vain; and we must be satisfied with moderating it till she is delivered, when it will cease spontaneously. When this complaint is independent of pregnancy, originates from an affection of the *uterus*, and is of long continuance, the applications must be varied, and such medicines given as promise relief by changing the state of that part. Sulphur, taken internally, has sometimes been of much service; or applied to the part as a powder, liniment, or lotion. The burnt sponge with nitre, or the *extractum cicutæ*, have also been used with advantage; together with a lotion composed of equal parts of the *aqua zinci vitriolati cum camphora* and rose water; or the application of the *unguent. hydrargyr. fort.* I have also frequently given five grains of *Plummer's* pill every night at bed-time for a month, and a pint of the decoction of *sarsaparilla* daily; though there was no suspicion of any venereal infection,

of

of which the itching is, I believe, a very unusual symptom. But when this complaint is occasioned by an affection of the bladder, the constant or daily use of a bougie in the *urethra* has, in some cases, effectually cured the patient.

SECTION XI.

THE *hymen* is a thin membrane of a femilunar, or circular form, placed at the entrance of the *vagina*, which it partly closes. It has a very different appearance in different women; but it is generally, if not always*, found in virgins, and is very properly esteemed the test of virginity, being ruptured in the first act of coition; and the remnants of the *hymen* are called the *carunculæ myrtiformes*†. The *hymen* is also peculiar to the human species; from which circumstance a moral writer might draw inferences favourable to the estimation of chastity in women.

* Membrana hymen, quæ utrum detur, necne, sub judice lis olim fuit, hoc autem tempore in anatomia magis versatis, nihil notius esse potest.—*Ruyfch. Thes.* iii. No. xv.

† Hymenis dissoluti reliquiæ, et corruptæ adeo pudicitiae indicia.—*Haller: Physiolog.*

There are two circumstances relating to the *hymen* which require medical assistance. It is sometimes of such a strong ligamentous texture, that it cannot be ruptured, and prevents the connexion between the sexes. It is also sometimes imperforated, wholly closing the entrance into the *vagina*, and preventing any discharge from the *uterus*; but both these cases are extremely rare.

If the *hymen* be of an unnaturally firm texture, but perforated, the inconveniencies thence arising will not be discovered before the time of marriage, when they may be removed by a crucial incision made through it, taking care not to injure the adjoining parts.

But the imperforation of the *hymen* will produce its inconveniencies, when the person begins to menstruate*. For, the menstruous blood being secreted from the *uterus* at each period, and not evacuated, the patient suffers much pain from the distention of the parts; many strange symptoms and appearances are occasioned, and suspicions injurious to her reputa-

* *Menses a membrana vulvam claudente suppressi, perque hujus incisionem evacuati.*—*Ruyfch. Obs.* xxxii.—and all the elder writers.

tion are often entertained. In a case of this kind, for which I was consulted, the young woman, who was twenty-two years of age, having many uterine complaints, with the *abdomen* enlarged, was suspected to be pregnant, though she persevered in asserting the contrary, and had never menstruated. When she was prevailed upon to submit to an examination, the circumscribed tumour of the *uterus* was found to reach as high as the navel, and the external parts were stretched by a round soft substance at the entrance of the *vagina*, in such a manner as to resemble that appearance which they have when the head of a child is passing through them ; but there was no entrance into the *vagina*. On the following morning an incision was carefully made through the *hymen*, which had a fleshy appearance, and was thickened in proportion to its distention. Not less than four pounds of blood, of the colour and consistence of tar, were discharged ; and the tumefaction of the *abdomen* was immediately removed. Several stellated incisions were afterwards made through the divided edges, which is a very necessary part of the operation ; and care was taken to prevent a re-union of the *hymen* till the next period of menstruation ;
after

after which she suffered no inconvenience. The blood discharged was not putrid or coagulated, and seemed to have undergone no other change, after its secretion, but what was occasioned by the absorption of its more fluid parts.

The *carunculæ myrtiformes*, by their elongation and enlargement, sometimes become very painful and troublesome. Under such circumstances they may be managed, or extirpated, if requisite, in the same manner as the diseased *nymphæ*.

CHAPTER III.

SECTION I.

ON THE INTERNAL PARTS OF GENERATION.

THE internal parts of generation are the *vagina*, the *uterus*, the *fallopian* tubes, and the *ovaria*. The ligaments may be esteemed appendages to the *uterus*.

That canal which leads from the *pudendum*, or external orifice, to the *uterus*, is called the *vagina*. It is somewhat of a conical form, with the narrowest part downwards; and is described as being five or six inches in length, and about two in diameter. But it would be more proper to say, that it is capable of being enlarged to those dimensions; for, in its common state, the *os uteri* is seldom found to be more than two inches from the external orifice, and the *vagina* is contracted as well as shortened.

The *vagina* is composed of three coats, the first or innermost of which is villous, interspersed with many excretory ducts, and contracted

tracted into *plicæ*, or small transverse folds, particularly at the fore and back part; but, by child-bearing, these are lessened or obliterated. The second coat is composed of muscular fibres and minute blood-vessels; and the third or outer coat is derived from the cellular membrane, by which it is connected to the adjoining parts. A portion of the upper and posterior part of the *vagina* is also covered by the *peritonæum*.

The entrance of the *vagina* is constricted by muscular fibres, originating from the *rami* of the *pubis*, which run on each side of the *pudendum*, surrounding the posterior part, and executing an equivalent office, though they cannot be said to form a true *sphincter*.

The upper part of the *vagina* is connected to the circumference of the *os uteri*, but not in a straight line, so as to render the cavity of the *uterus* a continuation of that of the *vagina*. For the latter stretches beyond the former, and, being joined to the *cervix*, is reflected over the *os uteri*; which, by this mode of union, is suspended with protuberant lips in the *vagina*, and permitted to change its position in various ways and directions: so that when these parts are distended at the time of labour, they are continued into each other, and there is no part
which

which can be considered as the precise beginning of the *uterus*, or termination of the *vagina*.

The form of the *uterus* resembles that of an oblong pear, flattened, with the depressed sides placed towards the *pubis* and *sacrum*; but, in the impregnated state, it becomes more oval, according to the degree of its distention*.

For the convenience of description, and for some practical purposes, the *uterus* is distinguished into three parts; the *fundus*, body, and *cervix*. The upper part is called the *fundus*, the lower the *cervix*, and the space between them, the extent of which is undefined, the body. The *uterus* is about three inches in length, about two in breadth at the *fundus*, and one at the *cervix*. Its thickness is different at the *fundus* and *cervix*, being at the former rather less than half an inch, and at the latter somewhat more; and this thickness is preserved throughout pregnancy, chiefly by the enlargement of the veins and lymphatics, there being little comparative alteration in the size of the arteries†. But there is such a variety in the *uterus* in different women;

* Facies uteri anterior planior est, convexior posterius; latera pene in aciem extenuata.—*Roederer*.

† Pars magna crassitie uteri ad venas pertinet.—*All the older Writers*.

independent of the states of virginity, marriage, or pregnancy, as to prevent any very accurate mensuration.

The cavity of the *uterus* corresponds with the external form. That of the *cervix* leads from the *os uteri*, where it is very small, though a little wider in the middle, in a straight direction, to the *fundus*, where it is expanded into a triangular form, with two of the angles opposed to the entrance into the *fallopian* tubes. There is a swell, or fulness, of all the parts, towards the cavity, which is sometimes distinguished by a prominent line running through its middle.

The villous coat of the *vagina* is continued over the *os uteri*, and lines the cavity of the *uterus* *. The internal surface of the *uterus* is corrugated in a beautiful manner, but the *rugæ*, which are longitudinal, lessen as they advance into the *uterus*, the *fundus* of which is smooth. In the intervals between the *rugæ* are small orifices, like those in the *vagina*, which discharge a mucus, serving, besides other purposes, that of

* Pulposum magis quam vaginæ velamentum aliquoties reperi. — *Haller; Physiolog.*

closing the *os uteri* very curiously and perfectly during pregnancy *.

The † substance of the *uterus*, which is very firm, is composed of arteries, veins, lymphatics, nerves, and muscular fibres, curiously interwoven and connected together by cellular membrane. To these, according to some anatomists, are to be added glands, ligamentous and parenchymatous substances.

The arteries of the *uterus* are the spermatic and hypogastric.

The spermatic arteries arise from the anterior part of the *aorta*, a little below the emulgent, and sometimes from the emulgent. They pass over the *psoas* muscles, behind the *peritonæum*, enter between the two *laminae*, or duplicatures of the *peritonæum*, which form the broad ligaments of the *uterus*, proceed to the *uterus*, near the *fundus* of which they insinuate themselves, giving branches in their passage to the *ovaria* and *fallopian* tubes.

* Adeo abundans ut totam cervicem repleat, et osculum quasi obturet. — *Haller; Physiolog. and many of the older Writers.*

† In gravida femina in laminae possit dividi, et in morbis in lacinias, squamasque. — *Noortwyck. Uter. Gravid. t. l. c.*

The hypogastric arteries arise from the internal iliacs, and, passing down the inside of the *pelvis*, divide into three branches, the anterior of which retains the name of hypogastric; the middle is called the *pudica interna*; and the third the *sciatica*. The first is the remnant of the umbilical artery, and is reflected over the side of the bladder, where it soon becomes imperious; the second goes from the sides of the *pelvis* to the edges of the *uterus*, which it enters at the upper part of the *cervix*, and then, penetrating the substance of the *uterus*, divides into two branches, the smallest of which runs along the *os uteri* to the *vagina*; but the larger passes with many convolutions to the upper part of the *uterus*, where its branches anastomose with those of the spermatic artery. The hypogastrics in their passage to the *uterus* detach branches to the bladder and adjoining parts.

The veins which reconduct the blood from the *uterus* are very numerous, and their size, in the unimpregnated state, corresponds to that of the arteries; but their enlargement during pregnancy is such, that the orifices of some of them, when divided, will admit of a quill, or the end of a small finger. The veins anastomose in the manner of the arteries, which they accompany

out of the *uterus*; and then, having the same names with the arteries, spermatic and hypogastric, the former proceeds to the *vena cava* on the right side, and on the left to the emulgent vein; and the latter to the internal iliacs.

From the substance and surfaces of the *uterus* an infinite number of lymphatics arise, which, following the track of the blood-vessels, pass to the glands, lying in an angle made by the departure of the emulgents from the trunk of the descending *aorta*.

The *uterus* is supplied with nerves from the lower mesocolic *plexus*, and from those which pass through the perforations of the *sacrum*, which also send large branches to the bladder and *rectum*. The *ovaria* receive a few small branches of nerves through the broad ligaments, but their principal ones are from the renal *plexus*. By the great number of nerves these parts are rendered extremely irritable; but it is by those branches which the *uterus* receives from the intercostal that the intimate consent between it and various other parts is chiefly preserved.

The muscular fibres of the *uterus* have been described in a very different manner by anatomists, some of whom have asserted that its

substance was chiefly muscular, with fibres running in transverse, orbicular, or reticulated order; whilst others have contended that there were no muscular fibres whatever in the *uterus*. In the unimpregnated *uterus*, when boiled for the purpose of a more perfect examination, the former seems to be a true representation; and, when the *uterus* is distended towards the latter part of pregnancy, these fibres are very thinly scattered; but they may be discovered in a circular direction about the *cervix*, and surrounding the entrance of each fallopian tube in a similar order. Yet it does not seem reasonable to attribute the extraordinary action of the *uterus* at the time of labour to its muscular fibres only, if we are to judge of the power of a muscle by the number of fibres of which it is composed, unless it is presumed that those of the *uterus* are stronger than in common muscles.

With respect to the glands of the *uterus*, these are not discoverable in its natural state; but, from the number of lymphatics which proceed from it, and from its appearance in a morbid state, there can be little doubt of their existence. Reasons might perhaps be advanced for an opinion that the *uterus* itself was a gland. By the term *parenchyma* has been understood a
spongy

spongy substance, of a softer and less vascular texture than the other constituent parts of any of the *viscera*; and of this there is said to be a certain portion in the *uterus*: but modern anatomists do not allow it, or that there is any distinct ligamentous substance to be found in the structure of the *uterus*. On this and many other occasions one has to lament the want of precision in the terms used for the explanation of the same ideas; from which much confusion has arisen, and many disputes have been carried on with unpardonable acrimony, not in the vindication of truth, but in the support of words.

From the angles at the *fundus* of the *uterus* two processes, of an irregularly round form, originate, called, from the name of the first describer, the *fallopian* tubes, which are evidently continuations of the substance of the *uterus*, but somewhat thinner. They are about three inches in length, and, becoming smaller in their progress from the *uterus*, have an uneven, fringed termination, called the *fimbriæ*. The canal which passes through these tubes is extremely small at their origin, but it is gradually enlarged, and terminates with a patulous orifice, the diameter of which is about one third of an

inch, furrounded by the *fimbriæ*. Through this canal the communication between the *uterus* and *ovaria* is preserved. The *fallopian* tubes are wrapped in duplicatures of the *peritonæum*, which are called the broad ligaments of the *uterus*; but a portion of their extremities thus folded hangs loose on each side of the *pelvis*.

The *ovaria* are two flat oval bodies, about one inch in length, and rather more than half in breadth and thickness, suspended in the broad ligaments at about the distance of one inch from the *uterus*, behind, and a little below the *fallopian* tubes *.

To the *ovaria*, according to the idea of their structure entertained by different anatomists, various uses have been assigned, or the purpose they answer has been differently explained. Some have supposed that their texture was glandular, and that they secreted a fluid equivalent to and similar to the male *semen*; but others, who have examined them with more care, assert that they are *ovaria* in the literal acceptation of the term; and include a number of vesicles, or *ova*, to the amount of twenty-two of different sizes, joined to the internal surface of the *ovaria*

* Ovaria in vetulis admodum exilia ut plurimum visuntur.
Ruyseh. Obs. Anatom. xlv.

by cellular threads or pedicles; and that they contain a fluid which has the appearance of thin lymph. All have agreed that the *ovaria* prepare whatever the female supplies towards the formation of the *fetus*; and this is proved by the operation of spaying, which consists in the extirpation of the *ovaria*; for the animal not only loses the power of conceiving, but desire is for ever extinguished.

The outer coat of the *ovaria*, together with that of the *uterus*, is given by the *peritonæum*; and whenever an *ovum* has passed into the *fallopian* tube, a fissure may be observed at the part through which it is supposed to have been transferred. These fissures healing, leave small longitudinal cicatrices on the surface, which are said to enable us to determine, whenever the *ovarium* is examined, the number of times a woman has conceived.

The *corpora lutea* are oblong glandular bodies, of a yellowish colour, found in the *ovaria* of all animals when pregnant, and, according to some, when they are salacious. They are said to be the *calyces* from which the impregnated *ovum* has dropped; and their number is always in proportion to the number of conceptions found in the *uterus*. They are largest and most conspicuous

cuous in the early state of pregnancy, and remain for some time after delivery, when they gradually fade and wither till they disappear. The *corpora lutea* are extremely vascular, except at their centre, which is whitish; and in the middle of the white part is a small cavity, from which the impregnated *ovum* is thought to have immediately proceeded.

From each lateral angle of the *uterus*, a little before and below the *fallopian* tubes, the round ligaments arise, which are composed of arteries, veins, lymphatics, and nerves, arranged in a very curious manner, connected by cellular membrane, and much enlarged during pregnancy. They receive their outward covering from the *peritonæum*, and pass out of the *pelvis* through the rings of the abdominal muscles to the groin, where the vessels subdivide into small branches, and terminate at the *mons veneris* and contiguous parts. From the insertion of these ligaments into the groin, the reason appears why that part generally suffers in all the diseases and affections of the *uterus*; and why the inguinal glands are in women so often found in a morbid or enlarged state.

The duplicatures of the *peritonæum*, in which the *fallopian* tubes and *ovaria* are involved, are
called

called the broad ligaments of the *uterus*. These prevent the entanglement of the parts, and are conductors of the vessels and nerves, as the mesentery is of those of the intestines. Both the round and broad ligaments alter their position during pregnancy*; appearing to rise lower and more forward than in the unimpregnated state. Their use is supposed to be that of preventing the descent of the *uterus*, and to regulate its direction when it ascends into the cavity of the *abdomen*.

SECTION II.

THE diseases of the internal parts of generation will be best understood if they are described in the order observed in the description of the parts.

The diseases of the *vagina* are, first, such an abbreviation and contraction as render it unfit for the uses for which it was designed; secondly, a

* Ovariorum eorumque ductuum situs mutatur, tempore gestationis et puerperii.—*Ruyseh. Thes. ix. No. xv.*

cohesion of the sides in consequence of preceding ulceration ; thirdly, cicatrices, after an ulceration of the parts ; fourthly, excrescences ; fifthly, *fluor albus*.

The abbreviation and contraction of the *vagina*, which usually accompany each other, are produced by original formation ; and they are discovered at the time of marriage, the consummation of which they prevent. The curative intentions are to relax the parts by the use of emollient applications, and to dilate them to their proper size by sponge, or other tents gradually enlarged. But the circumstances which attend are sometimes such as might lead us to form an erroneous opinion of the disease. A case of this kind which was under my care, from the strangury, from the heat of the parts, and the profuse and inflammatory discharge, was suspected to proceed from venereal infection ; and the patient had been put upon a course of medicines composed of quicksilver for several weeks without relief. When she applied to me I prevailed upon her to submit to an examination, and found the *vagina* rigid, and so much contracted as not to exceed half an inch in diameter, and not more than one inch and an half in length. The repeated, though fruitless, attempts
which

which had been made to complete the act of coition, had occasioned a considerable inflammation upon the parts, and all the suspicious appearances beforementioned. To remove the inflammation, she was bled, took some gently purgative medicines, used an emollient fomentation, and afterwards some unctuous applications; she was also advised to live separate from her husband for some time. The inflammation being gone, tents of various sizes were introduced into the *vagina*, by which it was distended, though not very amply. She then returned to her husband, and in a few months became pregnant. Her labour, though slow, was not attended with any extraordinary difficulty, and she was delivered of a healthy child.

SECTION III.

By the violence or long continuance of a labour, by the morbid state of the constitution, or by the negligent and improper use of instruments, an inflammation of the external parts, or *vagina*, is sometimes produced in such a degree
as

as to endanger a mortification. By careful management this consequence is usually prevented; but, in some cases, when the constitution of the patient was prone to disease, the external parts have sloughed away; and in others equal injury has been done to the *vagina*. But the effect of the inflammation is confined to the internal or villous coat, which is cast off wholly or partially. An ulcerated surface being thus left, when the disposition to heal has taken place, cicatrices have been formed of different kinds, according to the depth and extent of the ulceration; and there being no counteraction to the contractile state of the parts, the dimensions of the *vagina* become much reduced: or, if the ulceration should not be healed, and the contractibility of the parts continue to operate, the ulcerated surfaces being brought together may cohere, and the canal of the *vagina* be perfectly closed. By proper attention at the time of healing, this complaint might be prevented or lessened; and, as it differs in degree and situation, the inconveniences thence arising will vary in importance, and admit of relief with greater or less difficulty.

SECTION IV.

CICATRICES in the *vagina* very seldom become an impediment to the connexion between the sexes; when they do, the same kind of assistance is required as was recommended in the natural contraction or abbreviation of the part; and I believe they always give way to the pressure of the head of the child in the time of labour, though in many cases with great difficulty. Sometimes the appearances may mislead the judgment; for I was lately called to a woman in labour who was thought to have become pregnant, the *hymen* remaining unbroken. But, on making very particular inquiry, I discovered that this was her second labour, and that the part which, from its form and situation, we supposed to be the *hymen*, with a small aperture, was a cicatrice, or unnatural contraction of the entrance into the *vagina*, consequent to an ulceration of the part after her former labour.

When the sides of the *vagina* cohere together, it may be requisite to separate them with the
knife;

knife ; and, when they are in a healing state, their reunion may be prevented by tents, or by a leaden canula of a proper size, introduced into, and worn in the *vagina*. But, if the cohesion has taken place far up in the *vagina*, the knife must be used with the utmost circumspection, or irreparable injury may be done to the bladder, *rectum*, or some adjoining part. A patient under these circumstances, who applied to me for relief, and in whom the menstruous blood was secreted, though it could not be discharged, was advised to defer any operation ; as I presumed the menstruous blood, at some future time, would protrude the cohering parts in such a manner as to render the operation more secure, effectual, and easy. Accordingly, when they were stretched and protruded by the retained *menfes*, the point most eligible for perforation was indicated, and the operation was performed with great ease and safety.

SECTION V.

FUNGIOUS excrescences arising from any part of the *vagina*, or *uterus*, are distinguished by the general term *polypus*. These are of different sizes, and may sprout from any part of the cavity of the *uterus*, and perpend in the *vagina*; or from the *os uteri*; or from the *vagina*. The texture of the excrescences is also very different, being in some cases firm and fleshy, and in others fungous and almost as soft as coagulated blood; some of them hang by a small pedicle, and others have a broad basis. But these adventitious substances have not been accurately described by anatomists, or classed by physiologists; and practitioners who are not very guarded are therefore often led into error in their treatment and prognostic of the event of such cases.

The cause of the *polypus* may be some accidental injury done to the part at the time of labour; or a spontaneous disease of the part itself, or of the constitution; as they are frequently found in women who have never been pregnant. Those which are of a small size are no impedi-

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ment to conception or parturition, at least if they originate from the *os uteri* or *vagina*.

In the first stage the *polypus* may be accompanied with all those symptoms which proceed from uterine irritation; and in its progress, with a mucous, sanious, and afterwards a sanguineous discharge, increasing in quantity, and changing in appearance, according to the growth of the disease. By this discharge, and the continual pain, the patient is reduced to extreme weakness, and if relief be not given by the extirpation of the *polypus* she may perish from the mere loss of strength, or by the production of other diseases.

The *polypus* may be extirpated by ligature or excision, but the former is the preferable method; and the ligature is to be used in a similar manner, and upon the same principle, as in the extirpation of nasal *polypi*. The difficulty lies in the proper application of the ligature, and this depends upon the distance of the part to be tied from the external orifice, and the thickness of the basis of the *polypus*. If the circumstances of the case will admit of delay, the operation will be rendered more easy by deferring it, as the tumour will descend lower, and the pedicle become longer and thinner. When the ligature is fixed, which it should be as near to the root of the pedicle as possible,

possible, it must be drawn gradually tighter every day, by means of an instrument contrived for that purpose, till the excrescence drops off, which usually happens in four or five days; though the time will depend upon the firmness and thickness of the pedicle of the *polypus*; and, during the operation of the ligature, we must carefully watch any tendency there may be to inflammation in the *abdomen*. It should be a general rule not to pass a ligature for the extirpation of a *polypus*, unless we can feel the pedicle by which it grows, or we may be in danger of tying a part we did not intend; and we must distinguish the *polypus* from an inverted *uterus*. Should the *polypus* arise from the substance of the part, with a base larger or as large as the excrescence, the ligature cannot be fixed in the usual manner; for it will either slide over it, or take a partial hold of the *polypus*. In such cases, attempts to extirpate the tumours do not succeed; for they have usually a cancerous disposition.

Before the ligature is passed we should also be informed of the state of the *uterus*; for, if that be diseased, the patient will not profit by the extirpation of the *polypus*; and the practitioner may lose his credit, though acting with the greatest skill in the operation.

The *polypus* has sometimes terminated favourably without assistance, or with assistance of a different kind. After a long continuance of the disease, which may not have been suspected, or perhaps mistaken for some other, the tumour has pressed through the *vagina* and external orifice, and the pedicle being too weak to sustain its weight, it has decayed and dropped away; or, when the tumour has pushed through the external orifice, a ligature has been fixed round the pedicle, and the *polypus* has been perfectly and easily extirpated.

SECTION VI.

A mucous, ichorous, or sanious discharge from the *vagina* or *uterus*, is called the *fluor albus* *. These discharges are various in their degrees as in their kinds, from a simple increase of the natural *mucus* of the part, to that which is of the most acrimonious quality; but the first is not esteemed a disease, unless it is excessive in its de-

* *Lencorrhœa*. Nimia muci aut ichoris ex vulva profusio. — *Vogel*. cxix.

Cachexia uterina, sive fluor albus. — *Hoffman*.

gree. It is the most frequent disease to which women are liable, and is by them suspected to be the cause of every complaint which they may at the same time suffer; but it is generally a symptom of some local disease, or a consequence of great debility of the constitution, though, when profuse, it becomes a cause of greater weakness. In many cases the *fluor albus* is an indication of a disposition to disease in the *uterus*, or parts connected with it, especially when it is copious in quantity, or acrimonious in quality, about the time of the final cessation of the *menfes*; and before the use of such means as are merely calculated for the removal of the discharge, we must endeavour to restore the *uterus* to a healthy state.

The symptoms attending the *fluor albus*, whether it be an original disease, or a symptom of other diseases, are very similar. The complexion is of a pale, yellowish colour, the appetite is depraved, there is invariably a pain and sense of weakness in the back and loins, the patient has constantly a feverish disposition, with a wasting of the flesh and reduction of the strength, and ultimately becomes hectic or leucophlegmatic.

The method of relieving or curing the *fluor albus* must depend upon its cause, whether the dis-

charge proceeds from the *uterus* or *vagina*. When it is occasioned by general weakness of the constitution, all those medicines which are classed under the general term of corroborants or tonics, especially bark and preparations of iron, may be given, under a variety of forms, with great advantage. But their effect is not immediate; and, previously to their use, it will be proper and necessary that the patient should take some mild purgatives, and in all cases where there is any feverish disposition, she ought to lose some blood. Balsamic and agglutinating medicines of every kind are also frequently prescribed, but without much benefit. In some cases, preparations of quicksilver have been given with advantage, when there was no suspicion of any venereal infection. Gentle emetics have been recommended, and are supposed to be of singular use, not only by cleansing the *primæ viæ*, or by making a revulsion of the humours from the inferior parts, but by exciting all the powers of the constitution to more vigorous action. Cold bathing, partial or general, particularly in the sea, has often been of eminent service. In this, and all similar complaints, good air, moderate exercise, nourishing and plain diet, and a regular manner of living, will of course be advised.

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When there is reason to think that the complaint is local, and arises from the relaxation of those orifices by which a necessary *mucus* is discharged on particular occasions; or if the discharge should continue after an amendment of the constitution, injections of various kinds may be used daily. But the safest and best are those which are composed from astringent vegetables, as a strong infusion of green tea; proceeding cautiously to weak solutions of *cerussa acetata*, or *vitriolum album*, as is the practice in long-continued defluxions upon the eyes. Though these applications cannot well be expected to produce an absolute cure, they seldom fail to afford temporary benefit, which is a great comfort to the patient.

SECTION VII.

THE *uterus* is liable to many diseases, and, being a part with which the whole body is readily drawn into consent, there is scarce a disease under which women have at any time laboured, but what has been attributed to its influence: yet it is not proved that there is any essential difference

in those diseases of women to which men are equally subject, though there is some variety in the symptoms. We shall confine our attention to the most obvious diseases of the *uterus*, and begin with the *prolapsus* or *procidentia*, which very frequently occurs.

By the *prolapsus* is meant a subsidence or descent of the *uterus* into the *vagina*, lower than its natural situation, and it is termed a *procidentia* when the *uterus* is pushed through the external orifice of the *pudenda* *. This sometimes happens to such a degree as to put on the appearance of an oval tumour growing from the external parts, depending very low between the thighs, causing great pain and uneasiness, and rendering the patient unable to perform the common offices of life. A moderate share of circumspection will enable us to distinguish the *procidentia* of the *uterus* from its inversion, and from all resembling diseases.

There are many causes of the *prolapsus* or *procidentia* of the *uterus*; as long standing during the time of pregnancy, carrying heavy burdens, an extreme degree of costiveness, and all sudden and violent exertions of the body; whence they most

* *Hysteroptosis*. Uteri vel vaginæ procidentia.—*Sauvag.* xlix.

frequently happen to women in the lower ranks of life. They may be occasioned by the circumstances of a labour, as the descent of the *os uteri* into the *pelvis*, before it is dilated; by the preposterous efforts of the woman in an erect position; by the rude and hasty extraction of the *placenta*, and by rising too early after delivery. They may also be produced by mere relaxation of the parts, after a long-continued *fluor albus*, as unmarried women are sometimes subject to them, though less frequently than those who have had children. By the knowledge of the causes of these complaints, we are led to their prevention and cure; and it is worthy of observation, that, when a *prolapsus* or *proidentia* has been occasioned by the circumstances of one labour, they may be relieved, or perfectly cured, by care and long confinement of the patient in an horizontal position after the next. When women who have a *prolapsus* are pregnant, the inconveniences are increased in the early part of pregnancy, because the *uterus*, being enlarged, sinks lower than usual into the *vagina*; but in the latter part, they are lessened, as it is then supported above the brim of the *pelvis*: yet, when the *pelvis* is very capacious, and the parts much relaxed, the lower part of the *uterus*, including the head of the child, has in some

some cases been pushed through the external orifice, before the *os uteri* was dilated, even in the time of labour.

The *procidentia* is not, properly speaking, a disease of the *uterus*, but a change of its position, caused by the relaxation or weakness of those parts to which it is connected, and by which it should be supported. It accordingly most commonly happens that the first tendency to it is discovered by the protrusion or fulness of the anterior part of the *vagina*, and sometimes also the posterior part of the *vagina* becomes tumid, forming a kind of pouch; and this happens in some cases where there is no descent of the *uterus*. But, in the principal degrees of the *procidentia*, the position of the *uterus* and *vagina* is not only very much altered, but that of all the contiguous parts, especially the bladder*.

The intentions in the cure of the *procidentia* are, to restore the *uterus* to its proper situation, and to retain or support it when replaced.

The reduction of the parts to their situation is not usually attended with much difficulty, even in the worst degrees of this complaint. In some

* *Maximam vesicæ partim secum trahit.*—*Ruyfch. Advers. Dec. 1. 6.*—See Medical Observations and Inquiries, vol. iii. case 1. By Dr. Thomas White, of Manchester.

cases, however, it is necessary, by bleeding, confinement in bed, gently-purgative medicines, and emollient fomentations, to lessen the inflammation and tumefaction; and when the *proidentia* or *prolapsus* occurs soon after delivery, such means can only be used with propriety, as the parts are often in too irritable and tender a state to bear any other without mischief. When the parts are replaced, it will sometimes be proper to use local astringent and aromatic applications, in the form of a lotion or fomentation, conducted into the *vagina* by means of a syringe or sponge. But these will generally fail to answer our intention fully, and we shall be obliged to have recourse to pessaries, of which many have been contrived of various forms and substances.

The intention in the use of pessaries is to support the *uterus* in its situation, without injuring it or the adjoining parts; but certainly the kinds now in common use are ill calculated for one or both these purposes, as they can neither be introduced or worn without inconvenience, and often fail to answer our intention. They are generally made of box or ebony wood, or of cork covered with wax; by some the circular form is preferred; by others the oval; whilst others are persuaded that globular ones are the most effectual;

fectual; and they are certainly the most easy when introduced, though they cannot be used by women who live with their husbands. Much dexterity and judgment are also required in their introduction; for, if they are too small, they will not remain in the *vagina*; and, if too large, they will inflame and ulcerate the parts, causing the stranguery, obstinate costiveness, and many other painful symptoms. The size of those first used should be sufficiently large, and they may be gradually diminished, till they are no longer necessary. When a pessary has been introduced, it is requisite that the patient should, for some time, be kept quiet and in an horizontal position, by which the present inconveniences will be lessened, and the good we expect to be derived from it will be increased; yet, there is no doubt but that we are often disappointed in our expectations of the advantage to be gained by the use of pessaries, from impatience, or the want of attention in their application.

Pessaries, when introduced, are chiefly supported by the *perinæum*; but if this should have been lacerated, the common ones cannot be used. A sort has for such cases been contrived with stems, to which ligatures are to be fixed, and then brought forwards and backwards to a bandage round
round

round the waist. These are always very troublesome, and are therefore never recommended, unless no other kind can be worn, which is very seldom the case.

From the long continuance of a common pessary in the *vagina*, and sometimes from the entanglement and strangulation of the *os uteri* within the opening at its centre, there has been much difficulty when it was necessary to withdraw it. If it is possible to pass a piece of tape through the circular opening, and if we pull in a proper direction by both ends of it, with a firm and gradually increased force, so as to give the parts time to distend, we can hardly fail of success. But, if that is not possible, the rim of the pessary must be broken, or divided by a pair of sharp, strong *forceps*, of the kind used by watch-makers*.

It has been observed, that the use of pessaries, except the globular ones, does not hinder the act of coition, or conception; and when a woman has a *prolapsus* it is of great service that she should live with her husband†.

* See Chapman's Treatise on Midwifery, chap. lxxviii.

† Pessaire n'empêchent pas la femme d'user du coit, ni devenir grosse.—*Mauriceau*, v. 1. l. 3. c. 6.

An opinion was formerly entertained, that a *proidentia* of the *uterus* was beneficial in several other complaints to which women are liable, and that it was not proper to replace it; but I have never seen any reason for this opinion, though the reposition of the parts sometimes occasions a temporary uneasiness *. In some cases it is also said, that the *uterus* could not be returned, from its long continuance, or from the increased bulk of the neighbouring parts †; but I presume that all such cases might have been managed by persevering in the use of gentle evacuations, proper applications, and long confinement in an horizontal position.

* Contigit uteri prolapsus; quem ego affectum salutarem illi fore prædixi.—*Harv. Exercit. de Partu.*

† Restitui non semper debet, nec potest.—*Ruysch. Advers. ix. Anat. 9.*

SECTION VIII.

HYDATIDS *, or small vesicles, hung together in clusters, and containing a watery fluid, are sometimes formed in the cavity of the *uterus*. These have been supposed to proceed from *coagula* of blood, or portions of the *placenta*, remaining in the *uterus*; but there is generally reason to think that they are an original production of the *uterus*, independent of such accidental circumstances †.

The symptoms of this disease are such as are common in all cases accompanied with an increased degree of uterine irritation; and, as there is also a distention of the *abdomen*, from the enlargement of the *uterus*, it is not surprising that these cases should sometimes be mistaken for pregnancy. In the early part of the disease, the symptoms, though troublesome, are not alarm-

* *Hydatis*. *Vesicula cuticularis humore aqueo plena.*—*Cullen*. cxxi.

† *Hæc retentæ moles placentæ, penitus amittens genuinam suam indolem, quia est merus vasorum sanguiferorum contextus, integro suo corpore mutatur in congeriem hydatidum.*—*Ruyseh. Adv. Anat. Dec. 2.*

ing; but before or about the termination of nine months, the *uterus* makes its efforts to expel them, and the attending circumstances are similar to those of a labour. If the hydatids should be expelled without the occurrence of any dangerous symptom, there is no occasion for our assistance or interference. But if an hemorrhage should attend, or if the action of the *uterus* should be insufficient for their expulsion, it behoveth us to make gentle attempts to extract them, that the *uterus* may be at liberty to contract, and the orifices of the vessels be thereby lessened. We must, however, act with great caution; for, by hasty and rude proceeding, we should incur the danger of greater mischief than we mean to avoid.

SECTION IX.

There are upon record many histories of the dropfy of the *uterus*, which is described as a collection of water, or gelatinous fluid, in its cavity, the *os uteri* being so perfectly closed as to prevent its escape*. It is supposed to be occasioned by

* Ascites Uterinus.—*Sauvage*. Hydrometra.—*Cullen*.

an increased secretion, and a diminished absorption of lymph, as in collections of water in other cavities. The symptoms of this dropfy are the same as those which occur in the case of the hydatids, and when the action of the *uterus* comes on, the patient is usually imagined to be in labour; but, after a sudden discharge of water, the *abdomen* subsides, and, though chagrined at her disappointment, she recovers her former health.

The common explanation of the manner in which the water is confined in the *uterus* seems unsatisfactory, and, in the few cases of this kind which I have seen, is not just. For in these, the water being discharged, a membranous bag was afterwards voided, which, when inflated, put on the form of the distended *uterus*, of which it appeared to be a lining; so that what has been called a dropfy of the *uterus* is, probably, no more than one large hydatid.

Another kind of dropfy has been mentioned as appertaining to the *uterus*. In this the water is originally contained in the cavity of the *abdomen*, and, being absorbed by the termination of the *fallopian* tubes, is conveyed to the *uterus*, from which it is discharged; but of this I have never seen any satisfactory proof.

SECTION X.

It has been said, that wind may be collected and retained in the cavity of the *uterus* till it is distended in such a manner as to resemble pregnancy, and to produce its usual symptoms. By the sudden eruption of the wind, the tumefaction of the *abdomen* is removed, and the patient reduced to her proper size. Of this complaint I have never seen an example; but many cases have occurred to me of temporary explosions of wind from the *uterus**. When no injury has been done to the parts in former labours, I presume that this complaint happens to women with feeble constitutions and some particular debility of the *uterus*; it is reasonable, therefore, to expect advantage from such means as strengthen the habit in general, or give energy to the *uterus* itself.

* *Physometra*. *Tympanites uteri*.—*Cullen*. lxx.

Ædopsophia. *Flatuum per urethram, vaginam, vel uterum, emissio*.—*Sauvage*. xxxv.

SECTION XI.

By the term mole*, authors have intended to describe very different productions of, or excretions from, the *uterus*. By some it has been used to signify every kind of fleshy substance, particularly those which are properly called *polypi*; by others, those only which are the consequence of imperfect conception; and, by many, which is the most popular opinion, every *coagulum* of blood, which continues long enough in the *uterus* to assume its form, and to have only the fibrous part, as it has been called, remaining, is denominated a mole.

There is surely much impropriety in including under one general name appearances so contrary, and substances so different. Of the *polypus* we have already spoken. Of the second kind, which has been defined as an *ovum deforme*, as it is the consequence of conception, it might more justly be arranged under the class of monsters; and, though it has the appearance of being a shapeless

* *Mola*: *Massa carnea, vasculosa, ex utero excreta. Ovum deforme.*—*Vogel, ccclx.*

mass of flesh, if examined carefully with the knife, various parts of a child may be discovered, lying together, apparently in confusion. The pedicle also by which it is connected to the *uterus*, is not of a fleshy texture, but vascular, and seems to be a true umbilical cord; there is also a *placenta* and membranes containing waters. The symptoms attending the formation, growth, and expulsion, of this mass from the *uterus*, correspond with those of a well-formed child. With respect to the third opinion of a mole, an incision into its substance will discover its true nature; for, though the external surface appears to be fleshy, the internal part is composed merely of coagulated blood*. As substances of this kind, which most commonly occur after delivery, would always be expelled by the action of the *uterus*, there seems to be no reason for a particular inquiry, if popular opinion had not annexed the idea of mischief to them, and attributed their formation, or continuance in the *uterus*, to the misconduct of the practitioner. Hence the persuasion arose of the necessity of extracting all the *coagula* of blood out of the *uterus*, immediately

* *Excretiones uterinæ, sanguinæ, sæpe imponunt pluribus.*—*Ruyfch.*

after the expulsion of the *placenta*, or of giving medicines to force them away; but abundant experience hath proved, that the retention of such *coagula* is not productive of any danger, and that they are safely expelled by the action of the *uterus*.

SECTION XII.

THE *ovaria* are the seat of a particular kind of dropfy, which most commonly happens to women at the time of the final cessation of the *menfes*, though not unfrequently at a more early period of life. It is of the encysted kind, the fluid being sometimes contained in one cyst, often in several; and, in some cases, the whole tumefaction has been composed of hydatids not larger than grapes. Of these different kinds we may often be able to form a judgment by the evidence or obscurity of the fluctuation, and by the inequalities of the *abdomen*.

From the vesicular structure of the *ovaria* there may be some inherent disposition to this disease, or they may be affected like any other gland in the body, as it often happens to women

with strumous constitutions. But this kind of dropfy has usually been attributed to other causes; as accidents and rude treatment at the time of parturition, suppression of the *menfes*, obstructions of the *viscera*, or accidental injuries of the part. The symptoms attending it, are pain in the lower part of the *abdomen*, with a circumscribed tumour on one or both sides, gradually extending higher up, and across the *abdomen*, which, when there is a suppression of the *menfes*, is often mistaken for pregnancy; there is also, in some cases, a swelling of the thigh or leg of the same side with the diseased *ovarium*. In the early state of the disease, this dropfy may be distinguished from the *ascites*, for which it is often mistaken, by the circumscription of the tumour; but when it is increased to a large size, unless it be of an irregular form, and we are acquainted with the early symptoms, the distinction is very difficult. It is to be observed, that the secretion of urine is but little diminished, and the constitution apparently little affected in the beginning of the dropfy of the *ovaria*; and that, even after a long continuance of it, the principal inconveniences seem to arise from the pressure it makes, from the unwieldiness of the patient, and from apprehension of future mischief. It is also very remarkable,

remarkable, that this disease in many cases proceeds so very slowly that twelve or fourteen years, or often a longer time, may pass from its commencement to its greatest enlargement; and that if one *ovarium* only be affected, the patient may conceive and bring forth healthy children.

In the beginning of this dropfy, when the increasing *ovarium* is first perceptible through the integuments of the *abdomen*, there is often so much pain as to require repeated bleeding, fomentations, and opiates to appease it. When the disease has made a certain progress, no method of treatment has hitherto been discovered sufficiently efficacious to remove it, unless by incision or extirpation, which have been recommended, though seldom practised *. The fluid once deposited, seems to be out of the power of the circulation, its absorption not being promoted by the use of any of those evacuating medicines, which sometimes prove successful in the other kinds of dropfy, or by local applications, of which I have tried a great number. Recourse must then be had to the operation of the *paracentesis*, by which present relief is afforded, and

* In the cccclxxxi number of the Philosophical Transactions, there is a case of a dropfy of the *ovarium*, which was cured by an incision.

by a repetition of the same operation, as often as the return of the abdominal swelling to a certain size may require it, the life of the patient may be prolonged to extreme old age. Should there be any suspicion that the water is contained in different cysts, or that the tumour may be composed of hydatids, it is proper to inform the friends of the patient that the operation will not succeed, or not in a manner equal to our wishes; and it should be established as a general rule, that we be assured, by an examination *per vaginam*, that women are not pregnant, before this operation is performed, even supposing they have undergone the operation before; provided they are at a time of life and under circumstances which justify any suspicion of pregnancy. For, through the want of this circumspection, deplorable and irremediable mischief has in some cases been done to the patient, and the profession very much disgraced.

SECTION XIII.

THE *ovaria* are also subject, especially a short time after their delivery, to inflammation, terminating in suppuration, and to scirrhus and cancerous diseases, with considerable enlargement. In the former state they generally adhere to some adjoining part, as the *uterus*, the *rectum*, or external integuments; and the matter is discharged from the *vagina*, by stool, or by an external abscess of the integuments of the *abdomen*. But in simple enlargements of the *ovaria*, they continue detached and free from any adhesion; and, sinking lower down in the *pelvis* on one side, or in the hollow of the *sacrum*, produce inconveniences according to their size and situation. Of those by which the progress of a labour may be impeded, we shall speak in the detail of the causes of difficult labours; but an instance of a diseased *ovarium*, occasioning the symptoms of a retroverted *uterus*, is so well described in a case sent to me by my very ingenious friend Mr. *Everard Home*, now one of the assistant surgeons of *St. George's* hospital, that I shall beg leave to relate it.

Susannah

Susannah Fletcher, in the twenty-third year of her age, had a suppression of urine, which frequently required the use of the catheter. Not being able to support the expence of medical attendance, she obtained admission into the *Gloucester* infirmary, where, having continued for several months, without any other than temporary relief, she gave up all hope of being cured, and returned to her husband. She soon became pregnant, and, in a short time, was surpris'd to find that her complaint left her, though it returned immediately after her delivery. It disappeared a second time in the same manner, and under the same circumstances. Her husband went abroad while she was pregnant, and, after her delivery, she was obliged to go to service for her maintenance; but the daily necessity she was under of having the catheter introduced, rendering her unfit for that situation, she was admitted a nurse in the royal hospital at *Plymouth*, of which I was one of the assistant surgeons in *December 1778*.

She was then unable to void any urine without the catheter, she was habitually costive, her stomach was easily disturbed, and she was subject to hysteric fits. In all other respects she was tolerably

tolerably healthy, and menstruated with regularity.

In *May* 1779, in the agitation of a violent fit, she vomited a large quantity of blood ; and this hemorrhage frequently returning she died in the beginning of *June* following.

The body was opened in the presence of several gentlemen belonging to the hospital.

All the *viscera* of the *abdomen* were in a healthy state, except the stomach and *duodenum*, which were somewhat inflamed on their external surface, and the former internally also near the *cardia* ; but we could not discover the orifice of the vessel which had been ruptured.

Examining the contents of the *pelvis* we found the *uterus* pushed forward towards the *pubis* ; and the right *ovarium*, which was enlarged beyond the size of a hen's egg, and lying between the *vagina* and *rectum*, had formed a bed, and was so much fitted to that position, that it could not be easily retained in any other. The left *ovarium*, *uterus*, and bladder, were free from disease.

The situation of the right *ovarium* was no sooner observed, than it occurred to me that it had produced the same effect as when the *uterus* falls back upon its *cervix* in the retroversion of
the

the *uterus*; and with this idea, all the symptoms of the disease under which the poor woman had laboured, the removal of the suppression of urine during pregnancy, and its return after delivery, could be readily explained. The analogy between the symptoms of the retroverted *uterus*, and the effect produced by the diseased *ovarium*, were in this case too obvious to escape observation; but if the cause of the disease had been discovered during the life of the patient, it would have been difficult to have afforded relief, unless some surgeon had been intrepid enough to have passed a trocar through the posterior part of the *vagina* into the *ovarium*, and discharged the fluid which it was found to contain.

There have been instances of one of the *ovaria* passing under *Poupart's* ligament into the groin, or through the tendinous opening of the oblique muscles, where it has put on the appearance, and produced the same symptoms, as when a small portion of the *omentum* or intestines is strangulated: and relief has been obtained by the same mode of proceeding as if it were a real *hernia* of the intestine.

* In Mr. *Pott's* works there is a very curious case of this kind, in which both the *ovaria* were extirpated. The patient recovered, but never menstruated afterwards,

It

It is very remarkable that, in diseases of the *ovaria*, teeth, hair, bones, and other extraneous animal substances, are found in them so frequently, that there is scarce a collection of anatomical curiosities in which there are not various examples.

CHAPTER IV.

SECTION I.

THE principal parts contained in the cavity of the *pelvis* are, first, the *urethra*, which is connected with the internal surface of the *symphysis* of the *ossa pubis*, with its orifice terminating immediately below the inferior edge, and joined at its other extremity to the bladder, which, when filled with urine, extends into the cavity of the *abdomen*, and rests upon the upper edge of the *ossa pubis*. Secondly, the *vagina*, or canal which leads from the *pudendum* to the *uterus*, passing obliquely upwards and backwards; connected posteriorly with the lower part of the *rectum*, and anteriorly with the *urethra* and inner surface of the *ossa pubis*, as is the *uterus*, in part, to the bladder. Thirdly, the *rectum*, or intestine; the posterior part of which adheres to the hollow of the *sacrum*. But we are not to conclude that any part of the cavity of the *pelvis* is unoccupied; for, besides these principal parts, every space between

tween them is filled up with cellular or adipose membrane; and it seems as if by the pressure upon these, at the time of parturition, an effect equivalent to an absolute enlargement of the cavity was produced.

The cavity of the *pelvis* is considered, by anatomists, as the inferior part of the cavity of the *abdomen*; but, in a description of its contents, with a view to the practice of midwifery, it appears more convenient to speak of them as distinct cavities, separated by the *peritonæum*, which, descending from the fore part of the *abdomen*, passes over the *fundus* and posterior part of the bladder, ascends over the anterior part and *fundus* of the *uterus*, and then, making a deep inflection, covers the back part of the *uterus*, and the greatest portion of the *vagina*. It then reverts over the anterior part of the *rectum*, and proceeds to form a lining to the cavity of the *abdomen*.

By this inflection of the *peritonæum*, the *uterus*, during pregnancy, is permitted to expand more freely, and to rise without inconvenience into the cavity of the *abdomen*. But from the same cause women become liable to various diseases, to the retroversion of the *uterus*, to the *hydrocele*; or dropsy of the *perinæum*, and to that species of *hernia* which is occasioned by the descent

scant of the intestines between the *vagina* and *rectum*. But quadrupeds, by their horizontal position, are exempt from every disadvantage to which the inflection of the *peritonæum* may subject women.

By the term retroversion, such a change of the position of the *uterus* is understood, that the *fundus* is turned backwards and downwards upon its *cervix*, between the *vagina* and *rectum*; and the *os uteri* is turned forwards to the *pubis*, and upwards in proportion to the descent of the *fundus*, so that, by an examination *per vaginam*, it cannot be felt, or not without difficulty*. By the same examination there may also be perceived a large round tumour, occupying the inferior part of the cavity of the *pelvis*, and pressing the *vagina* towards the *pubis*. By an examination *per anum*, the same tumour may be felt, pressing the *rectum* to the hollow of the *sacrum*; and if both these examinations are made at the same time we may readily discover that the tumour is confined between the *vagina* and *rectum*.

Besides the knowledge of the retroversion which may be gained by these examinations, it

* It is a true subversion of the *uterus*, the *fundus* of which falls back upon the *vagina*.

is found to be accompanied with other very distinguishing symptoms. There is in every case a suppression of urine, with extreme pain, and such distention of the bladder, that the tumour formed by it in the *abdomen* often equals in size, and resembles in shape, the *uterus* in the sixth or seventh month of pregnancy. But it is necessary to observe, that the suppression of urine is frequently absolute only before the retroversion of the *uterus*, or during the time it is retroverting; for, when the retroversion is completed, there is often a discharge of some urine, so as to prevent an increase of the distention of the bladder, though not in a sufficient quantity to remove it. There is also an obstinate constipation of the bowels, produced by the pressure of the retroverted *uterus* upon the *rectum*, which renders the injection of a clyster very difficult. But it appears that all the painful symptoms are chiefly in consequence of the suppression of urine; for none of those parts which are apt to sympathise in affections or diseases of the *uterus* are disturbed by its retroversion.

The retroversion of the *uterus* has generally occurred about the third month of pregnancy, and sometimes after delivery; it may likewise happen when the *uterus* is, from any cause, enlarged to the size it acquires about the third

month of pregnancy, but not with such facility as in the pregnant state, because the enlargement is then chiefly at the *fundus*. If the *uterus* is but little enlarged, or if it be enlarged beyond a certain size, it cannot well be retroverted; for, in the first case, should the cause of a retroversion exist, the weight at the *fundus* would be wanting to produce it; and in the latter the *uterus* would be raised above the projection of the *sacrum*, and supported by the spine.

The suppression of urine has hitherto been supposed to be the consequence of the retroversion of the *uterus*, which has been ascribed to various accidental causes. But if we consider the manner in which these parts are connected, and examine the effect produced by the inflation of the bladder in the dead subject, so as to resemble the distention brought on by a suppression of urine in the living, we shall be convinced that the *uterus* must be elevated before it can be retroverted*. Now, as there appears to be no cause, besides the distention of the bladder, ca-

* By repeated inflations of the bladder, and then pressing out the air in the dead subject, I could give a very good idea of the retroversion of the *uterus*; and probably, if I could have had an opportunity of making the experiment in a state of pregnancy, I might have succeeded in producing an actual retroversion.

pable of elevating, and at the same time projecting the *fundus* of the *uterus* backwards; and as such elevation and projection necessarily follow the distention of the bladder, it is more reasonable to conclude that the suppression of urine precedes the retroversion, if we do not allow it to be a cause without which the retroversion cannot exist. Moreover, if the *uterus* is in a state which permits it to be retroverted, when the bladder is much distended, a retroversion is a necessary consequence. If a woman, for instance, about the third month of her pregnancy, has a suppression of urine continuing for a certain time, we may be assured that the *uterus* is retroverted.

It would be vain and absurd to contend for the opinion, that the suppression of urine is the cause of the retroversion of the *uterus*; for, were it not just, it would be contradicted by daily experience. But the matter no longer rests upon the foundation of opinion or conjecture: for, from the first case in which I thought I had reason to suspect it, I have so constantly observed it, either by the reserve of women of superior rank in life, or by the restraint of those in inferior situations, neglecting or being prevented from attending to the calls of nature, that there does not remain a

doubt concerning it. The fact hath also been proved in a variety of cases by practitioners of the first eminence, who have supplied me with the most unquestionable testimonies of its truth; and, in this case, it is a matter of great importance to discover the cause of the disease, as the method of preventing it is thereby immediately pointed out.

But the preceding suppression of urine may be overlooked, as there is not occasion for it to be of long continuance in order to produce its effect; especially in a woman who hath a capacious *pelvis*, in whom the retroversion of the *uterus* is most likely to happen. It must also be observed, though the suppression of urine gives to the *uterus* its first inclination to retrovert, yet the position of the *os uteri* is such, in the act of retroverting, and the tumour formed by the *fundus* is sometimes so large, when actually retroverted, as to become, in their turn, causes of the continuance of the suppression of urine.

Should any doubt remain of the cause of the retroversion, it cannot, however, be disputed but that all attempts to restore the *uterus* to its natural position, before the distention of the bladder is removed, must be fruitless, as the *uterus* will be borne down by the pressure of the superincumbent

incumbent bladder. The first step to be taken for the relief of the patient, is to discharge the urine; yet there is always great difficulty in the introduction of the common catheter, because the *urethra* is elongated, altered in its direction, and pressed against the *ossa pubis* by the tumour formed by the retroverted *uterus*. But the inconveniencies thence arising may be avoided by the use of the flexible male catheter, slowly conducted. I say slowly, because, whatever catheter is used, the success of the operation, and the ease and safety of the patient, very much depend upon this circumstance; for if we affect to perform it with haste and dexterity, or strive to overcome the difficulty by force, we shall be foiled in the attempt, or it will be scarcely possible to avoid doing injury to the parts. The catheter should not be carried farther into the bladder, when the urine begins to flow, unless it ceases before the distention is removed; which, in some cases, happens in such a manner as to give us the idea of a bladder divided into two cavities. External pressure upon the *abdomen* will also favour the discharge of the urine, after which the patient is sensible of such relief as to conclude that she is wholly freed from her disease. A clyster should then be injected, and repeated if necessary, to re-

move the *fæces* which may have been detained in the *rectum* before or during the continuance of the retroversion.

But though the distention of the bladder is removed by the discharge of the urine, and all the symptoms occasioned by it relieved, the *uterus* continues retroverted. It has been said that the state of retroversion was injurious to the *uterus* itself, and would produce some dangerous disease in the part: it has also been asserted that, if the *uterus* was permitted to remain in that state, it would be locked in the *pelvis* by the gradual enlargement of the *ovum*, in such a manner as to render its reposition impracticable, and the death of the patient an inevitable consequence. On the ground of these opinions we have been taught that it is necessary to make attempts to restore the *uterus* to its natural situation, with all expedition, when the urine is discharged, and that we are to persevere in these attempts till we succeed. In case of failure, the means we have been advised to pursue, many of which are severe, and some extremely cruel, as well as useless, would best describe the dread of those consequences which have been apprehended from the retroversion.

For both these consequences there cannot surely be reason to fear. If the *uterus* be injured, there

there will be no farther growth of the *ovum*; and if the *ovum* should continue to grow, it is the most infallible proof that the *uterus* has not received any material injury. But it is remarkable that, in the most deplorable cases of the retroversion of the *uterus*, those which have terminated fatally, the death of the patient has been discovered to be owing to the injury done to the bladder only. It is yet more remarkable, in the multiplicity of cases of this kind which have occurred, many of which have been under the care of practitioners who had no suspicion that the *uterus* could be retroverted, and who would of course make no attempts to replace it, that there should be so few instances of any injury whatever. Yet every patient under these circumstances must have died, if their safety had depended upon the restoration of the *uterus* to its proper situation by art; attention having only been paid to the most obvious and urgent symptom, the suppression of urine, and to the removal of the mischief which might thence arise.

Opinions are often vain and deceitful; but, with respect to the matter now under consideration, they have also been very prejudicial: for it has been proved in a variety of cases, many of which were attended to with particular care by

unprejudiced and very capable witnesses, that the *uterus* may remain in a retroverted state for many days or weeks, without any other detriment than what may be occasioned by the temporary interruption of the discharges by stool or urine. And, contrary to all expectation, it hath been moreover proved, that the *uterus*, when retroverted, will often be gradually, and sometimes suddenly, restored to its position without any assistance, provided the cause be removed by the occasional use of the catheter. It appears that the enlargement of the *uterus*, from the increase of the *ovum*, is so far from obstructing the ascent of the *fundus*, that it contributes to promote the effect, the distention of the *cervix* becoming a balance to counteract the depression of the *fundus*; for I have found no cases of the retroverted *uterus* admit of a reposition with such difficulty as in women who were not pregnant.

Allowing that we have the power of returning the *uterus* when retroverted to its proper situation; knowing also that it may continue retroverted without any immediate ill consequences; and presuming that it is capable of recovering its situation by the gradual exertion of its own power, at least that such recovery is an event which follows the change which the parts naturally

naturally undergo ; it is necessary to consider the advantages and disadvantages which may result from our acting according to either intention.

If the attempt to replace the *uterus* be instantly made after the urine is discharged, so much force will often be required for the purpose as will, notwithstanding all precaution, give much pain, induce the hazard of injuring the *uterus*, and often occasion abortion ; which, in some instances, is also said to have happened when little force was used, and even when the *uterus* was actually retroverted. It must likewise be granted that, in some cases, by passing two or more fingers into the *vagina*, the *fundus* of the *uterus* may be raised beyond the projection of the *sacrum* without much force ; though, in others, repeated attempts, with various contrivances, and with the patient at the same time placed in the most favourable positions, have failed to procure success.

If, on the contrary, we are persuaded that the *uterus* will sustain no injury by its retroversion, and that there is no danger of its being locked in the *pelvis*, but that it will be gradually restored to its natural position without assistance, we have then only to guard against those inconveniences which may be occasioned by the distention of, or the pressure made by the bladder and
rectum.

rectum. By the former of these we shall be reduced to the necessity of using the catheter daily or frequently, which is generally done without difficulty, except the first time it is introduced. This operation, it must be acknowledged, is, in all cases, very disagreeable and troublesome to the patient; and, in some situations, the necessity we are under of performing it so often, and for so long a time, is in itself a sufficient reason for our attempting to replace the *uterus* speedily. But the suppression of urine does not always remain through the continuance of the retroversion of the *uterus*: for, when the distention of the bladder has been removed for some days, and its power of action restored, the patient will often be able to void her urine without assistance.

We may then bring the matter to this issue: if the *uterus*, when retroverted, can be replaced by art, without the exertion of much force, or the risk of mischief, the immediate reposition, though not absolutely necessary, is at all times an event to be wished; as farther apprehension and trouble are prevented, the safety of the patient ensured, and her mind quieted. But, when the *uterus* cannot be replaced without violence, it seems more justifiable to wait for its return, and to satisfy ourselves with watching and relieving

lieving the inconveniences produced by the retroversion. We shall also find that, the longer the attempt to replace the *uterus* is delayed, the more easy the operation will ultimately be, and the success more certain.

To those who have been accustomed to consider the retroversion of the *uterus* as productive of immediate and urgent danger, it may seem strange to assert that, when the urine is discharged, the patients are often able to return to the common business of life without danger, and with very little trouble, if no essential injury has been done to the bladder by the greatness or long continuance of the distention. I do not mean that they will be as perfectly easy as if the *uterus* was not retroverted; but the inconveniences they may suffer will be trifling and of short duration, compared with those which might arise from violent attempts to replace it.

I shall conclude these remarks with an observation which will appear extraordinary. From the time when the first accounts of the retroversion of the *uterus* were given in this country, till within these few years, it was esteemed to be a case of great danger, and to require the most delicate management; but, at the present time, no practitioner of credit considers it as a case of
any

any difficulty, or feels any solicitude for the event, provided he be called to the relief of the patient before any mischief is actually done*.

SECTION II.

ANOTHER complaint similar to that of which we have been speaking, and which has been called a retroflection of the *uterus*, has occurred in practice. By this term is implied such an alteration in the position of the parts of the *uterus*, that the *fundus* is turned downwards and backwards between the *rectum* and *vagina*, whilst the *os uteri* remains in its natural situation; an alteration which can only be produced by the curvature or bending of the *uterus* in the middle, and in one particular state; that is, before it is properly contracted when a woman has been delivered.

A suppression of urine existing at the time of delivery, and continuing unrelieved afterwards,

* See Medical Observations and Inquiries, Vol. IV. and subsequent volumes.

was the cause of the retroflexion of the *uterus* in the single case of this kind of which I have been informed by Dr. *Thomas Cooper*; and the symptoms were like those which are occasioned by the retroversion.

When the urine was discharged by the catheter, which was introduced without difficulty, the *fundus* of the *uterus* was easily replaced by raising it above the projection of the *sacrum*, in the manner advised in the retroversion.

SECTION III.

THAT affection of the *vagina* and *perinæum* which I have termed the *hydrocele*, or dropfy of the *perinæum*, is not an original disease, but a symptom of the *ascites*, occasioned by the pressure of the water contained in the cavity of the *abdomen*, upon the inflected part of the *peritonæum* between the *vagina* and *rectum*. The former, having no support from the adjoining parts, and being unable to sustain the weight of the water which rests upon it, after a certain time, begins to yield; and the pressure being continued or increased,

creased, the posterior part of the *vagina* is distended, pushed down, and at length protruded through the external parts, in such a manner as to invert the *perinæum*. A tumour is then formed at the *pudendum*, of which the *vagina* is the external coat, and the *peritonæum* the internal. This appearance occurs too rarely, or the instances recorded are too few, to justify the establishment of any general mode of practice; but, by the history of the following case, we may be enabled to make a distinction of this particular tumour, and of the method of treatment which it may sometimes be requisite and advisable to pursue.

In the year 1772 I attended a patient who was then pregnant of her sixth child. She had a slight cough, some difficulty in breathing, and an obtuse pain in her right side. Her eyes had a yellow tinge, and she had an uneasy sensation as if her stomach was swelled. Her urine, which was voided in small quantities, was high-coloured, and deposited a red sediment. Her pulse was quick, she had a constant thirst, and very little appetite. She reckoned that she was in the seventh month of her pregnancy.

Six ounces of blood were taken from the arm, a saline draught was given, with a few grains of
rhubarb,

rhubarb, twice daily or occasionally. She was advised to drink whey or ground-ivy tea with milk, and sweetened with honey for her common drink, to live chiefly upon fruit and vegetables, and to go into the country. There she resided near two months, during which time little alteration was made in her diet or medicines; but the *abdomen* was distended to an unusually large size. She then returned to her family in town in daily expectation of being delivered.

In the course of my attendance she had often mentioned a complaint which was very troublesome, and occasioned great solicitude. This, from her description, I considered as a *prolapsus* of the *uterus*; and, expressing a desire to be more particularly informed, she permitted me to examine it.

I was surprised to find a tumour of the size, and somewhat of the form, of an inflated calf's bladder, rising from the *perinæum* internally, passing forwards and outwards, so as perfectly to occlude the entrance into the *vagina*. By pressure the tumour lessened, and by a continuance of the pressure it entirely disappeared, leaving a loose pouch within, and on the back part of the *vagina*. When she stood up the tumour returned to its former size and situation; but when she lay

lay down, and the pressure was renewed, it again disappeared. It had not the feel of *omentum* or intestine, but clearly contained a fluid which must communicate with some other cavity. I afterwards examined the *abdomen*, and could readily perceive a fluctuation in it. A doubt then arose whether she was with child; but, by an examination *per vaginam*, I could discover the head of a small child resting upon the *pubis*.

The peculiarity of this tumour, its recession when pressed, and its return when the pressure was removed and the patient stood upright, together with the assurance of there being water contained in the cavity of the *abdomen*, were presumptive proofs that there must be a communication between the tumour and that cavity; and this communication could not be explained so satisfactorily as by supposing that the water had insinuated itself between the *vagina* and *rectum*, and, by resting upon, had at length protruded the posterior part of the *vagina*.

If this opinion was just, it might yet be debated, what was the most reasonable method to be pursued for the relief of the patient; or whether it would not be more prudent to defer all attempts till she was delivered. Several gentlemen of the first eminence in the profession were consulted

consulted upon the occasion, and it was agreed that we should wait till she was delivered.

About three weeks after this time her labour came on. The child being small, and presenting naturally, it was soon expelled, the tumour yielding gradually to the pressure of the head of the child; though it appeared that the expulsion was completed by the action of the *uterus* only, the abdominal muscles being too much distended to contribute any assistance. The *placenta* came away with great ease, and she had no complaint till the fourth day after her delivery, when, after a few loose stools, her strength failed, and she expired.

After her death I was very desirous of knowing the truth of the opinion which had been entertained concerning her case; but her friends would not consent that the body should be opened. They however permitted me to examine the tumour. A trocar being pushed into it, upwards of a quart of water was immediately discharged. The water then came away more slowly; but I observed that the *abdomen* subsided in proportion to the water discharged through the *canula* of the trocar.

Mr. *Watson*, a surgeon of great experience and ability, who saw this patient, informed me

L that

that he had met with a similar case in a woman who was not pregnant. He tapped the tumour with a small trocar, and left the *canula* remaining in the orifice for several days. The water continued to drain away till the *abdomen* was perfectly empty. This woman recovered, and had no return of the dropfy.

SECTION IV.

By the descent of the intestines, or *omentum*, between the *uterus* and *rectum* is constituted a particular kind of *hernia*, of which the cases recorded are very few *. The inconveniencies thence arising will depend upon the bulk of the tumour formed and the compression which the parts thus situated may undergo. The methods by which relief is to be obtained by art will immediately occur to every practitioner, as they consist in making all prudent and reasonable attempts to replace the disordered parts, and keeping them in their proper situation when replaced.

* Elytrocele. *Vogel*. cccii. Hernia in vagina uteri eminens.

It is happy for the patient that no immediate bad consequences are likely to follow this complaint, though, under particular circumstances, it may prove fatal, as in the following case, which was communicated to me by Dr. *Maclaurin*.

A servant in a gentleman's family, in a state of perfect health, was suddenly seized with all the symptoms of a strangulated *hernia*, though, from the most accurate inquiry and examination, it did not appear that she then, or at any preceding time, had a *hernia*. All the means used for her relief were ineffectual, and she died on the third day of her illness. Leave being obtained to inspect the body, a considerable portion of intestine was found lying between the *uterus* and *rectum*, in a gangrenous state; and it was confined and compressed in this situation by a membranous bridle, which passed from the *fundus* of the *uterus* to the opposite part of the *rectum*.

CHAPTER IV.

SECTION I.

ON MENSTRUATION.

FROM the *uterus* of every healthy woman who is not pregnant, or who does not give suck, there is a discharge of blood, at certain periods, from the time of puberty to the approach of old age; and, from the periods or returns of this discharge, it is called Menstruation.

There are several exceptions to this definition. It is said that some women never menstruate, their constitutions or structure not requiring this discharge. Some menstruate while they continue to give suck, and others are said to menstruate during pregnancy; but of this I have never known an example. Some are said to menstruate in early infancy, and others in old age; but such discharges may, I believe, with more propriety, be called morbid, or symptomatic. There are also many varieties with respect to the periods and appearance of the discharge, from permanent
causes

causes or accidental influences; but the definition is generally true.

At whatever time of life this discharge comes on a woman is said to be at puberty, though of this it is a consequence, and not a cause. The early or late appearance of the *menfes* may depend upon the climate, the constitution, the delicacy or hardiness of living, and upon the manners of those with whom young women converse. There seems to be an analogy between the effect of heat upon fruits and the female constitution, with respect to menstruation, for the warmer the climate the sooner the *menfes* appear. In *Greece*, and other hot countries, girls begin to menstruate at eight, nine, and ten years of age; but advancing to the northern climes, there is a gradual protraction of the time till we come to *Lapland*, where women do not menstruate till they arrive at maturer age, and then in small quantities, at long intervals, and sometimes only in the summer*. But, if they do not menstruate according to the genius of the country, they suffer equal inconveniencies as in warmer climates, where the quantity discharged is much greater, and the periods shorter. In this country girls begin to

* *Linnaei Flora Lapponica*; under the article *Musculus*.

menstruate from the fourteenth to the eighteenth year of their age, and sometimes at a later period, without any signs of disease; but if they are luxuriously educated, sleeping upon down beds, and sitting in hot rooms, menstruation commences at a more early period.

Many changes in the constitution and appearance of women are produced at the time of their first beginning to menstruate. Their complexion is improved, their countenance is more expressive and animated, their attitudes graceful, and their conversation more intelligent and agreeable; the tone of their voice becomes more harmonious, their whole frame, but particularly their breasts, are expanded and enlarged, and their minds are no longer engaged in childish pursuits and amusements*.

The difference in the time of life when the *menfes* appear has been assigned as the reason why women, in hot climates, are almost universally treated as slaves, and why their influence is so powerful and extensive in cold countries,

* Nec minus notum est, quanta virgini alteratio contingat, incremente primum et tepesfacto utero; pubescit nempe, coloratior evadit, mammæ protuberant, pulchrior vultus renidet, splendent oculi, vox canora, incessus, gestus, sermo, omnia decora fiunt.—*Harv. Exercitat. de Partu.*

where personal beauty is in less estimation *. In hot climates women are in the prime of their beauty when they are children in understanding; and when their understanding is matured, they are no longer the objects of love. In cold climates their persons and their minds acquire perfection at the same time; and the united power of their beauty and faculties is irresistible.

Some girls begin to menstruate without any preceding indisposition, but there are generally appearances or symptoms which indicate the change that is about to take place. These are usually more severe at the first than in the succeeding periods, and they are similar to those produced by uterine irritation from other causes; as pains in the back and inferior extremities, complaints of the *viscera*, with various hysteric and nervous affections. These commence with the first disposition to menstruate †, and continue till the discharge comes on, when they abate or disappear; returning, however, in some women, at every period during life.

* *David Hume*; but I do not remember in what part of his works.

† *Ante menses constanter satis, humor serosus albicans effluit, etiam aliquot mensibus priusquam sanguis sequatur.* — *Haller. Physiolog.*

The quantity of blood discharged at each evacuation depends upon the climate and constitution, and it varies in different women in the same climate, or in the same women at different periods. But there is a common quantity to which, under the like circumstances, women approach, and it may be estimated in this manner. Supposing the quantity to be about eighteen ounces in *Greece*, and two ounces in *Lapland*, there will be a gradual alteration between the two extremes, and in this country it will amount to about six ounces.

There is also a great difference in the time required for the completion of each period of menstruation. In some women the discharge returns precisely to a day or an hour, and in others there is a variation of several days. In some it is finished in a few hours, and in others it continues from one to ten days; but the intermediate time, from three to six days, is the most usual.

There has been an opinion, probably derived from the Jewish legislator and the Arabian physicians, that the menstruous blood possessed some peculiar malignant properties. The regulations which have been made, in some countries, for the conduct of women at the time of menstruation, the expressions used, the disposal
of

of the blood discharged, the complaints of women attributed to its retention, and the effects enumerated by grave writers, indicate the most dreadful apprehensions of its baneful influence. Under peculiar circumstances of health, or states of the *uterus*, or in hot climates, if the evacuation is slowly made, the menstruous blood may become more acrimonious or offensive; but in this country and age, no malignity is suspected; the menstruous woman mixes in society as at all other times; and there is no reason for thinking otherwise than that this discharge is of the most inoffensive nature*.

At the approach of old age women cease to menstruate, but the time of the cessation is commonly regulated by the original early or late appearance of the *menfes*. Those who began to menstruate at ten or twelve years of age will

* Penis cum menstruata concumbentis excoriatur, si novella vitis eo tangatur, in perpetuum læditur, steriles fiunt tactæ fruges, moriuntur insita, exuruntur hortorum germina; si mulier prægnans alterius menstrua supergrediatur, aut illis circumlinatur, abortum facit; ei autem quæ uterum non gestat, concipiendi spem adimit; purgantis spiritus et vapor ab ore, specula atque eboris nitorem obscurat: gustatus hic sanguis canes in rabiem agit, homines vero diris cruciatibus affligit, comitiales morbum, pilorum effluvium, aliaque elephantorum vitia: idcirco a veteribus inter venena relatus; pari malignitate existimatur, atque sanguinis elephantici potus. — *De Graaf*, p. cxxiv.

often

often cease before they arrive at forty; but if the first appearance was protracted to sixteen or eighteen years of age, independently of disease, such women may continue to menstruate till they have passed the fiftieth, or even approach the sixtieth year of their age. But, in this country, the most frequent time of the cessation of the *menfes* is between the forty-fourth and forty-eighth year, after which women never bear children. By this constitutional regulation of the *menfes* the propagation of the species is, in every country, confined to the most vigorous part of life; had it been otherwise children might have become parents, and old women might have had children, when they were unable to supply them with nourishment.

When women are deprived of the common uterine discharge, they are sometimes liable to periodical emissions of blood from the nose, lungs, ears, eyes, breasts, navel, and almost every other part of the body *. These have been deemed as deviations of the *menfes*, and communicated with the most scrupulous exactness, as if some great

* Illa (menstrua) per vomitum, alvum, urinam, per oculos, nares, aures, gingivas, mammas, umbilicum, minimum manus digitum, ac alias insuetas corporis partes interdum promanare.—
De Graaf, pag. cxxix.

advantage was to be obtained by our knowledge of them. But the propriety of considering them in this point of view seems very doubtful, and I suspect that they generally ought rather to be esteemed as discharges belonging to some disease under which the patient may labour, or to the state she is in; and that they often proceed from causes totally independent of those of menstruation, as hemorrhages of every kind, in either sex, are frequently observed to be periodical.

Some men have also had a periodical discharge of blood from various parts of the body, but generally from the hemorrhoidal vessels. We might suppose that such constitutions resembled those of women, though the essential peculiarity cannot be discovered.

SECTION II.

THE causes of menstruation have been divided into efficient and final, and though little has been said upon this subject which is likely to procure any practical advantage, sufficient attention has been paid both to the discovery of the cause and end of menstruation; and, where our senses have failed

failed to procure evidence, the imagination hath been called to their aid. To unsophisticated observation, and to a mere relation of facts, or the inferences plainly to be deduced from them, men are unwilling to submit, as the powers of the imagination are by such proceeding checked or suppressed, and the parade of learning is lost. Hence a multitude of opinions are formed and transferred by the writers of one age to be controverted by those of the next; and we are amused or perplexed, but not instructed. Of this truth there will not be a doubt, if we consider for a moment the number of opinions which have devolved upon us, with respect to menstruation and conception; the fallacy of which it would be the business of one man's life to confute. But, though we are not to be immersed in such inquiries, a cursory view of what has been said of the causes of menstruation seems necessary, to preserve the unity, as it may be called, even of a practical discourse.

It has been said, after *Aristotle*, that the fluids of the human body were, like the ocean, influenced according to the phases of the moon, and that menstruation was similar to the tides. This discharge has been attributed to a *plethora* of the constitution, or of the *uterus*; to a ferment generated

nerated in the *uterus*; or to some humour of the constitution, as the bile*, producing this specific effect upon the *uterus*. The discharge has been asserted, by some, to come from the veins of the *uterus*; by others from the arteries; and by others it is said to be poured from cavities or receptacles in the substance of the *uterus*, calculated to contain a certain quantity of blood, as it was gradually collected. Some have presumed that it was a simple discharge of blood, others that it was a secretion; some that it was a constitutional discharge, and others that it was merely local.

That menstruation is not occasioned by the moon, or any general physical cause, is evident from the circumstance of women menstruating at every moment of its increase or decline; and if this reason was admitted, it would prove that men and animals should also menstruate. It is not probably occasioned by *plethora*, as the loss of several times the quantity of blood discharged in menstruation, from the arm, or any other part of the body, does not prevent or interrupt the flowing of the *menfes*; and in those complaints which arise from obstructions of the *menfes*, greater relief is afforded by a few drops of blood

* *Charlton—Drake.*

from the *uterus* itself, than by ten times the quantity from any other part. There seems to be no reason for the opinion of any fermenting principle being the efficient cause of menstruation, no part of the *ut rus* appearing fitted for its secretion or reception ; and the opinion of bile acting with any peculiar influence upon the *uterus* was assumed, because of the resemblance between the symptoms arising from an excess or defect of bile, and those depending on menstruation ; together with the influence which those of bilious constitutions feel at the time of menstruation. But this reason, like some of the former, would prove too much for the intended purpose, if it was admitted.

Among the early cultivators of anatomy, it seems to have been thought of great importance to decide from what vessels the menstruous blood was discharged, some contending that it was from veins*, and others strenuously maintaining that it was from arteries † ; the opinion of there be-

* Ex venis uterum petentibus, menstruas purgationes evacuari indubitatum est, at quomodo id fiat, et per quas potissimum venas, &c. ambigas.—*Vesalius*, lib. v. cap. xv.

† Sanguis exit de corpore per dilatatas rectas arterias naturaliter, in menstruorum excretionem, in fœminis.—*Ruyseh. Epistola ad Boerhaavium*.

ing receptacles in the *uterus* for its collection is of a modern date*. This latter cannot be true, as, from the examination of the *uteri* of women, at every intermediate period, such receptacles could not have been overlooked if they had existed. From the appearance of the menstruous blood in a healthy woman, and from that of the vessels by which it is discharged, which run in a tortuous manner during the act of menstruation, many have not hesitated to pronounce it arterial.

The menstruous discharge has commonly been considered simply as blood, though of a different kind from the general mass, as it has been observed not to coagulate†. All discharges of blood, in which there were *coagula*, have therefore been distinguished from menstruation, and assigned to some other cause. Whether menstruation ought to be esteemed a secretion similar to that made by other glands of the body, and does not coagulate because it is essentially different from blood, which I believe; whether the coagulation is prevented by a mixture with the discharge from the mucous glands; or whether it is a secretion from the *uterus* peculiar to that part, without analogy

* System of the Womb.—*Simson*.

† *Haller* has quoted *Dionis* for this observation, but I could not find it in any part of his works.

or resemblance to that of any other part, may be proved by future observations and experiments.

The various opinions of menstruation being a local or a constitutional discharge, may continue to be supported by those who think them of consequence. Every discharge is local, though its effect must be constitutional; but it does not appear that the symptoms of the suppression of the *menfes* supply a stronger argument in favour of the latter opinion, than the regurgitation of bile upon the skin, or its discharge by urine when the natural passage is obstructed.

SECTION III.

NUMEROUS as the opinions have been of the efficient cause of menstruation, two only have been entertained of its final cause; first, that it was designed to preserve the *uterus* in a state fit for conception; secondly, that this blood, being more in quantity than was necessary for the ordinary purposes of the constitution, became, during the state of pregnancy, nourishment for the *fetus*, without any reduction of the strength of the parent.

The first of these opinions, I believe, is not controverted, observation having fully proved that women who do not menstruate from the *uterus*, or who are not in a state disposed to menstruate, cannot conceive; even though they should have a periodical discharge of blood from any other part of the body. Hence we may conclude, whether menstruation be necessary for the constitution of a woman or not, that it is a circumstance on which the due and healthy state of the *uterus* very much depends. It has also been observed that all animals, at the time of their being salacious, or in a state fit for the propagation of the species, have a discharge equivalent to menstruation, which is generally mucous; but, in some instances, seasons, and climates, becomes, in the greater number of them, sanguineous.

Of the truth of the opinion, that the menstruous blood contributes to the formation or nutriment of the *fetus*, there is much reason to doubt. The former seems to have been founded on the observation that women who did not menstruate could not conceive; and this, if carried to its full extent, might have led to another conclusion, that the time of menstruation was most favourable to conception; which is allowed not to be just. And as to the share which the menstruous blood might have in the nourish-

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ment of the *fœtus*, as all animals, whether menstruating or not, supply their conception with nourishment of a proper kind, and in a sufficient quantity to bring them to perfection, we may be permitted to conclude that it is by some common principle. If there had been a gradual abatement of the discharge, in proportion to the increase of the *fœtus*, its nourishment might have been presumed to be one of the final causes of menstruation. But, as there is an instant and a total suppression of the *menfes* when a woman has conceived, they must either be superfluous in the early, or deficient in the advanced state of pregnancy.

The mucous discharge from the *uteri* of animals proves that they are in a state favourable to the propagation of their species; and the menstruous discharge is a proof of the same in women, as far as the *uterus* is concerned. For the reason of this difference we are to search in the structure of the *uteri* of the different classes of animals. The desire of procreation exists in animals only at certain seasons of the year; by these it is regulated in such a manner, that the offspring will be produced at the time when they are likely to suffer the least injury from the climate in which they are to live, so that it is accommodated

commodated to every climate; unless the genuine nature of the animal be changed by luxurious treatment, or by defect of nourishment. Women, on the contrary, having every month that discharge which proves them capable of conceiving, propagate their species at every season of the year, and the gratification of the attendant desire, when enjoyed with prudence, may be esteemed a peculiar indulgence granted by Providence to mankind.

SECTION IV.

ALL women have an opinion that menstruation is to them a cause of diseases from which men are exempt; and their apprehensions of danger are chiefly confined to the times of the first appearance, and of the final cessation of the *menfes*. It is not proved that more women suffer at the time of puberty than men, though there may be some difference in their diseases; nor is it decided that those diseases, which occur at the time of the final cessation of the *menfes*, are more frequent or more dangerous than those to which men are liable at an equivalent age. Some advantage

seems to be derived to women from their capacity to menstruate, especially to those whose constitutions or particular situations require discharges of blood for their relief; for such, at all periods of life, are usually made with great facility from the vessels of the *uterus*; whereas, in men, these evacuations often happen from parts which sustain much consequent injury. The circumstances attending menstruation are, however, sometimes such as to require medical assistance, and these I shall consider in the following order; first, obstruction of the *menfes*; secondly, excess of the *menfes*; thirdly, painful menstruation; and then I shall speak of the treatment which may be proper at the time of the final cessation of the *menfes*.

By the term obstruction is properly understood the defect or failure of the appearance of the *menfes*, at a time of life when they might be expected; and by suppression, a total stoppage of the menstruous discharge which has before appeared*. But the terms are indiscriminately used.

* Chlorosis. *Cullen*. G. xlv. Dyspepsia, vel rei non esculentæ desiderium, cutis pallor vel decoloratio, venæ minus plenæ, corporis tumor mollis, asthenia, palpitatio, menstruorum sæpe retentio.

Amenorrhæa. *Cullen*, cix. Menses suppressio.

These have generally been esteemed original diseases, producing many troublesome, and sometimes dangerous consequences ; but the moderns have, with more propriety, considered them as symptoms of some disease with which the constitution was primarily affected. But, in some cases, the suppression of the *menfes* seems to be an original affection, often, though not universally, succeeded by a certain train of untoward symptoms ; for it appears, in some women, to be a simple interruption of the discharge, not necessary for the constitution at some particular time. The precise reason of this temporary suppression it would be difficult to investigate ; but I have observed it to happen, together with a wasting of the breasts, in very chaste women, who have been under the necessity of living separate from their husbands,

As very different diseases may become causes of the suppression of the *menfes*, and as this may in different constitutions produce very opposite effects, it is not extraordinary that we should find those symptoms, which have been described as attendant on the suppression of the *menfes*, so numerous and so unlike. But the two principal distinctions are to be made from the appearance of the patients, some of whom have a pale leuco-

phlegmatic look, with every consequence and indication of want of power and energy in the constitution, and a fulness of vapid fluids; but others have a florid complexion, with signs of a hectic disposition. To either of these states may be joined all the various symptoms which arise from uterine disturbance.

In the obstruction of the *menfes*, with a pale complexion, a variety of medicines have been given, which were supposed to possess the properties of immediately influencing the *uterus*, and of promoting the menstruous discharge by some specific operation. But speculative differences have been lost in the uniformity of practice; for those who have differed widely in their theories of menstruation, and in their opinions of the operation of the medicines prescribed, have agreed as to the individual medicines which they recommended; and it was of no importance to the patient whether the effect was produced by some specific operation, or was secondary to an alteration made upon the constitution. Every medicine which has the power of strengthening or invigorating the habit, bitters, aromatics, and preparations of iron, become eventually promoters of the menstruous discharge. But, previous to their use, it will, in general, be necessary to give a
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gentle emetic and laxative medicines, for the purpose of freeing the constitution from the load of inactive fluids, and of cleansing the *primæ viæ*, by which the operation of such medicines will be rendered more effectual. Of these, the preparations of iron are supposed to be the most powerful and best adapted to the case; and they may be given in a variety of forms and quantities, alone or joined with bitters and aromatics, provided the patient has no fever. In some cases tepid bathing, or *pediluvia*, are of service; and in others bathing in the sea: and I have observed that the guides to the ladies continue to go into the water, during the time of menstruation, without any inconvenience.

Medicines of this class do not always produce the menstruous discharge, or its return, though they scarce ever fail to improve the health. In the constitutions of some women there is an idiosyncrasy which withstands the effect of such medicines as are generally found to answer certain intentions; and yet the same end may be gained by some other medicine, in general less efficacious. Different preparations of quicksilver have sometimes been given with advantage. The root of madder has been advised, either in one or more large doses, about the time when the *menfes*

are expected, or to the quantity of half a dram twice or three times daily in the intervals*. Repeated emetics, which are supposed to operate, not by cleansing the *primæ viæ* only, but by agitating and calling forth the powers of the constitution to more vigorous action, are sometimes successfully used. Electricity, directed to the region of the *uterus* and *ovaria*, has lately been practised and recommended by men of reputation; and often, I believe, with success.

In the suppression of the *menfes*, with a pale complexion, the diet should be generous, and wine may be allowed. Exercise of every kind is proper; but it ought not to be greater than the patient can bear without fatigue. She may often be invited by dancing or riding on horseback, and these seem best adapted to her complaint.

The suppression of the *menfes*, with a florid complexion, is usually combined with symptoms very different from those which occur when it is pale, and a method of treatment reverse to the former is required; for the colour of the cheeks is, in these cases, the flush of disease, and not the glow of health. Such patients have usually

* See *Riverius*, and, before him, *Sennertus*.

a slight cough, pains in the breast, some difficulty in breathing, fever, and other signs of a consumptive tendency. In such situations, instead of pursuing the former intention, with the view of producing or promoting the menstruous discharge, we must regard the disease, and endeavour to give relief by repeated bleeding in small quantities, by antiphlogistic and emollient medicines, by a vegetable diet, and by repose, forbidding all exercise but that of the most easy kind, and then the suppression of the *menfes* may come under contemplation. The *tinctura Melampodii* has been strongly recommended; but the principal good which it does seems to be produced by its operation as a gentle laxative.

The *menfes* are sometimes suppressed by sudden exposure to cold, or by violent exercise and agitation during the time they are flowing. Even in these cases the suppression is subsequent to the attack of some disease; as a pleurisy, peripneumony, acute rheumatism, or the like; and under such circumstances the same treatment is to be advised as the particular nature of the disease may require, without regard to the *menfes**.

* I have been informed that, in suppressions or deviations of the *menfes*, injections *per vaginam*, in the composition of which there is some preparation of quicksilver, are of particular service; but of such I have not had any experience.

SECTION V.

THE excess or profusion of the menstruous discharge may be of two kinds*. It may consist either in the frequency of its return, or the superfluity of its quantity at each period; and the causes assigned for either of these are, too great fulness of the constitution, or the thin and acrimonious state of the blood; together with external accidents. Instances occur in practice in which women menstruate at each period a larger quantity than their constitutions are able to afford; yet those cases, which are usually reduced under the term profusion of the *menfes*, are very rare; what are called such being either hemorrhages accompanying early abortions, or morbid or symptomatic discharges from the *uterus*. The symptoms of the profusion of the *menfes* are the same as those which are produced by hemorrhages from any other part of the body, with some peculiar to affections of the *uterus*.

* Menorrhagia.—Cullen, G. xxxvii. Dorſi, lumborum, ventris, parturientium inſtar dolores; menſtruorum copioſior, vel ſanguinis e vagina præter ordinem fluxus.

If there should be merely too large a quantity of menstruous discharge at each period, or too frequent returns, such medicines and regimen as strengthen the constitution or amend the health will be proper; and when these complaints can be supposed to arise from the want of a due degree of contractibility in the blood vessels, gentle emetics, occasionally repeated, have been of great service. However, in far the greater number of cases of this kind which occur in practice, the discharge seems to be symptomatic, and dependant on the general feverish state of the patient, or that of the *uterus* in particular. For, if astringent or strengthening medicines are given in the first instance, they are so far from removing the complaint, that they increase it; but, if the feverish disposition be previously abated by bleeding and a proper regimen, such medicines may then be given with propriety and advantage. In discharges of blood from the *uterus*, proceeding from diseases of the part, the treatment must depend upon the nature of the disease.

SECTION VI.

THE pain with which some women menstruate at each period, is sufficient, from its violence and duration, to render a great part of their lives miserable*. Healthy, robust women, or those in whom the process is speedily concluded, suffer very little at that time; the pain is therefore to be attributed to an increased degree of irritability in the habit, or to the difficulty with which those vessels, designed for the menstruous discharge, become permeable. It is in general moderated, and sometimes altogether removed, by the use of such means as lessen uterine irritation, or facilitate the discharge. Bleeding in small quantities, gently purgative medicines, and opiates, repeated according to the urgency of the case, may be occasionally directed with advantage. Soaking the feet in warm water, or receiving the steam of it upon the parts principally affected, will often do much service; but no medicine of this kind gives equal relief with the warm bath,

* *Dysmenorrhæa. Vogel. clxx. Profluvium sanguinis uterini menstruum dolorificum.*

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which may be used every evening, when the symptoms preceding menstruation come on, and continued throughout the period. Many medical writers have advised, and it is yet a popular custom, to give medicines of that kind which have been called deobstruent, with the view of promoting the discharge by quickening the action of the parts concerned; and in some constitutions these may be proper: but, as all such medicines disturb and increase the heat of the body, they are generally found, by experience, rather to add to the pain than to contribute to its abatement.

SECTION VII.

At the approach of old age the *menfes* disappear, the constitutions of women neither requiring nor allowing a continuance of the discharge. It was before observed, that this event usually happens about the forty-eighth year of their age, though some instances have occurred of their cessation so early as the thirty-fifth, and

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of their duration to the sixtieth year of the woman's age.

The *menfes* seldom disappear suddenly; but, before their departure, they become irregular in their periods or in the quantity discharged. These irregularities are usually accompanied with disturbances in the constitution, particularly of the *viscera*, and those complaints which are called hysterical.

All women are alarmed at the time of the final cessation of the *menfes*; and are persuaded that the ill consequences which sometimes ensue are to be prevented by proper care and management. But it must be observed, that scarce one of a great number of women suffers more than temporary inconvenience on that account; and it is not reasonable to think that any disease should be a necessary consequence of the cessation of a discharge, which is as perfectly natural as its appearance or continuance. But if there be a disposition to disease in the constitution, especially in the *uterus*, a more rapid progress is made when the *menfes* cease; not because they give existence to, or increase the disease by their qualities, but because the constitution, or the part disposed to disease, is deprived of a local discharge, by which it was relieved.

On the presumption that the *menfes* retained became, by their malignant quality, the cause of diseases, many medical writers have advised aloetic, and other stimulating medicines, which were supposed to possess the power of continuing the discharge a longer time than the natural. As the principle is not just, the practice is also in general very injurious; for I hardly recollect an instance in which such medicines did not do mischief, by increasing all those complaints which were imputed to, because they occurred at the time of, the final cessation of the *menfes*. But the present mode of practice is far more reasonable and successful, it being now usual to bleed occasionally, which women advanced beyond this period generally bear very well, and to give lenient purgatives, avoiding all kinds of medicine and diet which are heating.

It is, however, a well known fact, that the *uterus* is more liable to diseases at the time of the final cessation of the *menfes* than at any other; and that these often terminate either in a scirrhus or cancer, with consequences the most painful and deplorable. We have, at present, no idea of a cancer but that it is an incurable disease, of which there are probably many varieties; and when it affects the *uterus*, besides the general symptoms

symptoms which arise from uterine irritation, or from other causes, there is, together with pain increasing according to the progress of the disease, a serous, ichorous, or bloody discharge, frequently of such an acrimonious quality, as to excoriate the external parts which it may touch, and at length to corrode the bladder and *rectum*; admitting no other relief than what is afforded by *opium*, which has only the power of procuring an imperfect and short insensibility to the tortures of the disease.

For the relief of those who have suffered all the complicated evils of a cancer of the *uterus*, humanity and interest have instigated many practitioners to pay the most serious attention to this disease, with the view of discovering its cause, and some adequate remedy; even the pretensions of empirics have been examined with candour and tried with perseverance. Of course, we have been led to the use of a variety of medicines, of which great expectations of benefit have been entertained; as preparations of quicksilver, of iron, of lead, of antimony, and even of arsenic; all the saline preparations; sarsaparilla, bark, clivers, or goose-tongue; the juice of the water-parsnep, and of a thousand other herbs; but, above all, the hemlock in every form, separate or combined with

other. Baths, fomentations, and injections of every kind, have been applied with many different contrivances. Some of these have evidently accelerated the progress of the disease, and though others have afforded temporary relief, few ingenious men will hesitate to acknowledge, that the good to be expected from any mode of treatment, or medicine hitherto discovered; must be obtained by the relief of the symptoms, rather than the diminution or removal of the disease; and that, in its advanced stage, we may be happy if so much be in our power.

It is remarkable, that the cure of cancers affecting other parts of the body, where applications could be made with the greatest facility and advantage, has not been attempted, when those of the *uterus* have been undertaken with great confidence. This may be among the instances in which the credulity of patients renders them liable to the impositions of empirics. If it be however allowed, that this disease is incurable, and that regular practice despairs of giving assistance, the trials of empiricism, under some restrictions, may not only be permitted but encouraged, with the expectation of some casual good; and if, by the expenditure of money, hope, though of short duration, can be procured, the

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purchase is easy at any rate. But, as by the favour of Providence, and the labours of men, remedies have been discovered for many diseases which were once thought incurable, we may trust that one will at length be found for this most deplorable disease*.

But this eagerness to discover some specific remedy for a cancer, has, in one view, been productive of mischief. Though the essential nature of the cancerous *virus* is unknown, one of its first effects is inflammation, with its concomitant symptoms. As the disposition to inflame may often be removed by bleeding, proper medicines, and a strict diet, the part may be kept in a quiescent state, and the progress of the disease suspended or retarded. For this purpose also, local bleedings, with scarification or leeches on the

* Many years ago, I drew up proposals for the establishment of a house for the reception of cancerous cases only; to be under the direction of a very able physician, surgeon, and apothecary, whose abilities should be wholly exerted for the investigation of the nature of this disease, and for the examination of the effect of the medicines which it might be prudent to try. If such a house should ever be established, the medical attendants ought to receive public salaries, because the professed object would be to gain knowledge; whereas, in other hospitals, the principal object is to relieve the distressed, the acquisition of knowledge being a secondary consideration.

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lower part of the back, or on the thighs, are often useful; and issues have been found, in some cases, to have done much service. But if these means of giving relief are neglected, and we are wholly engaged in the contemplation of an absolute and effectual cure, it appears that we reject a less present advantage which is in our power, for the pursuit of a greater, though distant good, which we may never obtain. It must also be observed, that a very great number of cases have occurred, in which those symptoms which commonly attend a cancer of the *uterus*, and which have been called cancerous, have come on with great rapidity and violence; yet the patient has not only been relieved, but an effectual cure hath been obtained by activity and perseverance in the antiphlogistic treatment.

CHAPTER V.

SECTION I.

ON CONCEPTION.

By the term conception is understood, the formation of an *embryo*, or of the rudiments of a new being, in consequence of the mixture of the male and female *semen*; or of the operation of one or both of these, in or after the act of coition.

It has been much disputed whether conception be merely an assemblage of small particles already prepared, and constituent of the kind; or first a change, and then a coaptation of particles designed for that purpose. But the first part of the process by which primordial existence is established, by the minuteness and complication of the objects to be described, and by the retirement of the attending circumstances, is probably involved in too much obscurity to be discovered by the human faculties. Even when the first changes have been made, the parts remain too small to admit a very accurate examination. But
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neither the difficulty of the investigation, nor the acknowledged uncertainty of all reasoning, without the support of facts, have deterred ingenious and speculative men, in all ages, from hazarding their opinions on this subject. It is true, that little satisfaction or advantage is to be gained; but if we do not profit by the knowledge of their opinions, we may be convinced that little has hitherto been said on this subject for our information.

The first opinion recorded is, I believe, that of *Pythagoras*. He supposed that from the brain and nerves of the male, a moist vapour descended in the act of coition, by which similar parts of the *embryo* were formed. These were thought to be the seat of the soul, and of course the parts from which all the senses were derived. All the grosser parts, he imagined, were composed of the blood and humours contained in the *uterus*. He said that the *embryo* was formed in forty days, but that seven, nine, or ten months were required for the perfection of the *fœtus*, according to the laws of *harmony*. He also supposed that the same laws which guided the formation of the *fœtus*, influenced the conduct of the man.

It was a custom with the *Scythians* to cut the veins behind the ears, when they intended to

procure impotence or sterility; and it is remarkable that an opinion like that of *Pythagoras*, is entertained by the inhabitants of some of the islands lately discovered in the South Seas; and, changing the term *harmony* for magic, occult quality, and the like expressions, by which an imperfect idea is conveyed, or a concession that we have proceeded to the extent of our knowledge is made, many succeeding writers have given us their conjectures.

Empedocles presumed, that some parts of an *embryo* were contained in the *semen* of the male, and others in that of the female, and that by their mixture an *embryo* was formed. He likewise thought that the desire of procreation originated in the natural tendency of the separated parts to be united.

That conception took place in the cavity of the *uterus*, by the mixture of due proportions of the male and female *semen*, in which were equally contained the organic principles of the *embryo*, was the opinion of *Hippocrates*.

Aristotle denied the existence of *semen* in the female. He imagined that the material parts of the *embryo* were formed by the menstruous blood, and that the *semen* of the male furnished it, when formed, with the principle of life, by the operation

tion of which it was brought to perfection. It is remarkable that a philosopher, with every advantage which a superior capacity, and the most extensive opportunities of acquiring knowledge could give, should attempt to explain, what is common to all animals, by a circumstance peculiar to one class.

Galen thought that the *embryo* was formed by the substance of the male *semen*, and that the humour supplied by the female served the mere purpose of nourishing it.

Harvey employed a considerable part of his life in observing the structure of the *ovum*, and the progress of conception in a variety of animals. When he had completed his discovery of the circulation of the blood, this seems to have been his favourite study, which he prosecuted with the true spirit of inquiry, and in which he made many observations worthy of that sagacity and industry which were never exceeded. With his disposition, abilities, and advantages, it was reasonable to expect that he would have said something satisfactory upon this subject. But, after much previous apology, for an opinion which admitted no other proof, than an allusion to a circumstance of all others the most incomprehensible, he tells us, that as iron, by friction with a

magnet, becomes possessed of magnetic properties, so the *uterus*, by the act of coition, acquires a plastic power of conceiving an *embryo*, in a manner similar to that by which the brain is capable of apprehending and thinking*.

The opinion of *Hamme*, of the credit of which he appears to have been unfairly deprived by *Leeuwenhoeck*, was afterwards received with great applause, became the doctrine of the schools, and gave universal satisfaction, because it was supported by a fact, which, by the help of his microscopes, he was able to demonstrate. He asserted that, in the *semen* of all male animals, there was an infinite number of *animalculæ*, in each of which were contained the perfect rudiments of a future animal; and that these required no other assistance from the female, but a proper bed for their habitation, and nutriment for their expansion.

From him *Needham* and many others dissented; and, after several other objections of less importance, they adduced the observation of a mixed generation, as in the case of an hybrid or mule; which, being procreated by two animals

* Videtur sane fœmina, post tactum in coitu spermaticum eodem modo affici, nulloque sensibili corporeo agente prolifica fieri, quo ferrum a magnete tactum, hujus statim vi dotatur aliaque ferramenta adse allicit. — *Harv. Exercit. de Concept.*

of different species, partakes in an equal degree of the nature and likeness of the male and female parent. This seems to be a decisive and unanswerable refutation of the doctrine of *animalculæ*; and I believe the sentiments entertained at the present time are, that the moving bodies which he saw in the *semen*, were not *animalculæ*, or organized parts, but parts fitted for organization.

From the manner in which the *vagina* and *uterus* are connected, it has been thought that the male *semen* was not designed to be introduced into the *uterus* of the female; but being absorbed from the *vagina*, that it passed in the common course of the circulating blood, and was conducted to one of the *ovaria*, where it performed its proper office by the impregnation of one or more *ova*. But the examination of the *uteri* of animals in the act of coition, and of many women who have died immediately, or soon after it, fully proves that the *semen* of the male is first received into the cavity of the *uterus* *.

It has been generally supposed, that conception was produced by the substance of the male *semen*. But some have contended, that the *ovum*, when

* Vidimus cavum uteri, albo, naturali atque bono semine masculino repletum, utramque etiam tubam Fallopiam eodem semine plenam.—*Ruysh. Adv. Anatom. Dec. I.*

inclosed in the *ovarium*, was impregnated by an *aura*, exhaled from the *semen*, which contained the principle and powers of life, of which *aura* the *semen* was merely the vehicle.

Many objections being made to these and every other opinion which has been advanced upon this subject, the chemists undertook to solve all doubts, and to explain all difficulties, by the application of their principles. They presumed that the male *semen* was of an acid, and the female of an alkaline quality, from the mixture of which an effervescence arose. From some particles which subsided on the conclusion of the effervescence, they fancied that the *embryo* was formed, the fluid parts becoming the waters of the *ovum*. Others imagined that the male *semen* had the properties of milk, and the female those of rennet, by which it was coagulated, the *fœtus* being formed from the curd, and the waters of the *ovum* by those parts which resembled whey *. Various other notions have been proposed with a view of explaining this very abstruse operation; but they leave us in a state of uncertainty. Some of them may amuse, because they are ludicrous,

* Sicut lac mulsisti me, et sicut caseum coagulasti me.—*Job*.

Revera in illo tempore, cum embryones adeo exigui sunt, comperio rudimenta nostra, maximam haberi analogiam cum coagulo lactis.—*Ruyfch. Thes. vi.*

and in the description of the parts concerned, the uses they are intended to answer, and the manner in which they perform their respective offices, the imagination hath been indulged with a freedom not very consistent with the dignity of philosophy.

If we were able to discover the essential properties of the male *semen*, the precise share which the male and female contribute towards the formation of the *embryo*, and the part where the effect is produced, the advantages which would thence accrue in practice, do not appear; though it is difficult or impossible to say, to what the discovery of any truth may lead before it is discovered. But it is happy for us that those things which are beyond the comprehension, or which elude the observation of men of plain understandings, are of the least importance in practice; Providence having ordained, that the honest and industrious application of common capacities, should be equal to the exigencies of life, and the duties we owe to society.

SECTION II.

A general view of the manner in which the succession of all natural substances is preserved, might be a very useful introduction to an inquiry into the generation of animals. For, though there appears to be little resemblance between this and the principle by which inanimate bodies are continued, it is not very unreasonable to suppose, that there may be some common essential quality diffused through all nature, limited in its operation by the kind of matter on which it is destined to operate*.

Minerals constitute the lowest order of all natural bodies, and these have been thought to be increased by the assimilation or apposition of such homogeneous particles as were contained in the *matrix* or bed in which they lay. But many other causes have been assigned for the conversion of bodies into peculiar modifications; as the heat of the sun, of the central fire, cold, and al-

* Naturalia dividuntur in regna Naturæ tria, Lapideum, Vegetabile, Animale.

Lapides crescunt, Vegetabilia crescunt et vivunt, Animalia crescunt, vivunt et sentiunt.—*Linnaeus*.

ternate

ternate heat and cold, by which the ultimate determination of every mineral substance into a certain form was supposed to be effected. Some have entertained more dignified opinions of the increase of minerals, believing that there was in these a principle far superior; and that a grain of sand became a stone, by the operation of a cause, equal to that by which a vegetable, from a seed, acquired the perfection of a plant*. Others are persuaded that, in mineral substances of every kind, there are two properties, the one specific, the other general. To the first, to which the power of increase was attributed, the name of elective attraction is given; and to the latter, by which its form was preserved, that of attraction of cohesion†. These, which are most powerful in the largest masses of matter, imply some property superadded to matter, which, though slow and obscure in its operation, is equivalent for the purposes of its increase and preservation, in all its various forms, with that of life, by which vegetables and animals are propagated and preserved. In this view the term *spontaneous generation*, though not allowed in vegetables or

* *Tournefort.*

† That force by which the parts of bodies cohere is stronger than its gravity. That force, whatever be its cause, we shall call the attraction of cohesion.—*Desaguliers.*

animals,

animals, may properly be applied to minerals. It is also worthy of observation, that by the time required for the formation of matter, under every individual modification, its continuance under such modification is regulated. For, if there had been no relation between the power of increase and the tendency to decay, the whole world, in a course of years, must have been composed of matter under one peculiar form.

Through all nature, there is not found a single body which consists of materials lying in confusion; however small and apparently insignificant, every particle exhibits proofs of the majesty and wisdom of God; and it may be presumed that the elementary parts of every substance are originally composed and wrought up in the most regular order, into what is called form. Yet in mineral substances it is a form so immersed in matter, that it is ever restrained from the acquisition of the excellence of a living body, unless there be a previous destruction of its present form*. But the more refined the matter, the

* That state in which all bodies are, during the time they are losing their present form, or undergoing any change, was, by the ancients, called fermentation. In this sense the term was applied to fevers; but many modern physicians have used the same term in a more confined sense, and the application of it will not then bear examination.

more perfect is the form; and the more perfect the form, the more exquisite are the properties. Hence the common observation seems to have been made, of the encroachment, as it may be called, of one order of natural bodies upon another; of the near accession of the first minerals to the lowest vegetables, and of the first vegetables to the lowest animals, in such a manner that they can scarcely be distinguished.

Of the mineral, vegetable, and animal kingdoms, there is to common sense a clear and precise distinction, though language may be insufficient to give a definition of vegetables, which will not apply to animals. It is not satisfactory to say that vegetables have no power of loco-motion, that they have less variety of parts, that their constituent parts are more simple, that they have no appetites, and do not digest food; that they have no sensation, and are only injured by such things as destroy their organization. For it may be replied, that vegetables breathe, that they are affected by light, that they require, distinguish, and digest food, that some of them move, and others have a certain degree and kind of sensation.

Whatever may be the essential difference between vegetables and animals, it is probable, that they are both subject to the same influences; as
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in those seasons which are most favourable to vegetation, animals are generated in the greatest number; and there is evidently much resemblance in the manner of their propagation. The sexual distinction of plants is now fully proved; or it is allowed that there is a distinction between two plants of the same kind, like to that between a male and female animal; and that those vegetables in which such distinction is not observed, have both the male and female parts, and are therefore with propriety called hermaphrodites. For, though a female plant may produce seeds, to our view, in a perfect state, these, without the intervention of the fecundating principle from the male plant, remain sterile, as hath been fully shewn in the tribe of melons, the palm-tree, hemp, and many other vegetables. But a more satisfactory proof is afforded by hybrids or mule-plants, which are produced when a female vegetable of one species, hath had its seeds impregnated by the *farina* of one of another species growing near it.

In the form and structure of the seeds of vegetables of every denomination there is some peculiarity; but they all contain the rudiments of a future plant, with something added to their form, of equal efficacy for the perfection of the plant,

and therefore as justly called life, as that principle by which animals are brought to their perfection; for we know nothing of life but by its effects, the *thing* not admitting of any definition. Any seed, berry, or kernel, would be an adequate example of this subject; but we shall select nuts, because they are equally curious with the rest, and more familiar.

A nut is contained in a foliaceous cup or husk, by which it is connected to the tree. The broad end of the nut is closely attached to the cup by small vessels, which, in the early state of the nut, are very numerous; but, as it advanceth towards maturity, these gradually wither away, till the few remaining ones becoming too feeble to support the nut, it drops to the ground. This may in one sense be called the birth of the nut, though it may with more propriety be likened to the separation of the impregnated *ovum* from the *ovarium* in viviparous animals, or to the expulsion of the egg in oviparous ones. When the nut is fallen to the ground, if the bed which receives it and other circumstances are favourable to germination, a new process begins, the shell softening by the moisture absorbed by that end of the nut which before adhered to the cup, and which is more porous than the other parts. The whole internal surface of the shell is lined with a flocculent

culent substance for the prevention of injury to the kernel from the hardness of the shell, and for the reserve and preparation of the moisture already absorbed. The kernel has also two membranes, the inner of which is fine and pellucid, but the outer is of a coarser texture, resembling that substance which lines the shell. On the internal surface of the broad end of the shell there is a congeries of vessels, or a ligament, which passes, between the kernel and shell, to the *apex* of the kernel to which it is attached, and probably serves the purpose of an umbilical cord. When the shell has continued in this situation for a certain time, it decays or bursts, and gives room for the expansion of the kernel. During this interval, the process of germination is going on in the kernel, which is not deprived of its coverings, so long as they are necessary for its protection. The *corculum*, or bud, begins to sprout; the outer membranes decay; and, together with a great part of the kernel, serve as the first supply of nourishment. Then the radicle and other parts of the little plant are unfolded; and when they have acquired a certain degree of strength, the kernel is divested of all its subservient parts, the root strikes into the ground, and the plant is perfected by the vigour of its own principle.

Between

Between the production of vegetables from slips and the multiplication of *polypi*, from the section of their parts, there is at least an equal similitude with the mode of propagation of which we have already spoken. It is also deserving of notice, that, as the operation of the principle of life is often suspended for a very long time in the seeds of vegetables, without destruction in very unfavourable circumstances, the same hath been observed in inferior animals, particularly in snails*; though, in this respect, vegetables appear to have the advantage; and, from the proofs which have been given by philosophical men, of this suspension of the operation of the principle of life, divines have, by no forced construction, illustrated the doctrine of the resurrection of the human body after its decay†.

* *Annual Register*, Vol. xviii.

† See *Philosophical Transactions* for the year 1784, in which there is a very curious paper on this subject by Mr. John Hunter.

SECTION III.

OF the propagation of all the inferior orders of animals, diversified as they are, it is impossible to take notice. The greater part of these are oviparous, and it has even been asserted, that every living body was produced from an egg; but this is a very unjustifiable use of the term*.

It is probable that the eggs, properly so called, of all animals, minute as many of them are, are composed of similar parts with those of the larger oviparous animals. We may therefore be permitted to take our example from the eggs of birds, in which all the circumstances relating to the formation of the animal, have been well described by many able men, but with peculiar accuracy by the illustrious *Harvey*.

The eggs of birds are composed of two principal parts, which, from their colour, are called the yelk and the white. The yelks only are found in

* Diximus antehac ovum esse tanquam fructum animalium. *Harv. Exercitat. de Partu.*

* In omni genere animantium quæ ex coitione nascuntur, invenies ovum aliquorum esse principium, instar elementi. Ovum vero digestio est feminis.—*Macrob. Saturnal, Lib. vii. cap. xiv.*

the *ovarium*, to which they are attached, and where, it is presumed, they are impregnated. They are of different degrees of magnitude, and that which is the most perfect drops into the *infundibulum*, by which it is carried into the *uterus*, collecting in its passage the white. In the *uterus* it is clothed with its membranes and shell, after which it is expelled in a firm state*.

The texture of the shell is admirably calculated for preserving the contained parts, and for conducting that heat which is conveyed to them by incubation. Under the shell is the common membrane, which lines the whole cavity of the egg, except at the broad end; where there is a small space filled with air. Within this membrane the white, which is said to be of two kinds, is immediately contained; and near the centre, in an exquisitely fine membrane, the yelk. The white is of the same form with the shell, but the yelk is spherical. At each extremity of the yelk, next to the ends of the egg, is the *chalaza*, a white

* I cannot forbear quoting the following beautiful passage from *Harvey*.—"Columba, præsertim ea, quæ ad nos ex Africa advehitur, gaudium a coitu mirum in modum exprimit: saltat, caudam distendit, eaque imam verrit humum, rostro se pectit et ornat; quasi fecunditatis, donum summam in gloriam duceret."—*Exercitat. xxxiv.*

firm body, consisting of three globules like small hail-stones. In the *chalaza*, the several membranes are connected, by which means the various parts, in every position of the egg, are retained in their proper place. Upon the yelk, near the middle, there is a small, flat, circular body or vesicle, called the *cicatricula*, in which the rudiments of the chick are contained. In consequence of incubation, or of continued heat of any kind to a certain degree, the respective changes are produced with great exactness; but, previous to any organization of parts, the first observable alteration of importance is the formation of blood, which *Harvey* has therefore described as the *primum vivens, ultimum moriens*. The heart, which is soon perceptible, is in a short time discovered to be in motion, then the vascular system and the other constituent parts of the animal in regular order. The white of the egg becoming thinner, supplies the growing chick with nourishment, as does likewise the yelk, till it is of too large a size to be contained in the shell, which bursting, the chick is set at liberty, and carries in the *ductus intestinalis* a part of the yelk for its future sustenance, till its powers are sufficiently vigorous to enable it to take and digest extraneous food.

SECTION IV.

THE regular disposition and connexion of the various parts of matter of which the world is composed, and of the various living bodies by which it is inhabited, are not more surprising than the circumstances by which they are distinguished. For, though there is an evident series of relations by which their connexion is preserved, to each different being, there is some outward mark or inward structure, by which it is separated from those which precede and follow it. Thus in every order of animals there is observed a difference in the structure of the parts concerned in parturition, and in the *ovum* or conception which they severally produce, by which each class might be arranged as justly, as by the structure of any other internal or external part. The human *uterus* alone is pyriform, and the *placenta*, which is flat and circular, adheres to it by a broad surface. But all animals have the *uterus* divided at the *fundus* into two branches, or horns; and the gradation from the human *uterus*, to that of an animal, debased to the lowest extremity of the

viviparous class, makes a very curious part of natural history. In the *pecora* the horns are convoluted and terminated in a point, and the connecting substance between the *fœtus* and parent is divided into several portions called *cotyledons*, which adhere to as many temporary productions of the *uterus*, resembling glands. In the *feræ*, there is a variation in the horns of the *uterus*, and the connecting substance between this and the *fœtus*, though in one mass, surrounds the *uterus* like an internal belt. In the *belluæ*, the horns of the *uterus* are reflected and obtuse, and the *fœtus* has neither *placenta* or *cotyledons*, but receives its nourishment by the very capacious vessels of the membranes. These and many other varieties in every class, to which it is not possible in this inquiry to pay attention, answer some very important purpose, in giving to each animal its distinguishing properties, and in the offices performed, there is some peculiarity in manner, dependent upon structure; so that, from the circumstances attending the parturition of animals of one kind, no inferences could be made which would not be liable to many exceptions, if we compared them with those of any other.

SECTION V.

OF all viviparous animals man is the chief. The manner in which his race is propagated is the object to which we are at present to confine our attention. But that succession of opportunities necessary for such an examination not being attainable in the human species, recourse hath been had to inferior animals, on the presumption that there is not only a common principle by which viviparous animals are propagated, but also that common effects are produced by the operation of that principle. Great attention hath been paid to the cultivation of this subject, but in the detail of the circumstances which are said to occur in the conception or production of the human *fœtus*, several are admitted which it would be extremely difficult to demonstrate or prove.

Previous to or during the act of coition it is presumed, that one or more of the vesicles, or *ova*, contained in the *ovaria*, is brought to a state fit for impregnation, and that the male *semen* being transmitted into the cavity of the *uterus*, is conducted by one of the *fallopian* tubes to one of the
ovaria,

ovaria, where it perfects the rudiments of the *fœtus*, or impresses them already perfected with the principle of life. The prolific *ovum*, having undergone its first changes in the *ovarium*, is then loosened from its connexion, grasped by the *fimbriæ*, and conveyed by one of the *fallopian* tubes to the cavity of the *uterus*.

When the *ovum* is impregnated, and while it remains in the *ovarium*, the *uterus* passes through some peculiar changes, by which it is rendered fit for the reception of the *ovum**. The blood vessels of the *uterus* then appear to be enlarged, as in a slight degree of inflammation; the internal surface becomes softer and more spongy in its texture; and a white *mucus*, which has been likened in its arrangement to the web of a spider, is secreted; and, gradually assuming a more solid form and becoming vascular, adheres or is closely united to the *uterus*, to the whole cavity of which it forms a lining, except at the orifices which lead to the *fallopian* tubes and the *os uteri*.

To this membrane various names have been given, and various opinions entertained of its formation†. A justly celebrated anatomist of the

* See *Harv. Exercitat.* lxi.

† *Villosam, flocculentam, pseudo-chorion, spongy chorion,*

present time, in whose accuracy and judgment I should willingly confide, has considered it as the inner *lamina* of the *uterus*, cast off, like the *exuviae* of some animals, after every conception, and has from this circumstance called it the *decidua*; and from the manner of its passing over the *ovum*, the *decidua reflexa**. It is, however, unnecessary to debate upon the manner in which this membrane is formed, all writers upon this subject agreeing, that its formation is cotemporary with conception; or that it precedes the time when the impregnated *ovum* passes from the *ovarium* into the *uterus*. It may, therefore, be deemed an indispensably requisite preparation of the *uterus*, for the reception of the *ovum*, and the substance by which this is afterwards connected to the *uterus*; so that, if it was to receive a name from its use, it would not be improper to call it the connecting membrane of the *ovum*.

* Anatomia Uteri Human Gravidi Tabulis Illustrati.—Gul. Hunter.

SECTION VI.

THE contents of the human gravid *uterus* are comprized under the general term *ovum*, or conception, of which the component parts are, the *fœtus*, the *funis umbilicalis*, the *placenta*, the membranes, and the waters. Of these it is reasonable to think, that the *fœtus* is the only part immediately formed in consequence of the act of coition, and that the rest are previous or subsequent productions of the *ovarium* or *uterus*.

It has been thought that some of the parts of the *fœtus* were formed before the rest, and much labour hath been bestowed in ascertaining the order of their formation*. But, as the skin of the smallest *embryo* which can be examined is perfect, it may be presumed that what has been called addition or coaptation of parts, is, in fact, nothing more than the expansion or unfolding of parts already formed. Of this we have a curious example in the descent of the testicles into the

* Embryones dicendi sunt, quando membra non sunt absoluta.—*Ruyseh*.

scrotum,

scrotum, which happens only a few weeks before the birth of the child, though their prior existence in the *abdomen* is not to be doubted. This opinion is likewise illustrated by the seeds of plants, which must contain all the primordial parts of the plants, when they are first deposited in the ground, from which *they* can draw only the means of nourishment and increase.

Much industry hath likewise been used to determine the weight, length, and dimensions of the *fœtus*, at different periods of uterogestation. The utility of this inquiry, if the truth could be discovered, does not appear. But as children born of different parents, or those born of the same parents, at the same or different births, vary at all periods of pregnancy, it is reasonable to believe, that there is an original difference in their size and in other respects. Many of the varieties may also depend upon the state of the health either of the parent or child; so that it seems impossible to bring this matter to a fair conclusion.

During the continuance of the *fœtus* in the *uterus*, its internal structure is in many respects different from that of a child which has breathed; and the external figure of a child is very unlike that of an adult, in the proportions which the
various

various parts bear to each other. Of those peculiarities which give a disposition to particular diseases, we shall speak in another place.

From the time when the *fœtus* is completely formed, the head is large, if compared with the body and extremities; and the younger the *fœtus* is, the greater is the disproportion. The superior weight of the head is supposed to be the cause of its general presentation at the time of birth: but there must be some other reason; for the same presentation is equally common in quadrupeds, in whom the extraordinary weight of the head, if it existed, could not produce this effect.

+ The principal circumstances in which the *fœtus* and adult vary, are in the vascular system. In the heart of the former a communication is preserved between the right and left auricle, by an opening called the *foramen ovale*, which closes soon after birth; but a valve prevents the return of the blood from the left to the right auricle*. There is also a communicating artery, between the *aorta* and the pulmonary artery, which is

* See *Medical Transactions*, Vol. III. in which the imperfections in the construction of the heart, with their consequences, are very accurately described.

called

called the *canalis arteriosus*, and may be esteemed a branch of the pulmonary artery. This branch, which diverts immediately to the *aorta*, a large portion of that blood which circulates in the lungs, when the child has breathed, closes likewise soon after birth. In amphibious animals, the *foramen ovale* and *canalis arteriosus* are said to remain open during life.

The liver in the *fœtus* is very large, nearly filling up both the *hypochondria*, and it has vessels peculiar to that state: first, the *vena umbilicalis*, which arises from the *placenta*; and, running through the *funis*, enters the *abdomen* of the child, and passes to the liver, which it penetrates on the inferior edge, terminating in the *sinus* of the *venaportarum*. This closes soon after birth, and, with the assistance of the *peritonæum*, becomes a ligament called the falciform. Secondly, the *canalis venosus*, which, proceeding from the *sinus* of the *vena portarum*, passes across the liver to the *vena cava*. The *canalis venosus* is smaller than the *vena umbilicalis*, and only carries a portion of the blood brought by the latter to the liver.

The internal iliac arteries are very large in the *fœtus* in proportion to the external. From those, two branches arise, which, running on each side of the bladder and the sides of the *abdomen*, pass
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out of the navel of the *fœtus*, and form the two arteries of the *funis*, which, closing soon after birth, become impervious, as far as to the bladder.

These peculiarities in the vascular system of the *fœtus* are provided, to allow of that mode of circulation of the blood, which is calculated for the life which it possesseth, during its residence in the *uterus*. When the blood is brought by the *vena cava* into the right auricle of the heart, part of it passes by the *foramen ovale* into the left, and of course a smaller portion into the right ventricle. When the blood, thus diminished, is propelled by the action of the heart from the right ventricle into the pulmonary artery, a farther portion of it is conducted by the *canalis arteriosus* directly to the *aorta*. It has been conjectured, that about the fourth part of the blood which circulates through the lungs of a child which breathes, passed through them while it remained *in utero*.

The two branches of the internal iliacs which constitute the arteries of the *funis*, conduct a great portion of that blood which flows through the *aorta*, by the *funis* to the *placenta*; but, when the child is born, that blood which circulated through them, passes by the external iliacs to the

the inferior extremities, which therefore increase more speedily after birth than any other part.

The blood brought by the vein of the *funis* from the *placenta* is carried to the *sinus* of the *vena portarum*, from which, after passing through the liver, it proceeds to the *vena cava*; except that part which is conveyed by the *ductus venosus* directly to the *cava*.

The *thorax* is flatter and narrower in the *fœtus* than in a child which has breathed, because it has not been expanded by the inflation of the lungs, which are then of a more compact and firm texture. This state of the lungs, which renders them heavier than water, is esteemed a proof that the child has not breathed; but when the lungs are found to be lighter than water, which is discovered by their floating on the surface when put into that fluid, it is supposed to be an equally strong proof that the child had breathed. These circumstances of the lungs were formerly produced in evidence in courts of judicature, and inferences of the utmost importance to the acquittal or condemnation of a presumed innocent or guilty person have been made from them. But it is well known that the lungs of a child which has lived many months may be rendered heavier than water by disease;

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and

and the lungs of a child which has never breathed will become lighter than water by putrefaction; or if they have been inflated artificially, with the view of recovering a child born apparently dead. It is also to be observed, that some children just born will breathe two or three times, and then die, though every care be taken, and all proper means used for their recovery; yet the lungs will become lighter than water by this respiration, though of such short continuance. The appearance and state of the lungs may be altered by so many circumstances, that a judicious or an honest man would hesitate to put confidence in any opinion, which they have been supposed to prove; and accordingly juries are now, and have long been, directed to pay little regard to this kind of evidence. But when the murder of a helpless infant by its mother can be clearly and positively proved, it deserves to be seriously considered on what principle extraordinary lenity ought to be shewn to one, who, in the first instance, breaking through the strongest ties of human nature, afterward commits an irretrievable injury to society.

SECTION VII.

THE *funis umbilicalis* is that cord which, passing from the *abdomen* of the child to the *placenta*, maintains the communication between the *fœtus* and *placenta*. In quadrupeds the *funis* consists of two arteries and two veins, but in the human species it is composed of two arteries and one vein, the inequalities between which are filled up with a gelatinous *mucus* contained in cells, which prevents any obstruction to the circulation of the blood from accidental compression, or even when a knot is casually made in it by the irregular changes of the position of the child. The *funis* is covered by the *amnion* or inner membrane of the *ovum*, and the vein is of a sufficient size to reconduct to the *fœtus* the whole or an equal quantity of blood, to that which is conveyed by the two arteries from it to the *placenta*. The arteries very often twist round the vein in a very curious and beautiful manner; sometimes they run in a parallel line with the vein; and in some instances the arteries are contorted in such a manner as to make, upon the *funis*, one or

more large tumours or bunches resembling excrescences.

When the *embryo* can first be perceived, it is found adhering to what afterwards becomes the *placenta*, by a close connexion of the *abdomen*. In a short time the uniting part is elongated into a flat and then a conical form, and soon becomes a regular umbilical cord, the length and thickness of which are generally in proportion to the size of the *fœtus*; though every part of the *ovum* is larger according to the size of the *fœtus* in early than advanced pregnancy. The *funis* seems to be a production of the *placenta*; for, immediately after the birth of the child, there is a line which distinguishes the foetal part, where the spontaneous separation is afterwards made.

In the thickness of the *funis*, which chiefly depends upon the quantity of *mucus* contained in the cells, and in its length, there is much variety in different subjects, being in some not more than one foot, and in others exceeding three, four, or even six feet; but it is most frequently about two feet in length. It is thickest near the *abdomen* of the child, and gradually becomes more slender as it approaches to the *placenta*, into which it is usually inserted about one third from the edge. But there is much difference in this respect also, and in some

instances the blood vessels ramify before they reach the *placenta*; and when this happens it may occasion a difficulty in the extraction, or a separation of the *funis*, even when little force is exerted.

SECTION VIII.

THE *placenta* is a circular, flat, vascular, and apparently fleshy substance, different in its diameter in different subjects*, but usually extending about six inches, or over one fourth part of the shell or outside of the *ovum*. It is more than one inch in thickness in the middle, and becomes gradually thinner towards the circumference, from which the membranes are continued. The *placenta* is the principal medium by which the communication between the parent and child is preserved; but, though all have allowed the importance of the office which it performs, there has been a variety of opinions on the nature of that office, and of the manner in which it is executed.

* In quibusdam placenta reperitur crassior, amplior, et sanguine abundantior.—*Harv.*

That surface of the *placenta* which is attached to the *uterus* by the intervention of the connecting membrane, is lobulated and convex; but the other, which is covered with the *amnion* and *chorion*, is concave and smooth, except the little eminences made by the blood vessels. It is seldom found attached to the same part of the *uterus* in two successive births; and, though it most frequently adheres to the anterior part, it is occasionally fixed to any other, even to the *os uteri*; in which state it becomes a cause of a dangerous hemorrhage at the time of parturition.

The *placenta* is composed of arteries and veins, with a mixture of pulpy or cellular substance*. Of these there are two orders very curiously interwoven with each other. The first is a continuation of those from the *funis* which ramify on the internal surface of the *placenta*, the arteries running over the veins, which is a circumstance peculiar to the *placenta*; and then, sinking into its substance, anastomose and divide into innumerable small branches. The second order proceeds from the *uterus*; and these ramify in a similar manner with those from the *funis*, as appears when a *placenta* is injected from the vessels of the *funis*, and from those of the parent. The veins

* Placentæ substantia non constat glandulis, sed mire vasculosa est.—*Ruyfch*,

in their ramifications accompany the arteries as in other parts.

There have been many different opinions with respect to the manner in which the blood circulates between the parent and child, during its continuance in the *uterus*. For a long time it was believed that the intercourse between them was uninterrupted; and that the blood propelled by the powers of the parent pervaded, by a continuance of the same force, the vascular system of the *fœtus*. But repeated attempts having been made without success, to inject the whole *placenta*, *funis* and *fœtus*, from the vessels of the parent, or any part of the *uterus* from the vessels of the *funis*, it is now generally allowed that the two systems of vessels in the *placenta*, one of which may be called maternal, the other *fœtal*, are distinct. It is also admitted that the blood of the *fœtus* is, with regard to its formation, increase and circulation, unconnected with, and totally independent of, the parent; except that the matter by which the blood of the *fœtus* is formed must be derived from the parent*.

* Abunde me demonstraturum arbitror, viviparorum quoque fœtum, dum adhuc in utero continetur, non matris sanguine nutriri, spirituque ejus vegetari, sed animo viribusque suis frui, ut pullus in ovo solet, proprioque sanguine gaudere.—*Harv. Exercitat. xxxiv.*

It is thought that the blood, which has probably undergone some preparatory changes in its passage through the *uterus*, is conducted by the uterine or maternal arteries of the *placenta* in some cells or small cavities of which it is deposited; and that some part of it, or something secreted from it, is absorbed by the foetal veins of the *placenta*, and by them conveyed to the *fœtus* for its nutriment *. When the blood which circulates in the *fœtus* requires any alteration in its qualities, or when it has gone through the course of the circulation, it is carried by the arteries of the *funis* to the *placenta*, in the cells of which it is deposited, and then altered or absorbed by the maternal veins of the *placenta*, and conducted to the *uterus*, whence it may enter the common circulation of the parent. Thus it appears, according to the opinion of *Harvey* †, that the *placenta* performs the office of a gland, conveying air, and secreting the nutritious juices

* There is a very ingenious paper in the 2d part of the Medical Journal for the year 1787, written by Mr. *John Clarke*, to prove that the *fœtus* is supplied with air by means of the *placenta*.

* See a more particular account of the structure of the *placenta*, in Mr. *Hunter's* Observations on the Animal Œconomy.

† *Placenta succum alibilem a matre convenientem nutriendo fœtui concoquit.*—*Harv. Exercitat. de Uteri Membranis.*

from

from the blood, brought from the parent by the arteries of the *uterus*, and carried to the *fœtus* by the veins of the *funis* in a manner similar to that in which milk is secreted from the breasts.

The veins in the *placenta* are mentioned as the absorbents, because no lymphatic vessels have yet been discovered in the *placenta* or *funis*; nor are there any nerves in these parts; so that the only communication between the parent and child is in the vascular system.

The proofs of the manner in which the blood circulates between the parent and child are chiefly drawn from observations made upon the *funis*. When it was supposed that the child was supplied with blood in a direct stream from the parent, it was asserted that, on the division of the *funis*, if that part next to the *placenta* was not secured by a ligature, the parent would be brought into extreme danger, by the hemorrhage which must necessarily follow. But this opinion, which laid the foundation of several peculiarities in the management of the *funis* and *placenta*, is proved not to be true. For, if the *funis* be compressed immediately after the birth of the child, and whilst the circulation in it is going on, the arteries between the part compressed and the child throb violently, but those between the compression

sion and the *placenta* have no pulsation; but the vein between the part compressed and the *placenta* swells, and that part next to the *fœtus* becomes flaccid. But, if under the same circumstances the *funis* be divided, and that part next the child be not secured, the child would certainly lose its life by the hemorrhage, yet the mother would suffer no inconvenience if the other part was neglected. It is moreover proved, that a woman may die of an hemorrhage occasioned by a separation of the *placenta*, and the child be nevertheless born, after her death, in perfect health. But if the *placenta* be injured, without separation, either by the rupture of the vessels which pass upon its inner surface, or in any other way, the child, being deprived of its proper blood, would perish, yet the parent might escape without injury.

SECTION IX.

By the *placenta* and membranes which are expanded from its edge, a complete *involutum* of the *fœtus* and waters is made. They form at the same time a lining to the *uterus*; and, when expelled

pelled after the child is born, go under the common term of after-birth or *secundines*.

In the description of the membranes of the *ovum*, given by different writers, there is great dissimilarity; and it appears that much of that confusion which became the ground of controversy arose from the ambiguity of the terms used, and from the examination of the *ova* at different periods of pregnancy; so that every description might have been just, though no two representations had been the same. They have usually been mentioned as two, the *amnion** and the *chorion**; and the latter has again been divided into the true and the false. The third membrane, which from its appearance has likewise been called the villous or spongy†, and from the consideration of it as the inner *lamina* of the *uterus* cast off, as was before observed, like the *exuviae* of some animals, the *decidua* has been described by *Harvey* not as one of the membranes of the *ovum*, but as a production of the *uterus*. How far a very accurate account of the constituent parts of the *ovum*, with all the

* Quod foetum amiciat et obvolvatur.—*Harv.*

* A venarum copia sive choro nomen obtinuit.—*Idem.*

† Mihi liceat nominare membranam placentæ villosam.—*Ruyfch. Thes. Anatom. vi. 41.*

changes they undergo, may be wanted for the perfection of natural history, I cannot pretend to decide ; but in the practice of midwifery it doth not appear necessary.

It is however requisite that we should have a competent knowledge of the membranes of the *ovum* at the full period of utero-gestation, and the following explanation seems to be sufficient :— There is, first, the outer or connecting membrane, which is flocculent, spongy, and extremely vascular, completely investing the whole *ovum*, and lining the *uterus* ; secondly, the middle membrane, which is nearly pellucid, with a very few small blood vessels scattered over it, and which forms a covering to the *placenta* and *funis* ; thirdly, the inner membrane, which is transparent, of a firm texture, and lines the whole *ovum*, making also the outward covering of the *placenta* and *funis*. With the two last the *ovum* is clothed when it passes from the *ovarium* into the *uterus*, where the first is provided for its reception. These membranes, in the advanced state of pregnancy, cohere slightly to each other *, though in some *ova* there is a considerable quantity of fluid collected between them, which, be-

* Amnios et chorion sibi invicem leviter cohærent.—
Ruyseh.

ing discharged when one of the outer membranes is broken, forms one of the circumstances which has been distinguished by the name of *bye*, or false waters.

Between the middle and inner membrane, upon or near the *funis*, there is a small, flat and oblong body, which, in the early part of pregnancy, seems to be a vesicle containing lymph, which afterwards becomes of a firm and apparently fatty texture. This is called the *vesicula umbilicalis*, but its use is not known.

SECTION X.

ALL that fluid which is contained in the *ovum* is called by the general name of the waters, or the waters of the *amnion* or *ovum*. The quantity, in proportion to the size of the different parts of the *ovum*, is greatest by far in early pregnancy. At the time of parturition, in some cases, it amounts to or exceeds four pints, and in others it is scarcely equal to as many ounces. It is usually in the largest quantity when the child has been some time dead.

This

This fluid is generally transparent, often milky, and sometimes of a yellow or light brown colour, and very different in consistence; and these alterations seem to depend upon the state of the constitution. It does not coagulate with heat like the serum of the blood; and, chemically examined, it is found to be composed of phlegm, earthy matter, and sea salt, in different proportions in different subjects, on which the varieties in its appearance and consistence depend. It has been supposed to be excrementitious, but it is generally thought to be secreted from the internal surface of the *ovum*, and circulatory.

It was formerly imagined that the *fœtus* was nourished by this fluid, of which it was said to swallow some part frequently; and it was then asserted that the qualities of the fluid were adapted for its nourishment. But there have been many examples of children born without any passage to the stomach; and a few of children in which the head was wanting, and which have nevertheless arrived at the full size. These cases fully prove that there must be some other medium by which the child is nourished besides the waters. The incontrovertible uses of this fluid are to serve the purpose of affording a soft bed for the *fœtus*, to which it allows free motion,
and

and prevents any external injury during pregnancy; and, enclosed in the membranes, it procures the most gentle, yet efficacious, dilatation of the *os uteri* and soft parts at the time of parturition.

Instances have been recorded in which the waters of the *ovum* are said to have been voided so early as in the sixth month of pregnancy, without prejudice either to the child or parent. The truth of these reports seems to be doubtful, because when the membranes are intentionally broken, the action of the *uterus* never fails to come on, when all the water is evacuated. A few cases have occurred to me in practice, which might have been construed to be of this kind; for there was a daily discharge of some colourless fluid from the *vagina* for several months before delivery; but there being no diminution of the size of the *abdomen*, and the waters being regularly discharged at the time of labour, it was judged that some lymphatic vessel near the *os uteri* had been ruptured, and did not close again till the patient was delivered. I have also met with one case, in which, after the expulsion of the *placenta*, there was no sanguineous discharge, but a profusion of lymph, to the quantity of several pints, in a few hours after delivery; but the patient

tient suffered no inconvenience, except from the surprise.

The diseases of the different parts of the *ovum* will be considered when we speak of the causes of abortion.

SECTION XI.

It hath been observed that the state of the *uterus* was, in many respects, altered in consequence of impregnation. Besides the derivation of a greater quantity of blood to it and the neighbouring parts, and the formation of the connecting membrane of the *ovum*, it is endued with the properties of distention and ascent into the cavity of the *abdomen*.

The *fundus* of the *uterus* is the part first distended, and afterwards the inferior parts in regular order; at length the *cervix* is obliterated, except the mere circle of the *os uteri*; and the *uterus*, which was originally pyriform, becomes nearly oval. The distention is also more considerable on the posterior than the anterior part,
which

which is one cause of the change of position, and course of the *fallopian* tubes and ligaments. These, in the unimpregnated state, depart from the corners of the *fundus* of the *uterus* nearly at right angles; but, towards the conclusion of pregnancy, they go off from the fore part near the *cervix*, as was before observed. This distension is evidently not mechanical from the enlargement of the *ovum*, but from the accession of a new principle; for the *uterus* is never fully upon the stretch, like a bladder inflated with air, but relaxed in such a manner as to be apparently capable of bearing the increase of the *ovum* without inconvenience.

The *uterus* is placed between the bladder and *rectum*, the *os uteri* being generally projected a little backwards, so that the *axis* of the cavity of the *uterus* corresponds with that of the *pelvis*. After conception, the weight of the *uterus* being increased, it subsides lower into the *vagina*; the shortness of which is therefore reckoned one of the equivocal signs of pregnancy. But, after a certain time, the *uterus*, though more increased in weight, begins to ascend, which it continues to do till it emerges out of the *pelvis*, acquiring support from the superior and anterior part of the aperture; in which disposition and state it re-

Q

mains

mains till the changes previous to labour come on. In the latter part of pregnancy the *vagina* must therefore be elongated, and the effects of the temporary abbreviation and elongation are readily discovered in those pregnant women who have a *procidentia* of the *uterus*, or a tendency to it.

In the first pregnancy the *uterus* rises almost directly upwards, because the integuments of the *abdomen* support it forwards; and the distention may be readily perceived on each side, but commonly on one side more than the other, from the position of the child. In subsequent pregnancies the *uterus* projects forwards, the integuments generally yielding with greater or less readiness, according to the number of children which a woman hath before had; but it always lies before the *viscera* of the *abdomen*, which are raised higher and protruded backwards in proportion to its ascent and distention.

Through the integuments of the *abdomen* the *uterus* may be felt springing out of the *pelvis*, about the fourth month of pregnancy; in the fifth about the midway between the *pubis* and navel; in the sixth as high as the navel; in the seventh half-way between the navel and *scrobiculus cordis*; and in the eighth as high as the
scrobiculus

scrobiculus cordis : in the ninth month it usually begins to subside ; so that, at the time of parturition, the *fundus* of the *uterus* is not higher in the *abdomen* than in the seventh, if the *uterus* be in a proper disposition to act ; but when that is not the case the *fundus* will be as high as the *scrobiculus cordis*, even when the woman is in labour.

At the time of labour a new principle supercedes those of distention and ascent*. This gives a disposition to the *uterus* to exclude whatever is contained in its cavity, and the effect produced is in proportion to the energy of the principle and the power of the *uterus*. A perfect intelligence of this principle, and of the mode of its operation, would probably be of infinite use in practice, as we might be enabled to suppress the action thereby occasioned when premature, moderate it when too violent, strengthen it when too feeble, and regulate it in a variety of ways conducive to the welfare of our patients. On the knowledge we at present have of the manner in which this principle operates, and the circumstances by which it is influenced, the assistance

* *Expultrix uteri facultas insurgit et excitatur. Fœtus ab utero compressus, propulsatus atque expressus.—Fabr. ab Aquapendente.*

which science and dexterity can give, in cases of difficult parturition, very much depend.

But this expulsoy power, which takes place at the time of parturition, does not seem to be peculiar to the *uterus*, but to proceed from a general principle diffused through the whole body, which acts in a like manner whenever an offended part makes an extraordinary effort to free itself from any offending body; and the mode of its operation is according to the general laws of the animal economy. It is in common observation, that no violent action can be of long duration; and it might therefore be expected that the efforts made by the *uterus*, for the purpose of expelling the child at the time of birth, would be periodical; and attended with pain, from the distention and pressure which the resisting parts undergo, as we shall have occasion to observe when we speak of natural labours.

It was said that this expulsoy action was not peculiar to the *uterus*, but a property common to all parts of the body, when the longer continuance of any thing extraneous was likely to become hurtful. Their efforts on such occasions, like those of the *uterus* at the time of labour, are observed to be periodical, and accompanied with pain proportionate to the action and the sensibility of the part. Thus, in the case of a
stone

stone in the bladder, what is called a fit of the stone seems to be a consequence of an effort made by the bladder to expel the stone when injured by it; or when a small stone is passing from the kidneys to the bladder. In the coacervation of the *faeces* in the *rectum* also, when the common action of the intestines is not sufficient for their expulsion, an extraordinary action is excited periodically, which is attended with pain, returning like the action at intervals, and proportioned to it. Perhaps a more apposite illustration of a labour may be taken from stones passing from the gall bladder to the intestine. These may continue inoffensive in the bladder for a considerable time after their formation; but when an effort is made to exclude them it is always accompanied with pain, periodical in its returns, and excruciating in its degree, from the sensibility of the parts immediately affected or drawn into consent.

Of the primary causes of this general property we may justly be said to be ignorant, as we are likewise of that of the action of the *uterus* in particular, except from its effects. But the causes appear to be different. First, there is the genuine or original cause, which produces the action of the *uterus* at a proper time and in a proper manner; secondly, adventitious causes operating

upon the *uterus*, and producing that action to which it is disposed, at an improper time, and in an irregular manner; thirdly, sympathetic causes, when a disturbance originates in some parts connected with or consenting with the *uterus*, and is transferred or spread from the part first affected to the *uterus*.

We may search for the original or genuine cause of the action of the *uterus*, in its structure, form, or qualities, or some peculiar, though inexplicable impression made upon it by the child, at the full period of utero-gestation. The manner in which the effects are produced is much influenced also by the circumstances of the constitution, as its strength and disposition to act; and it appears that the blood is of much importance in this respect; for, in hemorrhages, though there be a disposition in the *uterus* to act, there is no power of action; and in other cases, when there is apparently no want of strength, the disposition to act is wanting.

The action of the *uterus* is totally independent of the will, and therefore often comes on during sleep, having produced its effect before the patient is awake. But, if the whole frame be disturbed by any violent emotion of the mind, the action of the *uterus* may be induced, obstructed,
or

or suppressed. The progress of a labour is therefore often retarded by such passions as depress the spirits; as, on the contrary, it is accelerated by cheerfulness, by resolution, and a certain preparation of the mind for enduring pain and fatigue.

Opinions were formerly much divided with respect to the state of the *uterus* during pregnancy, but it was generally imagined to become thinner in proportion to its distention. But later observations have proved that it retains its thickness through the whole period, to whatever degree it may be distended. By this thickness, which is the medium of its strength, the human *uterus* is capable of exerting infinitely greater power for the expulsion of its contents than that of any animal. Had there been a necessity for an equal degree of force, animals would have failed to perform the office of parturition, because there is not the same medium by which that force could have been exerted. As greater force is therefore required and exerted in human parturition than in that of animals, there must of necessity be a greater degree of pain, even if we allow them to have an equal degree of sensibility.

The adventitious causes of the action of the *uterus*, which are numerous, may arise from the

general state of the body, as a fever; or the particular state of the *uterus*, as a disease of the part itself; or some extraneous irritation of the *os uteri*, between which and the *uterus* there seems to be a consent similar to that between the *cardia* and the stomach. This was known to the ancients, who occasionally introduced irritating substances into the *vagina*, for the purpose of facilitating or accelerating the birth of the child. But, with regard to adventitious causes of every kind, it appears that their effect continues only so long as they are applied, and the action of the *uterus* produced by them is less perfect than when it arises from the genuine cause. Thus, if the premature action of the *uterus* be brought on by irritation of the *os uteri*, it proceeds only during the continuance of the irritation, unless it be urged till the original cause of the action of the *uterus* should supervene. Hence the observation was made, that if the *os uteri* has been untimely dilated by any improper management it will close again, and the woman often go on to her full time, if she be kept in a quiet state*.

The sympathetic causes of the action of the *uterus* may arise from the disturbance of any part

* See *Chapman's Treatise on Midwifery*, chap. v. case i.

with which the *uterus* is connected or disposed to consent, as is the case with all the contents of the *abdomen*, especially with the lower part of the intestinal canal and the bladder, as in a *tenesmus* or stranguary. On the removal of these, the action of the *uterus* caused by them will presently cease; but if the disturbance be violent, and of long continuance, the *uterus*, though the original cause be wanting, may assume that action to which, by its structure, it is disposed, at any period of pregnancy, and the exclusion of its contents will of course follow.

From adventitious and sympathetic causes the action of the *uterus* is often produced at the latter part of pregnancy, and from the want of a just distinction encouraged, to the great detriment of the patient. In such cases the action of the *uterus* may continue during the continuance of the cause, or it may become regular, proceeding after the cause is removed, or it may cease entirely on the removal of the cause. Of all these there are frequent instances in practice; and, seeing there is such variety in the causes of the action of the *uterus*, it is not surprising that there should be such difference in the effect produced, and so many deviations from the ordinary course of labours,

All

All the difficulties attending parturition may be reduced to two kinds: first, those which arise from the imperfect action of the *uterus*; secondly, those which are occasioned by the resistance made to that action when duly exerted. The regulation of, or best method of assisting that action or power, and the removal of the impediments to its effect, are the chief objects in the practice of midwifery.

CHAPTER VI.

SECTION I.

ON THE SIGNS OF CONCEPTION, AND THE
DISEASES OF PREGNANCY.

CONCEPTION is succeeded by many important changes in the constitution, and usually by affections of various parts, which, in the beginning of pregnancy, are esteemed *signs* that a woman hath conceived: but, in the more advanced state, the same or similar changes and affections have been termed and considered as the *diseases of pregnancy*. Yet, in either state, they evidently do not depend upon pregnancy as a specific cause, being often occasioned by irritation or disturbance of the *uterus* from other causes. Nor do they commence with conception, and continue to the time of parturition; but are in general most frequent, and most troublesome also, soon after conception, gradually abating, and often wholly disappearing, as the patient advances in pregnancy. The signs of conception are therefore very ambiguous and uncertain;

uncertain; though, from the common occurrence of the case, and the particular attention which is paid, a faculty of discriminating them is acquired, which generally prevents error.

It is a popular observation, confirmed by experience, 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. With this view the diseases of pregnancy may be divided into two classes; in the first of which will be included all those which occur in the early, and in the second those in the latter part of pregnancy. The time of *quickening* may constitute the line of distinction between them; and we shall thus be led to the most useful method of proceeding, that of observing the complaints in the order in which they arise.

It appears that every part of a living body has two principles, or performs two offices; one of which

which regards its own distinct preservation and ease; the other, by which each part contributes to and partakes of the harmony or disorder of the whole frame. The degree of disposition and ability to perform these offices, and the manner in which they are performed, vary in different parts, and for peculiar purposes; but it may be presumed that they both potentially exist in every part, though not at all times actually exerted. When these offices are executed in a manner and degree necessary for, and consistent with, the common purposes of *being*, they are called natural; but when they are irregular or excessive, or are excited on extraordinary occasions, though the existence of the occasion may render them needful, they are not improperly termed violent or morbid. The disposition to act is called irritability, and the action, when produced, irritation. Irritation is described to be of two kinds. It may be confined to the part in which the cause exists, or it may be transferred and extended to some distinct or distant part. The first is called simple irritation, and the latter sympathy or irritation by consent. Sympathy*, or irritation by consent, has again been distinguished into two kinds, pri-

* Distinguitur irritabilitas in primariam seu directam, et secundariam seu per consensum.—*Glisson, Tractat. de Ventric. et Intestin.*

mary or direct, and secondary or intermediate. The modes of this consent between distinct and distant parts have been variously explained, and assigned to many different causes*; but with the propriety of the explanations, or the ingenuity of theories, we are not, on the present occasion, concerned.

The truth of no observation in medicine has been more generally acknowledged than that of the extreme irritability of the *uterus*, and of the propensity which the whole body has to be affected or disturbed by its influence†. Some parts are nevertheless more disposed to this influence than others, some by direct consent, and some by the interposition of other parts. Those affections which occur most frequently during, or in con-

* *Quinque adminicula, quibus una pars alterius affectum sua naturali perceptione eousque cognoscat, ut eisdem compatiatur, proposuero. Primum est immediata continuitas, præsertim fibrarum et tunicarum partium; secundum, nervorum a communi stipite derivatio; tertium, influxus per arterias mutatus; quartum, reductio per venas præpedita aut diminuta; quintum, contactus vel alia idonea vicinitas, qua una pars in aliam agat.*

Glisson, who was physician to Queen Elizabeth, has a right to be esteemed the father of the doctrine of irritability. He uses the word *perception* for irritability, and the word irritability for sympathy, or disposition to consent.

† *Est enim uterus pars principalis, quæ totum corpus facile in consensum trahit.—Harv. Exercitat. de Partu.*

sequence of pregnancy, it is necessary that we should understand, that we may be able to form a competent judgment of the subject; and for this purpose the following account will be sufficient either in the way of illustration or example.

Between the *uterus* and the breasts the consent is so intimate and constant, that it is scarcely possible for them to be affected separately. The enlargement of, and shooting pains in, the breasts are therefore not improperly enumerated among the symptoms of pregnancy; though they are also observed to occur at the time of the final cessation of the *menfes*, when these are casually obstructed, and in some women in a slight degree at each period of menstruation.

The *areola*, or brown circle round the nipples, has been represented as an indubitable mark of pregnancy. This is not however suspected to be a primary consequence of a particular affection of the *uterus*, but of the preceding enlargement of the breasts; and, though it generally occurs in pregnancy, it may be produced by any cause capable of giving to the breasts a state resembling that which they are in at the time of pregnancy, of which it can only be esteemed a doubtful sign. Equally or more uncertain, for the same reason, is uneasiness about the navel,

and in the region of the *uterus*, though frequently attendant upon pregnancy; and which, as far as I know, is a symptom peculiar to affections of the *uterus*. The navel also constantly emerges during pregnancy.

There are few diseases of much importance in any part of the body in which the stomach is not affected; but the consent between this and the *uterus* is peculiarly frequent, and often violent. It is not therefore surprising that the stomach during pregnancy should so generally be disturbed with *nausea*, vomiting, heartburn, and indigestion; or that such complaints should have been considered as the symptoms of pregnancy.

In consequence of these affections of the stomach, and perhaps by direct consent with the *uterus*, any part of the intestinal canal may be disturbed during pregnancy; but the particular part may be casual, and the manner will depend upon some peculiarity in the constitution of different women, as the same cause may produce very different or contrary effects. Some women, who are at all other times constipated, have a *diarrhæa* at each period of menstruation; and those who are at other times subject to a *diarrhæa* then become unusually costive; and similar changes often take place when women are pregnant.

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The whole habit of the body may be disturbed by a certain state of the *uterus*, and yet no individual part be peculiarly affected. Hence, at the time of pregnancy, there frequently occurs a feverish disposition, with debility, emaciation, and many symptoms common to hectic fevers; by which the countenance becomes altered, the eyes appear larger, the mouth wider, and a sharpness is given to every feature. In consequence also of this general and perpetual irritation, the temper of pregnant women is sometimes rendered less gentle and patient than is consistent with their usual character.

The consent between the *uterus* and stomach seems to be of that kind which has been called primary or direct; but affections of the brain, heart, and lungs, appear to be secondary, or by the intervention of the stomach. Pain and giddiness of the head, dimness of the sight, sleepiness, convulsions, palsy, palpitation of the heart, and peripneumonic complaints, though they sometimes occur during pregnancy, are less frequent than such as are produced by the direct consent of any part with the *uterus*.

There are also many instances of affections of the *uterus* from its consent with other parts. A strangury, or *tenesmus*, may occasion a similar af-

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fection of the *os uteri*; and if they were to continue, a premature expulsion of the *fœtus*. Pain in the stomach or bowels, or of any part contiguous to the *uterus*, or with which it is prone to consent, may disturb it; and, if extremely violent, or of long continuance, may produce the same effect. From these it appears that, when an abortion is apprehended, there is not only occasion to attend to and moderate those circumstances which may arise from original affections of the *uterus*, but those also which may be produced in some other part, and extend to the *uterus*.

From these observations it will not be inferred that every complaint which happens to pregnant women is to be attributed to uterine irritation. For some appear to be caused mechanically by the pressure of the enlarged *uterus*, and all of them to be aggravated by the erect position of the body. The distinction which was made will nevertheless be equally proper; for, before the time of *quickening*, the complaints are generally owing to an increased irritability of the constitution, or to the admission of a new cause of irritation; and afterwards to the enlargement of the *uterus*. But, without a very strict adherence to any general distinction, we will recollect that a
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small degree of enlargement of the *uterus*, with its consequent irritability, may become the cause of disease in early pregnancy; and that such a degree of irritability may arise or continue towards the conclusion, as will create symptoms like those which might be expected at the commencement.

SECTION II.

By the term *quickening* is understood the first sensation which the mother has of the motion of the child. This happens at different periods of pregnancy, from the tenth to the twenty-fifth week, but most commonly about the sixteenth after conception; but the motion of the child is in some women so obscure, or such little attention is paid to it, that it is not perceived or regarded; and in others so indistinct as to be confounded with various other sensations. In cases therefore of supposed, but mistaken pregnancy, women often fancy that they feel the motion of the child; or, if a child dies *in utero*, when there is, after birth, the fullest proof that it has been long dead.

It is not unusual for women to have a few drops of blood discharged from the *vagina* at the time of quickening without any inconvenience; but the symptoms which attend are generally such as are occasioned by surprise from any other cause, as fainting, or some hystERIC affection. These being of short duration require no other means of relief than exposition to the open air, a glass of cold water, or some light cordial, and a short confinement to an horizontal position.

The changes which follow quickening have been attributed to various causes. By some it has been conjectured that the child then acquired a new mode of existence; or that it was arrived to such a size as to be able to dispense with the menstruous blood, before retained in the constitution of the parent, which it disturbed by its quantity or malignity. But it is not now suspected that there is any difference between the aboriginal life of the child, and that which it possesses at any period of pregnancy, though there may be an alteration in the proofs of its existence, by the enlargement of its size, and the acquisition of greater strength. It was before observed, that the notion of the influence of the retained *menfes* seemed to have been admitted without foundation. Others have believed that the changes

changes ought to be assigned merely to the enlargement of the *uterus*, increased by the growth of the *ovum* to such a size, that it was supported above the brim of the *pelvis*; by which means all the inconveniences which arose from the dragging or subsidence of the *uterus* in the *vagina* were removed: and this seems to be the true reason. Because, in morbid enlargements of the *uterus*, not of a scirrhus or cancerous nature, there is an abatement of the symptoms when it becomes of a certain size; which circumstance has often rendered patients an easy prey to empirics, who have availed themselves of the impressions made by the casual and temporary relief as the critical moment for imposition. But if the explanation is not satisfactory the changes are very important; for whatever complaints women before suffered, in general after that time they decline or are wholly removed.

SECTION III.

A suppression of the *menfes* is one of the never-failing consequences of conception, at least I have not met with a single instance of any woman continuing to menstruate when she was pregnant; though I know that popular opinion is against the assertion, and that exceptions to it are frequently mentioned by men of science. What gratification the human mind is capable of receiving by the affectation of singularities of constitution, which do not depend upon our will or power, and from which neither reputation nor advantage can be derived, philosophers may determine. But it is well known that in practice there is great occasion to be circumspect; for, either from the misrepresentation of patients, or the credulity or vanity of writers, many medical works are filled with the most useless and improbable histories, and defective in the essential article of all records, truth; and this charge hath been made in the most pointed terms against many writings on the subject of midwifery. Some who have said that women might menstruate during

during pregnancy have supposed the discharge to be made from the vessels of the *vagina* or neighbouring parts; or they have considered every eruption of blood from the *uterus* as menstruous. But if menstruation, according to the definition already given, had continued in pregnancy, it is scarcely possible but that abortion must have followed, as a part of the *ovum* would necessarily have been detached from the *uterus* at every period; unless we conclude that, by some subsequent process, their connexion had been re-established. As therefore, in cases in which pregnancy can be suspected, we have, in the suppression of the *menfes*, the best proof of its existence, and in their continuance, of the contrary; it will be wiser to place our confidence in, and to form our judgment by this circumstance, than to involve ourselves in doubt, by searching after equivocal appearances which cannot lead to any satisfactory conclusion.

SECTION IV.

ALL the complaints attending pregnancy, and perhaps the state of pregnancy, is accompanied with a febrile disposition. This seems to be proved by the blood of pregnant women, which, independently of disease, is always found to have what is called a fizy appearance, though of a peculiar kind, and evidently very different from that which is observed in cases of inflammation. But if any inflammatory disease should occur in pregnancy then the blood loses its pregnant appearance, as it may be termed, and assumes that of the disease. An extreme degree of those symptoms which appertain to pregnancy may also produce this inflammatory appearance of the blood. From this state of the blood, and from the relief which bleeding almost universally affords in the urgent complaints of pregnant women, even in constitutions which at other times do not well bear that evacuation, occasion hath been taken to attribute all the consequences of pregnancy to a *plethora*, of which the retained *menfes* were thought to be the cause. But if it be true that pregnant women have such feverish dispositions,

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we have no reason to be solicitous about the investigation of the cause, as, by bleeding at proper times, and in quantities suited to the constitution and indications, both the effects of uterine irritation and *plethora* are removed.

Particular kinds of diet are found to add to this disposition to inflammation, and to increase irritability. Of these the principal is animal food, though it is usually recommended, together with liquids of a cordial and nutritive quality, to women when pregnant, on the presumption that they are then in greater need of such support than at any other time. To some constitutions, and under particular circumstances, these may be necessary; but, if it be justifiable to draw inferences from the appetites of pregnant women, or if we may judge from the common consequences of such diet, we shall soon be convinced that it is improper; for they have generally a dislike to animal food of every kind and under every form; and if prevailed upon to eat it incautiously, are sensible of much inconvenience. On the contrary, they prefer vegetables, fruit, and every thing cooling, which they eat and drink with avidity, and in which they indulge without prejudice.

SECTION V.

PREGNANT women are not only encouraged to live more luxuriously, but more indolently also, exercise being thought improper, unless towards the conclusion of pregnancy, when it has been supposed to procure a more favourable delivery. Great care may in some cases be necessary, but in general the contrary method of proceeding is the most eligible and proper: for the lower class of women, who are by necessity obliged to follow laborious occupations in the open air, and who are exposed to all the vicissitudes of the weather, not only pass the time of their pregnancy with fewer complaints than the affluent, but have also more easy labours. Much allowance must be made to the former habits of living; but those who are in possession of all the advantages of rank and fortune, which the eyes of inferiors are apt to look at with envy, must use them with the most cautious moderation, or they will suffer for every unreasonable indulgence. By every kind of habitual irregularity the constitution becomes loaded, or the activity of its powers

powers lessened or perverted, and a disposition to disease is given; or all sense of natural enjoyment is lost. We have been accustomed to consider parturition as a distinct act of the constitution, unconnected with any which precedes or follows; but there would be more utility in considering it as a part of a process, beginning with conception, and terminating with childbed. We should then presume that such as is the state of the body at the time of conception, such will it be during pregnancy; and, according to the state in pregnancy, will be that at the time of parturition; and on this will depend the recovery from childbed, unless there be some peculiar imperfection in the constitution, or some disease not dependent upon that state should supervene. On the due and regular exercise of all the functions and powers of the body, their disposition and ability to act, according to their original frame, must ultimately depend; and such as is their general condition at the time of labour such will be that of the *uterus*, and of all the parts concerned in parturition. But if there has been indulgence in improper habits, or if exercise has been neglected at all other times, there is little cause to expect advantage from unfit and extraordinary efforts towards the conclusion of pregnancy, as no other

end can then be answered by such conduct but that of disturbing the frame, and bringing on premature labour. In quadrupeds, which apparently suffer little other inconvenience when they are with young than that which arises from mere increase of bulk, their common pursuits are neglected, the gregarious disposition is suspended, and, if left to their own inclinations, they gradually lessen the exercise they use as they advance in pregnancy.

SECTION VI.

VOMITING is one of the most frequent complaints to which women are liable in the early part of pregnancy; and it sometimes continues to or returns towards the conclusion. If it should not be violent, and occur only in the early part of the day, though very troublesome, it is so far from being detrimental that it is generally found to be serviceable, by exciting a more vigorous action of the *uterus*, and by bringing the stomach into a better state. For the vomiting of pregnant women is not a mere effort of straining, or a discharge

charge of the food and common humours of the stomach; the matter evacuated is evidently of such a kind that, if it had remained, it must have been prejudicial. When, therefore, medicines are given for the purpose of restraining the vomiting, care should be taken to procure stools, or worse consequences may be expected than those which would have arisen from the vomiting.

In plethoric habits the act of vomiting may render bleeding necessary, though the disease or state of which it is a symptom might not require that evacuation. For this reason, and because it lessens the irritability of the habit, bleeding will in many cases be necessary in pregnancy; though, under some circumstances, it is neither requisite nor proper. Nor are medicines of any kind wanted to restrain the vomiting, except it should be extreme, so that the strength of the patient is reduced, or other untoward consequences follow. Then the common means used for the relief of this symptom in other cases may be safely and properly advised for pregnant women; as the saline draughts in the state of effervescence, or mixed with some absorbent earth, in the manner of the *mistura corollata* of Fuller; or magnesia in simple peppermint-water; or the *Seltzer* water, whilst it effervesces, with a mixture

ture of lemon juice and sugar; or the acid elixir of vitriol in cold water; or small quantities of *Colombo* root; or chamomile flowers, joined with some aromatic, in substance or infusion. Moderate cordials are sometimes required; and of these the most grateful is the *confectio alkermes*, in simple mint or cinnamon water. Many other medicines of the same kind may be directed in such forms as are found to be most acceptable to the patient.

In cases of excessive vomiting opiates are generally given, and often with great advantage. Perhaps no reasonable objection can be made to the occasional use of opiates, when violent pain or any other urgent symptom demands them. But I am fully persuaded that their habitual or very frequent use is prejudicial to the *fœtus*, either by debarring it from a proper supply of nourishment, or by depraving that with which it is actually supplied. The same observation hath been frequently made on spirituous liquors, and probably the effect of both may be explained upon the same principle.

Local applications of various kinds have been recommended to abate excessive vomiting, and consent is readily given to their use, though without the expectation of great advantage, because

cause no harm is apprehended from them. But a physician of great experience and strict veracity informed me that he had in these cases seen the application of a piece of folded cloth moistened with *tinctura opii*, to the region of the stomach, do much service, when internal medicines of the highest estimation had proved ineffectual.

It is a general observation that the vomiting of pregnant women is most frequent and importunate in the morning; and the circumstance evidently depends on the change of position which then takes place, and not the peculiar time. When the position is horizontal the patient may not have the least sense of uneasiness or disturbance of the stomach; but the moment she rises from her bed these come on, and continue till she again reclines, unless she is careful to bring the body erect by rising slowly. Confinement to an horizontal position is therefore found both necessary and useful, not only when the stomach is violently disturbed in consequence of pregnancy, but from many other causes.

When there is a nausea or inclination to vomit without any evacuation, a gentle emetic is the best remedy; and this may be repeated whenever the urgency of the symptom requires it, experience having fully proved, that emetics may be given to pregnant women with perfect safety.

SECTION VII.

INDIGESTION, depravity and loss of appetite, proceed from the same cause with the foregoing complaint, of which they are only different modifications; and the treatment commonly enjoined for their relief will be suitable for pregnant women. Of that depravity of the appetite, which in pregnancy has usually gone under the name of *longing*, the instances recorded in books, and formerly reported in conversation, are incredible, and too absurd to deserve, or, at least at this time, to require a serious refutation. *Longing* was not supposed to depend upon the fancy or other circumstances of the mother, but to be a peculiarity in her appetite, produced by the influence of some cause existing in the child. Nor was it supposed that the effect was confined to the simple refusal or gratification of the appetite, however extravagant it was, or however unnatural it might appear; the *longing* of pregnant women was to be indulged, not merely through kindness to the parent, but for the interest of the *fœtus* also. If her wishes and inclinations were not gratified
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the might suffer; but the worst consequences were to be apprehended on account of the child, which would either be retarded in its progress, or bear the mark of the thing longed for on some part of its body; as if there was a connexion between the two beings incomprehensible by us, and infinitely more exalted than is observed under any other circumstances. Nor was the observation of similar accidents in animals, or even in plants, considered as a valid argument against this extravagant opinion.

In times and countries barely civilized, can we suspect that it was thought necessary to adopt and to support the opinion of the power of the imagination, in order to secure to pregnant women that tenderness of treatment which their situation requires? Or does there really exist any mysterious consent between the parent and *fœtus in utero* in the human species? I believe that the opinion originated in the former cause; but that in the course of time, and by the habit of thinking and acting in a certain manner, a general conviction did take place, that some consent of an inexplicable and perhaps of a divine nature, not to be defined or illustrated, really existed. An opinion which might have been useful and necessary at the time when it was first established,

continued when there was no longer occasion for it, and became a source of real disadvantage. For the minds of women were frequently disturbed, and themselves rendered miserable, by the dread of an effect, the cause of which was wholly imaginary; sometimes also sinister purposes were intended to be answered by the pretence. It then became necessary to examine the opinion, and it was proved to be groundless. In the early part of my own life nothing was more common than to hear an inundation of examples of the dreadful events which were caused by disappointed *longing*; or to see instances of the great confusion and distress in families, from a persuasion of its importance. But at the present time, and in this country, the term *longing* is seldom mentioned, except among the lowest class of people; though the cause, if any had existed, must have produced its effect at all times and in all situations. Something is, however, to be granted to *longing*, considered as an appetite depending upon the constitution, of a certain state of which it may be esteemed an indication. If we believed the doctrine, that diseases and tendencies to them were produced by an excess of acid or alkalescent humours, we might readily understand why one pregnant woman prefers the most savoury and high-

high-seasoned food, and another acid fruits and cold water; and why they might both be indulged, not only without prejudice, but with advantage; as has been frequently observed in the delirium of fevers from a similar cause. The appetite, unsophisticated by bad habits, will probably never mislead us as to the quality of our food. It may rather be esteemed a guide implanted in us by nature, which we shall never err in following with discretion.

SECTION VIII.

THE heart-burn is a painful sense of heat in the throat and *fauces*, with sudden gurgitations of thin saliva in the mouth. In some cases it seems to be a mere sensation arising from the consent between the stomach and *uterus*; and in others to be caused by an accumulation of sharp humours secreted in the stomach. There is often reason to think that it is occasioned by food which is salt and high-seasoned, or otherwise hard of digestion, and by fermented liquors; and

perhaps by sleeping in an erect position after a full meal. The medicines usually directed for this complaint are given with the intention of abating or removing the sensation, of altering the properties of the fluid collected in the stomach, or of evacuating them. These generally consist of the various kinds of absorbent earth, as the testaceous powders, or magnesia alone, or mixed with rhubarb; or lime-water, or small doses of saline medicines, of which perhaps the best is the *aqua kali*, to the quantity of twenty drops in a large glass of cold water. When the complaint is violent, a gentle emetic is the most effectual remedy; and, should the disposition to it originate in the debility of the powers of digestion, such means are to be used, and such medicines given, as promise to restore or to invigorate them.

SECTION IX.

COSTIVENESS is another troublesome complaint to which pregnant women are liable. It is always hurtful in its present effects, and often in its consequences, being not uncommonly the

cause of head-ach, fever, tenesmus, pain in the bowels, and abortion. Care must therefore be taken to obviate costiveness by the constant or occasional use of manna, magnesia, fenna, electuary of fenna or of cassia, *oleum ricini*, soluble tartar, Jessop's-well water, and the like medicines.

The more gentle the means used the more eligible they are, provided they answer the intention. Aloetic medicines are forbid during pregnancy, lest they should do mischief by their supposed deobstruent qualities; but they are in common use among the lower class of people, because they are cheap, and conveniently given in the form of pills; and I have not observed any bad effects from them. The stomach of pregnant women is often in such a state that no internal medicines can be retained, and we are obliged to have recourse to clysters, which are generally efficacious, and always safe. It is remarkable that small doses of the *sal catharticus amarus*, dissolved in plain or simple mint-water, or common emulsion, will often be kept upon the stomach, when things less obnoxious to the taste are immediately rejected.

SECTION X.

By long-continued costiveness the *faeces* are sometimes collected in so large a quantity, and, by long confinement in the *rectum* and lower part of the *colon*, become indurated to such a degree, that they cannot be voided by the common action of the intestines; and the medicines usually given, and the means used to procure stools, prove insufficient for the purpose. This complaint is not peculiar to women when pregnant, being found to occur indiscriminately in either sex, if compelled by disease or accidents to remain for a long time in an horizontal position; and it is not unfrequent in children, or even in animals. It has often been mentioned by medical writers, though no proper name has been given to it. Among the vulgar it is called the *ball-stool*.

There is reason to believe that this complaint has often been overlooked in practice; for, though the column of indurated *faeces* is enormous, a small quantity in a liquid state, escaping by the side of the intestine, may be discharged; so that

no fufpicion of the real nature of the cafe may be entertained, unlefs the patient be examined *per anum*.

When it has continued for a certain time, and the common efforts of the inteftines, though repeatedly excited, are not equal to the expulfion of the *fæces*, their extraordinary action is raifed, which is attended with pain, periodical in its returns, and violent in its degree. This action continues till the difficulty is overcome, or, by the effect of the long and fruitless action, the parts adjoining to the *anus*, and perhaps the internal parts, become inflamed; and, if proper and timely means are not ufed to prevent the mischief, fphacelated.

Purgative medicines rather increafe this complaint, by folliciting a greater quantity of *fæces* into the lower part of the inteftinal canal, when they cannot be difcharged. Suppositories and clyfters, at leaft in the way in which they are commonly adminiftered, cannot be received on account of the greatnefs of the obftruction, to the removal of which they are not equal. Effectual relief is only to be obtained by dividing the indurated *fæces* into fmall pieces, by manual affiftance, or by fome convenient instrument conducted into the *anus*, and ufed with circum-
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spection, and then by washing them away with repeated clysters. In women there is less difficulty in the management of these cases, because the column of *fæces* may not only be separated by the finger passed into the *vagina*, but their exclusion very much assisted,

SECTION XI.

PERHAPS women are by constitution, and by the sedentary lives they lead, more subject to the hemorrhoids than men. Those are generally esteemed as indications of too great fulness of the habit, or as critical dispositions upon the parts of something noxious to the constitution: they are also an ordinary consequence of long-continued costiveness; and, during pregnancy, they may be caused or increased by the derivation of a greater quantity of blood to the parts, or by the pressure made upon the vessels by the enlarged *uterus*. When this complaint is in a moderate degree the patient is soon relieved by gentle purgative and diuretic medicines; and those composed of
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fulphur are, in this case, usually preferred; though some physicians have suspected their propriety. Cooling applications are also advised, and of these the best is a weak solution of the *cerussa acetata*. Should the patient be feverish, or the hemorrhoids much tumefied and painful, bleeding, in quantities suited to the constitution and the exigence of the case, is necessary; or one or more leeches may be applied to those which are most prominent, if they do not discharge spontaneously. Emollient fomentations and cataplasms are sometimes proper. In general, unctuous applications do not agree; but ointment of elder-flowers, mixed with an equal quantity of brown sugar, or a small quantity of some lixivial salt, is thought, in some cases, to have done much service. In some cases, when the hemorrhoids are very numerous and much tumefied, immediate relief may be obtained by firm and gentle pressure, between the finger and thumb, of each distinct hemorrhoid.

SECTION XII.

THE skin of women with child is often discoloured in spots or blotches, especially about the neck and face. It may be disagreeable to those who are solicitous about such matters; but it is not otherwise important. Women have sometimes also a true jaundice; and, whether we attempt to remove the obstruction to the due secretion of the bile, by emetics or purgatives, or deobstruents, as they are called, there appears to be no reason why pregnant women should not bear their operation. Men of discretion will readily see the impropriety of giving a medicine, the operation of which might be more dangerous than the disease which it is intended to cure; and the necessity of accommodating its quantity to the state of the patient, as well as its quality to the disease.

SECTION XIII.

WOMEN with child are chiefly subject to those complaints of the intestines which may be supposed to arise from their inert action; but they are sometimes liable to those which are occasioned by too much irritability. But the latter are far less frequent than the former, though a tenesmus, a diarrhœa, or dysenteric complaints, may happen at any period of utero-gestation.

When these affections of the bowels are of sufficient consequence to require medical attention, the common mode of treatment is equally efficacious and consistent with the safety of a pregnant woman as under any other circumstances. When there is a feverish disposition bleeding is proper; and when there are signs of disturbance in the stomach, from offensive humours, or preceding crapulous complaints, gentle emetics may be given, and the repetitions may be unlimited, if necessary. If there be much pain in the bowels, or frequent efforts to go to stool, with little or insufficient evacuations, purgative medicines, of which perhaps the best is the *saf catharticus amarus* alone, or joined with rhubarb, ought to be given, and occasionally repeated,

peated, according to the continuance of the pain in any stage of the disease. Should the complaint remain after the evacuations, opiates are proper, mixed with some mild astringent medicines, as the *mixtura e creta* with *tinctura cinnamomi*. In some cases *ippecacuanha* in small doses not exceeding a grain, or even half a grain, mixed with some absorbent powder and given every six hours, answers the purpose of quieting the disturbance of the bowels, without procuring any evacuation. The use of opiates is in many of these cases indispensable. Clysters, composed of a decoction of linseed, or of flower and water boiled to the consistence of thin starch, or of mutton broth, are both comfortable and useful; and to any of these a few drops of the *tinctura opii* may be occasionally added.

A tenesmus, or diarrhœa, is a common attendant on abortions, of which they are justly esteemed to be sometimes the cause. In these cases it appears that the existence of the irritation in the *rectum* is unfavourable to the proper action of the *uterus*, and may directly, or by consent, become the cause of abortion. Emetics, by relieving the present inconvenience, and by changing the seat of the irritation, will often prevent any ill consequences.

SECTION XIV.

THE strangury, which is a frequent inclination to void the urine, and a painful discharge of it in small quantities, is not an unusual complaint in pregnancy; in the early periods of which it seems to be occasioned by the consent between the *uterus* and bladder; but, towards the conclusion, by the mere pressure of the enlarged *uterus*. It is sometimes caused also by the restraint which women impose upon themselves, from motives of delicacy, when they are engaged in company. Under any of these circumstances it may terminate in a suppression of urine, which, when the *uterus* is of a certain size, that is, about the third month of pregnancy, becomes the cause of its retroversion.

For the relief of the strangury, it is in some cases necessary to bleed, and in all to procure stools by clysters, or very gentle aperient medicines. A small quantity of oil of almonds, with manna in the common emulsion, and the addition of a few grains of nitre, is a commodious and often an effectual remedy. The common
emulsion

emulsion with sweet spirit of nitre, or barley-water with gum arabic, may be drank at pleasure; opiates are also sometimes necessary. In a suppression of urine the catheter must be introduced; and of the retroversion of the *uterus* we have already spoken.

At the latter part of the utero-gestation it is not uncommon for women to have an incontinence of urine, not perpetually, but occasionally, when they stand upright, or have any sudden though slight motion, especially if they have a troublesome cough. As far as either the stranguery or incontinence of urine depend upon the pressure of the enlarged *uterus*, it will only be in our power to alleviate them: for the cause must remain till the time of delivery; and the peculiarity of the complaint may be owing to the compression being casually made either upon the neck or *fundus* of the bladder. It is some comfort to women to be informed, and I believe the observation is generally true, that affections of this kind are never produced, except in those cases in which the presentation of the child is natural.

SECTION XV.

THE *fluor albus* was before mentioned as a complaint to which women were at all times liable; but in pregnancy the discharge is sometimes exceedingly profuse, and has very much the appearance as if it was caused by, or accompanied with, inflammation. It may then be occasioned by some extraordinary fulness of the parts adjoining to the *uterus*, or by more than usual irritation. It does not appear that any bad consequences, either to the mother or child, follow this complaint, or that it requires any peculiar treatment. Perhaps, by the relaxation of those parts which are to be dilated at the time of parturition, they may make less resistance; at least it is commonly observed that women who suffer much from this symptom during pregnancy have easy labours.

SECTION XVI.

No complaint happens more frequently to pregnant women than pain in the hips, with numbness of the inferior extremities. This seems to be occasioned by the untoward pressure made by the enlarged *uterus* upon the ischiatic nerves, and those which pass through the perforations on the anterior part of the *sacrum*. As it is found to be increased in certain positions of the body, especially when the patient is accustomed to sleep on one side, a change of the position generally affords temporary relief. At all events it is not in itself of sufficient importance to require any medical assistance, and is entirely removed soon after delivery. Erratic pains in various parts, especially about the face, ears, and teeth, so often occur in pregnancy, as to be thought certain indications of that state. They are evidently occasioned by uterine irritation; and, although they will sometimes be eased by *æther*, by solutions of *opium*, or other such local applications, or by blisters applied behind the ears, yet these commonly afford only temporary relief, and in some instances they aggravate the pain. The same ob-
servation

has been observed to follow this complaint; but if any thing is required to be done, it should be with the intention of emptying the vascular system, as moderate bleeding, gentle purging, and a spare diet. In some cases it may be judged necessary to give support, by moderately tight bandage, to the veins of any part which are particularly distended.

SECTION XVIII.

INQUIETUDE and want of sleep are very troublesome complaints towards the conclusion of pregnancy. They are also frequently attended with slight pains in the region of the *uterus*, and other feverish symptoms. These are most grievous in the night, the patient being restless, in spite of a strong disposition to sleep, and obliged to rise frequently, and expose herself to the influence of the cool air; yet, I know not for what reason, after a short repose at the dawn of day she appears as much refreshed as after the most quiet night.

Perhaps the confinement of the air of the room, and the heat of the bed, may be the immediate

mediate causes of these complaints; but I have generally considered them as arising from the constant and strenuous demands for nourishment made by the child upon the constitution of the parent: for it is remarkable that those women who suffer most on this account, though reduced in appearance, bring forth lusty children, and have easy labours. But if the mother has little uneasiness, and grows corpulent during pregnancy, the child is generally small; and, if the child should die before the time of parturition, the inquietude entirely ceases. In the first case the absorbing powers of the child seem too strong for the parent; but in the latter the retaining powers of the parent are stronger than the absorbing ones of the child; so that on the whole it appears natural that women should become thinner when they are pregnant.

Nothing affords more effectual relief to patients troubled with this inquietude than bleeding in small quantities, with the occasional use of cooling and laxative medicines. *Hoffman's* anodyne liquor, to the quantity of forty drops, given in some common emulsion every night at bedtime, has been useful. Preparations from *opium* have little effect, unless they are given in large quantities and often repeated; but a persuasion

that these are ultimately injurious to the *fœtus*, or to the parent, has long deterred me from using them. A glass of cold water drank at bed-time is not a contemptible remedy; or a towel dipped in cold water and wrapped round the hand, with one corner hanging over the edge of the bed, has many times been serviceable in procuring sleep, by lessening the general heat of the body.

S E C T I O N XIX.

VERY few women, even those who are on other occasions patient and resolute, pass through the time of utero-gestation without using expressions which indicate some degree of apprehension for their safety. This solicitude may proceed from the mere dread of what they expect to suffer at the time of labour; or from reports inadvertently made of untoward accidents which have happened to some of their friends or acquaintance, who were under the same predicament with themselves.

It is sufficient, in the first instance, to contrive amusements for them, or to inspire them with confidence,

confidence, by pointing out the fortunate event of the generality of these cases, and to impress them with favourable sentiments of the skill of the person who is appointed to attend them. Sometimes, however, this apprehension of danger arises from another source, and is caused by uneasy sensations which they feel, but cannot well describe. Then it is really a symptom of disease, and may be ranked with the terror which attends the commencement of some dangerous diseases, of which it is one of the worst indications. Instead of considering it as an hysterical affection not worthy of regard, we shall find, on inquiry, that the patient has some degree of fever; as increased heat, a white tongue and a quick pulse, and frequently a fixed pain in some part of the *abdomen*; or peripneumonic symptoms; or some marks of general disturbance in the habit, though not in a degree sufficient to denote any particular disease. By bleeding in small quantities, by cooling and diaphoretic medicines, by repose and a well-regulated diet, both the sensation and apprehension may be removed before the time of delivery, and a happy recovery from childbed ensured. If the complaint is not properly considered, but slighted or ridiculed merely as lowness of spirits, the event may prove

unfavourable; and on the recollection of the circumstances there may be room to lament that it was misconstrued or disregarded.

SECTION XX.

THE functions of the brain are often disturbed in the time of pregnancy, by which head-achs, drowfiness and vertiginous complaints, are occasioned; and sometimes pregnant women have a true *hemiplegia*. These have usually been ascribed to a fulness of blood in the vessels of the brain, caused by an obstruction to its descent to the inferior extremities, by the compression of the enlarged *uterus*. But these do not more commonly happen to those women who are of full habits of body than to those who are feeble and debilitated; and if this was the cause the effect must be pretty generally produced when women have arrived to a certain time of pregnancy. The palsy is always preceded by such symptoms as indicate an uncommon degree of uterine irritation, on which it is reasonable to consider it may depend; more especially as it is never cured during pregnancy,
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and scarcely ever fails to leave the patient perfectly free soon after delivery, as has been proved in a variety of cases.

The blood of those women who become paralytic whilst they are pregnant is always found to have the same appearance as in the most inflammatory diseases; and the other symptoms indicate the like disposition. It is not therefore surprising that heating and stimulating medicines are observed to increase the complaint; or that it should be relieved by bleeding, by gentle purging, by a cooling regimen, and such means as abate uterine irritation; not regarding the palsy as an idiopathic disease, but as a symptom occasioned by pregnancy.

SECTION XXI.

It was before observed that anasarcaous swellings of the inferior extremities often occurred in pregnancy, and that those sometimes extended to the groins and sides of the *abdomen*, and in some cases to the external parts of generation, which become extremely painful, and tumefied to such

a degree, that the patient is unable to walk without much inconvenience. They appear to be occasioned in some instances by too much, and in others by too little, exercise; but more frequently by the pressure made by the *uterus* upon those lymphatic vessels which are intended to drain the fluids from the inferior extremities. They have sometimes been unjustly supposed to indicate such a general hydropic tendency as might deter us from bleeding the patient, even in circumstances which would otherwise demand it.

But in many of those abdominal complaints, which occur in pregnancy, it has been observed that the patient was sensible of much relief when the legs began to swell; so that in some cases this swelling may be esteemed as a critical deposition upon the inferior extremities of something superfluous or injurious to the constitution. Of the particular treatment which this complaint may require we have before spoken.

SECTION XXII.

THERE have been a few instances of women with child who have had a true *ascites*; and those who have an *ascites* sometimes become pregnant. Some cases are recorded, and many reported, in which the mode of treatment enjoined has been founded on an erroneous opinion of these two situations; that is, of a dropfy being mistaken for pregnancy, and pregnancy for a dropfy. The former is not productive of mischief in any other way than by delaying the use of such means as might be considered likely to cure the disease if administered in its early state. But the consequences of the second error have been deplorable. For, if any active remedies are used on the presumption of a dropfy, the child will of necessity be often destroyed, and an abortion or premature labour occasioned; and when the operation of the *paracentesis* has been performed, it hath proved fatal both to the mother and child, and discredit reflected both upon the operator and profession. It therefore seems necessary to establish this general rule—that no woman at a time of life, or under

under circumstances which, in the most distant manner, subject her to a suspicion of pregnancy, should ever be tapped or otherwise treated for a dropfy, till, by examination *per vaginam*, or by waiting a due time, we are convinced that she is not pregnant; even though she may have before undergone the operation.

It has been said, but whether upon sufficient authority I know not, that a dropfy has sometimes been cured by pregnancy.

SECTION XXIII.

THE manner in which the *abdomen* is distended, with the degree of its distention at different periods of pregnancy, has already been described. This generally appears to be uniform, though often on one side more than the other; and sometimes there are partial distentions, which are popularly attributed to the head, elbow, or some other limb of the child, originally placed, or accidentally moved, out of the common situation. It appears that this opinion cannot possibly be true, unless we presume that there is at the same

same time a partial distention of the *uterus*, which could scarcely happen without some important and dangerous consequences. As this case most frequently happens when the *abdomen* is enormously distended, and as it has all the appearance of a ventral *hernia*, it is more probable that it is occasioned by the starting of some of the abdominal muscles, or the partial yielding of the integuments. But the explanation of the case is of less importance, as it neither requires or admits of any assistance either before or at the time of labour, and disappears almost immediately after delivery.

From the great distention of the *abdomen*, especially in corpulent women, an umbilical *hernia* is sometimes occasioned, which, depending wholly upon the degree of distention, does not admit of any relief before the patient is delivered; when the elastic truss, properly accommodated to the complaint, is a more easy and effectual remedy than any instrument of the kind which has hitherto been recommended. This seems to be the only kind of *hernia* produced by, or which remains during pregnancy; for, unless the other kinds adhere to the *sac* in which they are contained, temporary relief is afforded by that ascent of the intestines which necessarily follows the enlargement of the *uterus*.

SECTION XXIV.

IN some cases the whole *abdomen* is distended beyond what it is able to bear; the skin becomes inflamed, and sometimes cracks, so that there is a little oozing from various parts. The true skin also cracks when the outside is not altered, by which there remains upon the integuments of the *abdomen* of women, who have had children, a number of small cicatrices, as if the parts had been scarified, or there had been slight longitudinal ulcerations.

For the ease, both of the distention and consequent soreness, some unctuous applications should be rubbed over the abdomen every night at bedtime. The ointment commonly recommended for this purpose is composed of rendered veal fat beat up with a small quantity of rose water.

By the extreme distention of the muscles of the *abdomen* these are often the seat of pain during pregnancy, especially at their insertions; and it requires some attention to distinguish this from the pain which may arise from affections of the *symphysis* of the *ossa pubis*. When the weight of the *abdomen* in pregnant women is very great, and
weakly

weakly supported by the integuments, it becomes pendulous, and occasions the patient much pain and difficulty in walking, and many other inconveniencies. It is then of service, by a napkin or broad bandage, suited to the purpose, passed round the lower part and middle of the *abdomen*, to support it with a moderate degree of firmness, and then by a scapulary to sling the depending weight over the shoulders, by which the patient will be enabled to move and walk about with infinitely less trouble.

SECTION XXV.

INSTANCES sometimes occur of pregnant women being infected with the venereal disease: and we have generally been advised to follow a mode of treatment by which the disease was not intended to be perfectly cured, but moderated and restrained from further progress; leaving the absolute cure to be completed when the patient was recovered from the state of childbed. This method of proceeding has been recommended on the presumption that dangerous consequences would result either to the mother or child, if a quantity

quantity of quicksilver was used, during pregnancy, sufficient to root out the disease effectually from the constitution. If the patient has a *gonorrhæa*, there is clearly nothing in the medicines prescribed, or in the treatment, which can prove hurtful to either at the time of utero-gestation. But if there should be a confirmed *lues*, as mercurial frictions, properly instituted and pursued, are acknowledged to be the most efficacious remedy; or if equal or greater confidence is placed in them than in any preparation of mercury internally given; it is reasonable to think, and the opinion is confirmed by experience, that women might at any time of pregnancy go through a course of them with perfect safety. It is scarcely necessary to observe that mercurial medicines, whether internally given or externally applied, are not at this time used with a view to promote a salivation or any other profuse evacuation, but with the intention of filling the habit with quicksilver, and retaining it as long as it is thought necessary for the extinction of the disease. The utility and propriety of this practice is allowed by those who differ widely in their explanations of the mode in which quicksilver is supposed to operate. I may be permitted to observe that the principal causes of the failure of this medicine to

answer our purpose are either the hurry with which it is at first used, or a conclusion often though erroneously made, that the disappearance of the symptoms is a proof of a perfect cure; whereas it frequently happens that, if the frictions are not continued many days, or even several weeks or months after all the symptoms are gone, there will in a short time be new appearances, which prove the return or existence of the disease.

It has been supposed that a child born of an infected parent could not at the time of birth be exempt from infection, and that the *virus* would be so intermixed with its frame that there would scarcely be a possibility of exterminating it. This is at least a very dubious point; because it has happened to every person engaged in practice in a city or large town to attend patients of this description, who have nevertheless brought forth children which were perfectly healthy. I do not recollect one decisive instance of a child born with any symptoms of the venereal disease upon it; and the contrary, I am persuaded, is often suspected from a knowledge of circumstances which give rise to the suspicion exclusive of the symptoms; though it must be allowed that a child has a chance of receiving the infection in
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the act of parturition, by absorbing the *virus* in its passage over ulcerated surfaces. But, with regard to the first opinion, it may perhaps be justifiable to reason in this manner. If the infection is received it must be at the time of conception, or afterwards. If the prolific particles, either in the male or female, were mixed with the venereal *virus*, the prolific properties would by such mixture be destroyed; but if conception was previous to the infection there seems to be no way in which the latter could be communicated to the child already conceived, all immediate intercourse being secluded by the perfect closure of the *os uteri*.

Children brought forth by parents infected with the venereal disease will often be born dead; but this event may commonly be imputed with more propriety to the severity of the means used for the extirpation of the disease than to the disease itself. *The mother's blood poisoned by Syphilis kills the foetus.*

SECTION XXVI.

WHEN pregnant women have the small-pox, there is much difference in the opinions entertained of the possibility of the child being infected. Some have contended that, if the mother has this disease, the child could not escape; whilst others are persuaded that the child could not, according to the laws of the animal economy, receive this disease. Cases are recorded by various writers in confirmation of both the opinions; and many instances have been communicated to me by men of integrity and attention, with the view of deciding this point; but the cases are contradictory to each other, and therefore prevent any present decision upon the subject. When, by the multiplication of well-attested facts, our knowledge is extended and corrected, if it should be proved that the variolous infection is generally received by the *fœtus in utero*, if the parent has the disease when she is pregnant, we may then consider whether the knowledge of the fact can be turned to any practical advantage.

It is an opinion almost universally received, that, if a woman with child should have the small-

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pox,

pox, and miscarry; or, if at the full time her labour should come on during the continuance of the disease; it would necessarily prove fatal to the mother. The event has too often proved the truth of this observation; yet it will probably stand upon more just ground if it is stated in this manner. Should the attack of the disease be violent, and the eruptive fever run very high, patients may and have often escaped the danger, at any period of utero-gestation, though the child were then expelled. But if a woman passes the time of the eruptive fever, and labour or a tendency to miscarry should come on towards the crisis of the disease, as far as my observation enables me to speak, she will then certainly die. She dies, in truth, not because she miscarries or brings forth a child, but she miscarries or falls into labour because she is already in a dying or very dangerous state, and by those circumstances the danger is infinitely increased.

When other diseases occur in pregnancy, the treatment to be directed must be such as the particular disease may require, making due allowances for that state, by not prescribing any violent means, unless the immediate safety of the patient may render them absolutely necessary. Every morbid alteration of importance which happens

happens during pregnancy supercedes, if we may be allowed the expression, all the changes which depend upon that state; and whoever aims to establish the character of a successful practitioner in midwifery must pay attention to the health of his patients when they are pregnant. If there be no disease, or disposition to it, the process of a labour is generally uniform and safe; but if any disposition to disease should exist at that time, the labour may be rendered irregular and painful, and the immediate cause of some disease peculiar to the child-bearing state, not by giving, but by diverting such disposition to some part affected in parturition.

C H A P T E R VII.

SECTION I.

IT was formerly asserted and believed, that the proper situation of the child in the *uterus*, in the early months of pregnancy, was sedentary; with the breech resting at the superior aperture of the *pelvis*, and the fore-parts of the child turned exactly to the *abdomen* of the mother. At or towards the time of parturition it was thought that the child, partly by the increased weight of the head, but chiefly by its own instinct and powers, made a revolution, and turned with its head downwards, in such a manner that the *vertex* was placed to the *pubis*, and the face to the *sacrum*. In this position it was supposed to pass through the *pelvis*. This change was called presenting to the birth, of which it was judged to be the signal; and, from the terms used in different languages to express the change, the opinion seems to have been universal. By the examination of women who have died at different periods of utero-gestation, or in the act of childbirth, it is now ascertained that such as is the situation.

situation of the child in the early part of pregnancy, such it will be at the time of labour, unless the position be altered by some accidental violence. Perhaps this opinion of the ancients was not founded on observation, but on the presumption that fatal consequences would result from the continuance of the *fœtus* with its head downwards for nine months. They did not know that there was a circulation of the blood, and of course were ignorant that particular vessels existed in the body, calculated, by preserving a communication between different parts, to prevent any injury to the *fœtus*, either from its confinement or situation.

The natural position of the *fœtus* in the *uterus* is such as to occupy the least possible space, so that the smallest inconvenience is occasioned to the parent, yet with the utmost ease to its own body and limbs*. In the positions which are esteemed natural there is an endless variety; but they are most commonly after this manner†: the knees

* Quasi in seipsum totus conglobatus.—*Fabric ab Aqua-pendente.*

† Adductis ad abdomen genibus, flexis retrorsum cruribus, pedibus decussatis, manibusque sursum ad caput sublati, quarum alteram, circa tempora vel aurículas, alteram ad genam detinet; spina in orbem flectitur, caput ad genua incurvato collo pro-pendet; tali membrorum situ, qualem in somno per quietem quærimus.—*Harv. Exercitat. de Partu.*

are drawn up to the belly, the legs are reflected backwards, the feet crossed, and lying close to the breech; the elbows are in contact with its sides, and the hands turned up to its head, one of which is often placed upon the cheek or ear. The spine is incurvated, and the neck being bowed the chin rests upon its knees. There is that inflexion of the body into which we spontaneously fall when we seek repose; and, as it is our position before we are born, it is that also to which we have an inclination in the decrepitude of old age.

The situation of a child, presenting naturally, is with the head downwards, resting upon the *pubis*, with one side of the head towards the *abdomen* of the mother, and the other towards the *sacrum*, or in a small degree diagonally. The bulk of the body of the child is not placed against the spine, but on one side, and the limbs turned towards the other, so that the *abdomen* of a woman with child is, in general, evidently distended more on one side than the other. When this circumstance, though a necessary consequence of the proper situation of the child is, observed, a suspicion, wholly groundless, is often entertained, that its presentation at the time of birth will be unnatural.

SECTION II.

THE term of utero-gestation is different in every class of animals, and the diversity has been attributed to the nature and properties of the parents or the offspring. Those, who were of opinion that it depended upon the parent, sought for the reason in the structure or constitution of the *uterus*, the heat or coldness, dryness or moisture of which, according to the doctrines of the old philosophy, were supposed to be the causes of the varieties: yet, if the term depended upon these, it would then remain to be proved how one form or constitution was capable of bearing distention longer than the other. Those, who imputed the time of the event to the offspring, assigned to them the same properties. It seems to have been generally believed, that, by the long or short continuance of the *fœtus* in the *uterus*, the size, duration and qualities, of different animals were influenced; and that these were most perfect in those animals which had the longest period of utero-gestation. It was also thought, and perhaps with truth, that the longer the time of utero-gestation, the longer the animals were

before they came to full growth; and that on this depended their continuance in the mature state, without any natural tendency to decay, one period of existence regulating another. In oviparous animals the time of incubation necessary for the production of their young is not altered by the qualities of the bird by which it is incubated, but follows its genuine nature; as in a hen's egg incubated by a duck. This favours the opinion that the term is guided by the offspring, but it is by no means decisive: for the circumstances relating to the birth of oviparous and viviparous animals, though they may illustrate each other, cannot be compared, after the egg is expelled.

If the time of utero-gestation is not interrupted by accidental causes, it proceeds in all animals with great, though not with perfect regularity, as is proved by those who are employed in breeding cattle, by whom a correct account is usually preserved. But in the human species there was supposed to be a considerable latitude in this respect, and examples have been recorded with great confidence, by grave writers, of children born after a term much exceeding the common, and of others after a term far short of it, which were nevertheless in a perfect state. This opinion
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hath also been countenanced to a certain degree by the laws or customs established in different countries*.

The common time of utero-gestation in women is forty weeks, or nine calendar months; and some men of ability and candour have been persuaded that it is possible for them to proceed as far as ten calendar months. By the laws of this country the term is not precisely limited; so that if any case should occur in which this matter might be litigated, the decision would rather depend upon the circumstances, or upon the confidence placed in the testimonies of the medical witnesses, than upon any proof or conviction of the nature of the thing to be decided.

There must in general be much difficulty in determining with absolute precision the time of utero-gestation in women. But I have met with several instances of those who, from particular contingencies, such as the casual intercourse with their husbands, or their return at, or absence from them, for a particular time, have been able to tell exactly when they became pregnant; and none of these have exceeded forty weeks. I am

* Spigelius Ulpianum juris consultum immerito reprehendit, quod post decimum mensem editum neminem, ad legitimam hæreditatem admisit, — *Harv. Exercit. de Partu.*

therefore

therefore persuaded that the term of utero-gestation is as accurately limited in women as in animals. I do not mean that it is completed to a minute or an hour, because the birth of the child may be delayed by a multiplicity of accidents. But parturition will be accomplished, or the parturient disposition will take place, at the expiration of forty weeks from the time of conception. Nor does it seem reasonable that a law of nature, which is not altered by the differences of age, by the diet, by the extremes of climates, by the severities of slavery, or the indulgencies of luxury, should be changed by circumstances of less importance.

But the examples of women who have brought forth their children before the full time of pregnancy are innumerable. As there is no mark in the external appearance, or internal conformation, which enables us to determine with precision whether a child has remained in the *uterus* its full time, this must continue doubtful, except as far as we are able to judge by the general probability, or by the size of the child. So many accidents occur which may give to the *uterus* its disposition to expel the child, that its premature expulsion can never be the occasion of surprise.

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Though it should be allowed that the natural term of pregnancy in women is forty weeks, there will be some difficulty in making the calculation. The disappearance of the *menfes* is usually the first change which occasions a suspicion of pregnancy; and might therefore be esteemed the era from which we are to date its commencement. But, though women are more apt to conceive soon after than just before menstruation, they may become pregnant at any part of the time between the two periods when they did and when they were expected to menstruate. In order to avoid any great error it is customary therefore to take the middle time, and to reckon forty-two weeks from the last act of menstruation.

Women who give suck, and who do not menstruate, sometimes become pregnant, and have no alteration by which they can make any reckoning of the time of their delivery, and all is left to conjecture. But there is usually, in these cases, a short and imperfect menstruation, which denotes the time when the *uterus* was in a state fitted for conception. Some women also have conceived who never did menstruate, or in whom menstruation had been interrupted for many months. We can then only judge of
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the time when they conceived by such symptoms and appearances as shewed that they had acquired the disposition to menstruate, and would have menstruated if they had not conceived.

Some inconveniencies are produced by attempts to make exact reckonings for pregnant women ; for, when the time fixed for their delivery is past, the mistake creates much solicitude and impatience. When therefore it is necessary to give an opinion on this subject it is better to mention some time beyond that which we really suppose ; or, on the whole, it would perhaps be better that labour should always come on unexpectedly.

SECTION III.

AT the expiration of forty weeks the process of labour commenceth ; and various opinions have been given with a view of explaining its causes. Of these opinions, which have been supposed to constitute a very important part of obstetric knowledge, we should not be ignorant,

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as it appears that the practice of midwifery has really been much influenced by them.

It was said by all the ancient writers, that a child was born by its own efforts, which it was incited to make by the necessity it felt of breathing cool air, for the purpose of moderating that heat which was generated by its long confinement in the *uterus*; or by the want of nourishment, the sources of which failed, or became depraved; or by the acrimony of the *meconium* and humours of its own body. By some the cause assigned for the exertions of the *fœtus* was the want of room for its further growth and enlargement; and that by its efforts it escaped out of the *uterus* as out of a prison in which it had been constrained. By others it was presumed that there was some analogy between the ripeness and falling of fruit and the perfection and birth of a child. The peculiar cause was unimportant: but, from a general persuasion of the principle, it was presumed that the ease or difficulty with which labours were completed depended upon the strength or activity of the child. Another conclusion certainly followed: when the child was feeble the labour must necessarily be slow; and in cases of unusual difficulty we might be assured that the child was dead,

dead, or could not possibly be saved. Of course, whenever the assistance of art was required there was no occasion to regard the child, the existence of the difficulty proving the death or impossibility of preserving the child. If we had no other circumstance by which the practice of the ancients could be compared with that of the moderns, this alone would decide in favour of the latter. Many expressions are, however, in use at the present time which are founded on this opinion of the ancients; and it is not clear that practice is not, in some instances, yet influenced by it.

No fact is more incontestably proved than that a dead child, even though it may have become putrid, is commonly born after a labour as regular and natural in every part of the process as a living one; and that children, after labours accomplished with the most extreme difficulty, will often be born not only living but in perfect health. There must then be some other principle of birth besides the efforts of the child, which in fact appears to be wholly passive.

It was by later writers supposed that the child was expelled by the action of the *uterus*, aided by that of the diaphragm and abdominal muscles. This doctrine, which I believe was first advanced
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by *Fabricius ab Aquapendente* *, is the basis of all the modern improvements in the practice of midwifery; and it is so indisputably proved, by the occurrences both in natural and difficult labours, that its truth is now almost universally admitted.

Ingenious men were not satisfied with the observation of the fact, but they endeavoured to discover the principle of the action of the *uterus*, and to assign reasons for its coming on at a particular time. It was surmised that this expulsoy action of the *uterus* depended upon its form or structure, or its inability to bear further distention; or upon its heat or coldness, dryness or moisture; or upon the distinction of its muscular fibres, which were said to be arranged in a peculiar direction; or to the effort to menstruate when the vessels of the *uterus* were incapable of containing a greater quantity of blood than was already collected in them. Of these and many other opinions it would be useless to debate; but, as all viviparous animals bring forth their young at regularly stated times, and by processes generally alike, it would not be judging according to any philosophical rule to attribute as a cause of par-

* Simul expultrix uteri facultas extemplo insurgit, et excitatur.—See *Cap.* lxxxvi.

turition, or of parturition at any certain time, a circumstance peculiar to any individual class of animals.

The opinions of men upon the same subject are often in direct opposition to each other : and some, fearful that truth is not to be found in either extreme, have steered a middle course between the doctrine of the ancients and moderns. These have supposed that childbirth is not completed solely by the efforts of the child, or by those of the parent, but by the conjunction of their efforts. Of this opinion, which participates of the error of the ancients, there have been few supporters ; and the arguments in its favour have been drawn from observations made in the first instance on vegetables and oviparous animals. How far the discovery of the particular cause of the birth of a child might lead to the improvement of practice it is impossible to determine. The knowledge of the fact, that children are expelled, has evidently been productive of much advantage ; but the attempts to investigate the cause do not give us more satisfaction than old *Avicenna*, who, with great humility and devotion, says “ At the appointed time labour comes on by the command of God.”

SECTION IV.

It was before observed, that pregnancy and parturition have usually been mentioned as distinct operations of the constitution. But it seems better to consider every change in the animal economy, from the time of conception to the birth of the child, as forming a single process, consisting of several parts, each perfect in itself, and at the same time a cause of some subsequent change, necessary for the completion of the whole; and, though there is no precise line to the different parts of this process, they readily admit of distinctions, by which they are more easily comprehended and more expeditiously described. Thus, previous to the act of parturition, many changes take place in the constitution which indicate its approach; and these have been called the pre-disposing signs of labour. The time of their appearance is different, being in some women several weeks, and in others only a few days, before the commencement of labour: but they universally take place, unless the labour be precipitated by some accidental influence: and the more perfectly these changes are made, and

the longer the time of their preceding the labour, the more natural and kindly will the process generally be.

There is, first, a gradual subsidence of the *fundus* of the *uterus*, and whole *abdomen*, so that women often appear, and really are, less in the ninth than in the eighth month of pregnancy. This is a good indication, because it shews that the *fundus* and all the other parts of the *uterus* are disposed to act; and on the equality of this disposition the efficacy of its action will very much depend. When there is none, or but little, subsidence of the *abdomen*, and the patient complains, even in the time of labour, that the child is very high, it is always unfavourable; being a proof that the *fundus* of the *uterus* is then in an inactive state.

There is, secondly, a discharge of *mucus* from the *vagina*, which in the beginning is of the kind often observed in the *fluor albus*; that is, a mere augmentation of the secretion from the glands of the *vagina* and neighbouring parts; but, by a gradual alteration, in some instances it becomes extremely viscid and tenacious. This is very remarkable in some animals whose bodies are exposed to view; and it is a sign that the parts concerned in parturition are in a state disposed to dilate,

dilate, which disposition is improved by the discharge.

Thirdly, In early pregnancy the external parts of generation are in a natural state, or rather more contracted than usual: but when the time of labour approaches there is a gradual enlargement and relaxation of them, with some degree of protrusion. This change is also to be observed in animals only; but, from their complaints, and the representation of their feelings towards the conclusion of pregnancy, there is every reason to believe that a similar change takes place in women.

Fourthly, It was observed that the breasts very readily and generally sympathize with the *uterus* in all its affections, and particularly that they are enlarged immediately after conception. There is also a gradual change in them from that time to the approach of labour, when they are perfectly fitted for the secretion of milk; which, when secreted in a more mature state, or in an increased quantity, may be esteemed a sign that the time of labour is drawing near. In a few instances animals have continued to give suck during pregnancy, without any apparent alteration in their milk, till they approached the time of parturition, when it was found to be much changed in its consistence, colour, and proper-

ties, a new mode of secretion being evidently established.

Fifthly, By the insertion and disposition of the sacro-sciatic ligaments the principal firmness is given to the connexion of the bones of the *pelvis*. In animals not with young these ligaments are very strong and rigid, and make a resistance to any external pressure almost as firmly as if they were ossified. But when the time of parturition is at hand their strength and rigidity gradually decline, and they scarcely make greater opposition than a duplicature of the skin. In consequence of this relaxation of the ligaments, animals change their manner of walking, by projecting the weight of the body on each side alternately, rather than by advancing the feet. There is such an appearance as justifies the use of the popular expression; for they literally seem *falling in pieces*. In women these changes cannot be so well observed; but there are many reasons to be drawn from their manner of walking, and from their representations, which would induce us to believe that similar ones take place in them as well as in animals *.

* Sacri et pectinis ossium cum coxendice copula, quæ fit per synchondrosin, adeo emollietur et solvitur, ut dicta ossa facile exeanti fœtui cedant et hiantia regionem totam hypogastricam ampliorem reddant.—*Harv. Exercitat. de Partu.*

Sixthly,

Sixthly, All animals, wild or domesticated, assiduously endeavour to provide a safe and comfortable habitation for their young, when the time of bringing them forth draws near*. The actions of mankind are always attributed to, and usually proceed from, more dignified and commendable principles than those of animals. But in many natural actions, which are too powerful to be controlled, or not without great difficulty, by instructions, manners or customs, those may often be observed to act instinctively; and this is in no case more remarkable than in such actions as relate to their children. From instinct, therefore, and not reason, it may be presumed that the chosen and favourite employments of pregnant women are those which in some way or degree relate to the expected blessing; and that an unusual solicitude about the preparation of such things as may be necessary or convenient to the child, in the advanced state of pregnancy, may be considered as a sign that the time of labour is approaching.

* *Accedente parendi tempestate ad solita loca revertantur: ut stabula vel nidos suos tuto extruant, ubi fœtus pariant, foveant, alantque.*—*Harv.* Exercitat. de Partu.

SECTION V.

BEFORE we proceed to the history of labours it is necessary that we should speak of the operation, if it deserves the name, by which we are to acquire our information. This is described by the term examination, or examination *per vaginam*. When instituted at the time of labour it is popularly called *taking a pain*, which explains the opinion entertained of it by women. Concerning the operation two things are to be observed; first, the manner in which patients are to be examined; and, secondly, the information to be gained by the examination.

The position in which women are placed when it is thought necessary to examine them varies in different countries. In some the examination is made when they sit in a chair or stool contrived for the purpose; in others when they kneel by the side of a bed; and in others in a recumbent position. But in this country, at the present time, almost universally, women repose on a couch or bed, upon their left side, with their knees bent, and drawn towards the *abdomen*; and this is by far the most convenient. It is not requisite,

quisite, or possible, to enumerate every circumstance to which it is necessary to pay attention; but it must be an invariable rule, never to propose an examination *per vaginam* but as a matter of absolute necessity. It is also to be performed with the utmost care and tenderness, and the strictest regard to decency; for, unimportant as the operation in itself really is, an opinion is formed of the skill and humanity of the practitioner, and of the propriety of his conduct, by his manner of doing it.

An examination *per vaginam* may be needful to discover and distinguish diseases of the *uterus* and contiguous parts; to ascertain whether a woman be pregnant, or how far she is advanced in her pregnancy; to determine whether she be in labour, or what progress she has made; if the presentation of the child be natural; if the *pelvis* be well formed or distorted; and on many other occasions.

The state of the parts examined, under all the incidents before recited, is different from the natural; but of the deviations of every kind, and in every degree, it is impossible to form a judgment, unless we have previously obtained an accurate idea of their natural state. This becomes a standard by which we are to judge of every

change, natural or morbid; and the discrimination of the various diseases can only be acquired by frequent practice, no abstract rule being sufficient for the purpose. It may indeed be said that, in some diseases of the *uterus*, especially those disposed to become cancerous, the *os uteri* is indurated, thickened, fissured, uncommonly tender when touched, and patulous, or with the *labia* somewhat reverted. But in others, as the *polypus*, hydatids, inflammation, or glandular enlargement of the *uterus*, the state of the parts, or the sensation they give, cannot be described by words, without an antecedent agreement what those shall be called which we have before felt or seen.

As it is extremely difficult, if not impossible, to determine, by an examination *per vaginam* in the early part of pregnancy, whether a woman be with child, it is prudent to evade the operation; because it is always expected that we should afterwards speak with precision and confidence. The *fundus* of the *uterus* is the part first distended in consequence of conception; and the *cervix*, which is the only part we can feel, does not begin to shorten in any distinguishable way before the termination of the fourth month of pregnancy; not to mention the varieties in the structure

structure and size of the parts in different women, and the alterations which may be caused by the attachment of the *placenta* to different parts of the *uterus*; or in those diseases which resemble pregnancy. A cautious practitioner would not, therefore, examine before that time, because he cannot gain information to supply him with proper ground on which to form an opinion that will not be extremely subject to error. Perhaps this limitation may not be sufficiently strict; and it is better to say, in general terms, that the longer we defer the examination the greater probability there will be that we shall not be deceived. In all cases likewise of doubtful prognostic it is proper to avail ourselves of every advantage which a knowledge of the collateral circumstances can afford,

Nor is there less difficulty, when we are assured that a woman is with child, in deciding, by an examination *per vaginam*, how far she is advanced in her pregnancy. An opinion of this must be formed on the estimation we make of that portion of the *cervix uteri* which we suppose should remain undistended at any individual period of pregnancy. But as the *cervix uteri* naturally varies in its length in different women, of course the portion which remains undistended at
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any one time must vary ; and all that can be said upon the subject will only deserve the name of conjecture. It is therefore more prudent not to hazard an opinion singly upon the information gained by an examination *per vaginam* when any determination of importance is to be made ; but, as in the former statement respecting the existence of pregnancy, to act with caution, and to collect all the information we can get from other circumstances, before we presume to give a decided opinion.

When a woman is at or near the full period of utero-gestation it may be determined whether she is in labour by the state of the *os uteri*. By the dilatation of the *os uteri* during the continuance, and not by its relaxation in the absence of a pain, we are to judge that the patient is in labour : for a considerable degree of relaxation of the *os uteri* is sometimes found to take place several days, or even weeks, before the commencement of labour, though it is generally in a contracted state till it is distended, in consequence of the pressure made by some part of the *ovum* urged upon it by the acting *uterus*. By the time which has been required to produce a certain degree of dilatation, we may guess with tolerable exactness the general duration of a labour, provided

provided the action of the *uterus* should continue with equal energy; because on this, as well as on the state of the parts, the progress of a labour must depend. But so many unexpected circumstances occur which may accelerate or interrupt a labour in its progress, that it is a proof of wisdom to be silent upon this subject, at least not to advance our opinions with confidence, but to propose them, when demanded, with hesitation and reserve.

The manner in which the child presents may generally be discovered by an examination in the beginning of labour; for, though we should not be able to distinguish any part through the membranes, in the intervals between the pains (when only the attempt ought to be made), if the head presents it may be perceived through the anterior part of the *cervix uteri*, resting upon the *pubis*, in some cases so early as the fifth month of pregnancy: when any other part presents we can in general only discover through the membranes that it is not the head, by its smallness and the want of that resistance which is made by the head: and if we can feel no part presenting, though it does not certainly follow, we may presume that it is not the head; and then we shall be prepared to give assistance at the time when

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the membranes break, if the presentation should be such as to require it.

After an examination *per vaginam*, our opinion is constantly demanded as to the prospect of an easy or difficult labour. If the presentation of the child be natural, the *pelvis* well formed, the soft parts in a relaxed state, and the patient free from disease, we may safely assure her friends that all the appearances are promising, and that the labour will be finished, in all probability, with perfect safety both to the mother and child. But of the slowness or celerity of a labour great experience and attention can only give that maturity of judgment which enables us to form an opinion with tolerable precision; yet the same experience, having often shewn the uncertainty of any determination, will point out the propriety of leaning rather to the side of doubt than of confidence.

CHAPTER VIII.

SECTION I.

ON LABOUR.

HAVING given a description of all the parts concerned in parturition, and enumerated the principal alterations produced in the constitutions of pregnant women, and having taken notice of all the previous changes, we come in the next place to the consideration of a *Labour*. This term is generally used to signify every act performed with difficulty or pain; but by long established custom* it has been appropriated, in this and many other countries, to parturition, the circumstances of which it is well suited to describe.

Before we proceed to the history of labours it is requisite that we should divide them into classes or kinds; and, though objections might

* Septem ego per noctes, totidemque cruciata diebus,
Fessa labore.

Ovid. Metamorph. lib. xiv.

be made to a very strict arrangement, some appears to be both convenient and necessary, for the purpose of enabling us to convey our sentiments with perspicuity to others, and for real use in practice.

With these intentions, labours may be divided into the four following classes :

1. Natural.
2. Difficult.
3. Preternatural.
4. Anomalous.

Under one or other of these distinctions every kind of labour which can occur may be reduced.

SECTION II.

NATURAL labours, which have had their denomination from their frequency, or from the shortness of the time required for their completion; from the regularity of the manner in which they proceed, or from their being completed by the unassisted efforts of the constitution; form a standard by which we are to judge of every other class. It is therefore necessary that

that we should obtain as precise an idea of them as the subject will allow. We will then say that every labour shall be called *natural*, if the head of the child presents, if the labour is completed within twenty-four hours, and if no artificial assistance is required.

Should any of these three leading marks of the definition of a natural labour be wanting, it must come under some other denomination. Thus, if any other part except the head should present, the labour would be *preternatural*; if it should be prolonged beyond twenty-four hours it would be *difficult*; and if artificial assistance were required, though the labour might be completed within one hour, it would be *anomalous*, or must be referred to some other class.

The presentation of the head of the child constitutes an essential part of the definition of a natural labour; yet this may happen in various ways. The most common position of the head, and that in which it is expelled with the greatest facility, is when the hind-head is disposed to turn towards the *pubis* and the face towards the hollow of the *sacrum*. But the face is sometimes inclined towards the *pubis* and the hind-head towards the hollow of the *sacrum*; or there may be an original presentation of the face; or one or both arms may descend together with the head.

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These differences in the position of the head do not create labours of another class; but they are to be considered merely as varieties of natural labours, provided the other circumstances correspond; experience having fully proved that, in any of these positions, the head may be expelled by the natural efforts with perfect safety to the mother and child, though not with such ease and expedition as if the hind-head was turned towards the *pubis*. It must also be observed, though another part of the definition be taken from time, that it is possible for one woman to make greater efforts, and to undergo more pain, in two hours than another may in twenty-four. Then the definition will be imperfect; as almost all general distinctions must be when they come to be examined and tried by individual cases.

A natural labour was the last thing well understood in the practice of midwifery; because scientific men, not being formerly employed in the management of common labours, had no opportunities of making observations upon them. Practitioners were then engaged in qualifying themselves for the exercise of their art whenever they were called in to give assistance; and not in making nice distinctions, or investigating the particular cases, in which only it might be necessary to exercise it.

SECTION III.

WE have before given an account of the changes which precede labours, and are now to give a detail of the symptoms which accompany them.

The first symptom which indicates a present labour is anxiety, apprehension of danger, or doubt of safety. This does not seem to be confined to the human species, but to be common to all creatures; as they universally shew signs of dejection and distress at this time, though they suffer in silence; and even those animals which are domesticated strive to conceal themselves, and refuse all offers of assistance. This anxiety, which is probably occasioned by the first changes made upon the *os uteri*, and by the consent between the vital organs and that very irritable part, is often exceedingly increased by an original timidity of disposition, especially with first children; or by the discovery of untoward accidents happening to other women under the same circumstances, with whom a similarity of situation is the cause of a most interesting sympathy. From motives of humanity, as well as

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professional propriety, it is therefore at these times necessary, by steady conduct, and by arguments suited to the patient's own notions, or the peculiar cause of her fears, to remove her apprehensions ; and, by soothing and encouraging language, and by attention to her complaints, though not indicative of any danger, to afford her every consolation in our power. This anxiety is greatest in every woman in the beginning of labour ; for the sharp pains which attend its progress generally excite other sentiments in her mind. But we are at all times to be on our guard, that her fears or supplications for relief do not prevail with us to attempt to give assistance when our interposition is not required, and when it must necessarily be productive of mischief.

2. At the commencement of labour, and sometimes on the return of every pain, women have frequently one or more *rigors*, with or without a sense of actual cold. These are not to be considered as signs of the accession of disease, but as the effects of an increased irritability spread through the whole frame ; or perhaps as proofs that all the powers of the constitution are summoned to contribute towards the important process which is carrying on. These *rigors* are void
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of danger, and they are most apt to occur when the *os uteri* begins to dilate, and when it is upon the point of being fully dilated. But in the course of a labour, in all other respects natural, when there is one strong and distinct *rigor*, it is often followed by some disease, dangerous either to the mother or child.

3. When the head presents, and scarcely in any other position of the child, women have generally some degree of strangury in the latter part of pregnancy; and this symptom is increased on the approach of labour, by the pressure of the descending head upon the *cervix* of the bladder. Should the pressure be very great, or of long continuance, a suppression of urine may be occasioned before or in the time of labour. To prevent the inconveniencies which might arise from a distention of the bladder, either to the part itself, or by obstructing the passage of the head, it is necessary to urge the patient to void the urine frequently; and, in case of a suppression, to give relief by introducing the catheter. On the other hand, should the pressure by the head be made upon the *fundus* of the bladder, there will be an involuntary discharge of the urine at the time of her enduring every pain; or, if there should be any extraordinary agitation

from a cough, or any similar cause, there will be the same consequence, which is very troublesome, but not dangerous.

4. It is not unusual for patients to have a *tenesmus*, or one or two, or more loose stools in the beginning or course of a labour. Both these symptoms may be occasioned by the consent between the *os uteri* and the *sphincter* of the *anus*, or by the pressure made upon the *rectum*, as the head enters into or passeth through the *pelvis*. There is in the minds of all women a popular prejudice and unreasonable dread of complaints in the bowels, through every stage of pregnancy, parturition, and childbed; and of course there is never any objection, but, on the contrary, a willingness to use such means as are advised to suppress them, or restrain any disposition to a *diarrhæa*. The error has arisen from their confounding the looseness, which often accompanies the last stage of the puerperal fever, with that which proceeds from any other cause. But the *diarrhæa* which attends the beginning or course of a labour is so far from occasioning or from proving any danger; that the patient is evidently relieved by it; a greater freedom being given to the action of the *uterus*, more room made for the passage of the child, and any feverish disposition thereby removed

moved or prevented. If, therefore, the patient should not at that time have stools spontaneously, it is very sound practice to direct one or more emollient clysters for the beforementioned purposes. Nor are those the only good ends which are answered by clysters; for they soothe the parts when too much or improperly irritated, and serve as a fomentation, which, by its warmth and moisture, may give or amend their disposition to dilate. In very slow labours, when the head of the child has dwelt for a long time in one position, it is not unusual for the patient to have one or more loose stools immediately before the advancement of the head, after which the labour is soon concluded.

5. The uncoloured mucous discharge from the *vagina*, which pretty generally occurs before labour, on its accession is usually tinged with blood, or a small quantity of pure blood is discharged. This sanguineous discharge, which varies in quantity and appearance in different women, is popularly called a *show*, and it happens more particularly at two periods of a labour; when the *os uteri* begins to dilate, and when it is finally dilated. In the first instance it is probably occasioned by the separation of a few of those vessels by which the membrane, which connects the

ovum to the *uterus*, was originally bound; and in the second by the effusion of some blood before extravasated in the substance of the *os uteri*; for this part in some cases acquires an uncommon thickness from that cause, independent of any edematose or inflammatory tumefaction. In many cases there is no coloured discharge in any period of a labour, and then the dilatation generally proceeds more slowly; for the discharge is not only a sign that the parts are in a state disposed to dilate, but it also improves that state. It is not only in colour or quantity that there is found much difference, either in the sanguineous or mucous discharge, but also in the consistence and tenacity of the latter; it being in some cases thin and watery, and in others thick and extremely viscous.

6. But all these symptoms are not positive proofs of the existence of labour; for we cannot consider a woman as being in actual labour, unless she has the usual pains. Nor does all pain in the region of the *uterus* certainly prove that a woman is in labour, because such pain may be excited towards the conclusion of pregnancy by various causes besides the action of the *uterus*. These pains are therefore distinguished into two kinds, *true* and *false*; but the seat, the manner, and

and the degree of these pains, often resemble each other so nearly, that it is very difficult or impossible to distinguish them; and we are obliged to wait for the event, before we are able to decide.

The *true* pain of labour usually begins in the loins, or lower part of the back, surrounds the *abdomen*, and terminates at the *pubes*, or upper part of the thighs; and it sometimes observes a quite contrary direction. In some cases the pain is confined to one particular spot, as the back, *abdomen*, thighs, or inferior extremities; in others the pain is seated in some part far distant from the *uterus*, as in the knees, heels or feet. In some the stomach is affected; in others, though very rarely, the brain; and then convulsions, or some derangement of its functions, are brought on. In short, the varieties of pain are innumerable; and these are explained by what we really do know, or fancy we know, of the influence of the nervous system.

The pain attending a labour is periodical, with intervals of longer or shorter duration, according to the action of the *uterus*, on which it depends; and the more the pains are multiplied the better it is for the patient. For, if an effect of great importance to the constitution is to be produced,

the more slowly it is made, provided the slowness of the progress does not depend on any morbid cause, the more gradual will be the change, and of course the danger which sudden violence might produce be avoided or lessened; the division of the pain being equal to the diminution, nearly in the same proportion as rapidity is an addition to force. It is an old observation, confirmed by daily experience, that, after the completion of slow or lingering labours, patients usually recover better than after those which are quick; not to mention that they are less liable to the untoward accidents which precipitation may immediately produce.

Those who endure any kind of pain express their suffering by some peculiarity of manner, or by some tone of voice, which to a nice observer will generally discover the part affected, together with the kind and degree of pain. Sharp pain is universally expressed by an interrupted and acute tone of voice; obtuse pain by a continued and grave tone, unless the expressions are controlled by an acquired firmness of mind, which on particular occasions may enable it to rise above the infirmities of the body. The expressions of pain uttered by women in the act of parturition may be considered as complete indications of the state
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of the process, so that an experienced practitioner is as fully master of the state of his patient, if he hears her expressions, as by any other mode of examination. He must however understand and make allowances for the peculiarities of different patients, or he will be deceived; because in tender constitutions, the sensations being quick and the resolution faint, the mode of expression will be according to the sense, and not in proportion to the degree of absolute pain.

In the first stage of a labour the change consists in the dilatation of the parts. Forcible or quick dilatation gives a sensation similar to that produced by the infliction of a wound, and it is equally expressed by an interrupted and acute tone of voice. These are popularly called *cutting* or *rending* pains. When the internal parts are dilated, and the child or contents of the *uterus* begin to descend, the patient is by her feelings obliged to make an involuntary effort to expel; and the expressions are then made with a continued and grave tone of voice, or she is mute. These are called *bearing* pains. But there is an intermediate period of a labour, in which there is in the first instance some degree of dilatation, and afterwards an effort to expel; and then there will be the expression which denotes sharp pain, combined,

combined, or immediately succeeded by a graver tone of voice. When the child first begins to press upon and to dilate the external parts, the expression becomes again acute and vehement; and, lastly, the expulsion of the child is accompanied with an outcry of suffering beyond what human nature is able to bear; or the pain is endured with silence. The knowledge of these circumstances, though apparently trifling and contingent, is really of some importance in practice, and permanent; as far, at least, as the freedom or restraint of the breathing can operate. If, for example, on any principle the patient was induced, in the beginning of labour, to retain her breath, and to make strong efforts to expel, the order of the labour would be inverted, as it would also when the parts were dilated and the expul-
satory power wanted, if she should exclaim.

The pains of labour or childbirth, and the action of the *uterus*, are terms used synonymously; but they are not exactly the same thing. The action of the *uterus*, by which its contents are compressed into a less space, and would be excluded if there was any opening for their passage, first takes place as a cause; and this does not seem to be attended with pain. When some part resists the passage of the contents of the

uterus, the exclusion of which is the effect to be produced, there will then be pain proportionate to the action, to the sensation of the resisting part, and the resistance made. There is no way by which we can estimate the degree of force but by the resistance; nor the resistance but by the pain attending it; nor the pain but by the expression. Judging by induction of the force exerted, by the expression of the pain, we say in common language a weak pain, a strong pain, or a woman is delivered by her pains; and the purpose of conveying our meaning is answered, though the expressions are not strictly legal. We may suppose the parts through which the child must pass so perfectly disposed to dilate, that they would make little or no resistance to the excluding force, and then a woman would be delivered with very little or no pain. This observation will not only discover the reason of the great advantage obtained by a labour being slow and lingering; why some women are delivered comparatively without pain; but, with this perfect disposition to dilate, if the patient should be asleep when the action of the *uterus* came on, the possibility of her being delivered before she was quite awake.

In the conversation of those who attend labour it is often surmised that women have much unprofitable

unprofitable pain. This statement is not only unfair as to the fact, but the language is very dispiriting; and it is often assigned as a reason for an interposition altogether unnecessary, and often injurious to the mother or child. No person in labour ever had a pain which was in vain. It may not be equal to the accomplishment of the effect we want, or at the time we wish, but every pain must have its use, as preparatory to, or absolutely promoting, the effect; and, as we are not able to comprehend every possible cause of every state, by endeavouring to remove what appears to be one slight ill, it often happens that we occasion many, and those of greater consequence.

Though the pains of labour return periodically, the intervals between them are of different continuance. In the beginning the pains are usually slight in their degree, and have long intervals; but as the labour advances they become more violent, and the intervals are shorter. Sometimes the pains are alternately strong and weak, or two feeble and one strong; and there is reason to think that every variety has its advantage, by being suited to the apparent or real internal state of every individual patient. In every circumstance which relates to natural parturition

turition it is impossible not to see, and not to admire, the wisdom and goodness of Providence, in ordaining the power and fitting the exertion to the necessities of the situation, with a marked respect to the safety both of the mother and child. This perfect coincidence between the cause and effect should afford a lesson of patience to those persons who when in labour become intractable, and, by losing their self-possession, add to the unavoidable evils of their situation; and to those practitioners who, being led away by popular errors, aim to add to the strength of the pains, or to quicken their returns, and act as if they thought there was no other evil but that of a slow labour; an opinion which in its consequence has done more mischief than the most skilful practice ever did good.

SECTION IV.

THOUGH it was said that pain was, properly speaking, a constituent part of a labour, it was also observed that all pain in the region of the *uterus*, though periodical in its returns, was not a positive

a positive proof of the existence of a labour. For whatever disturbance is raised in the constitution, especially in those parts connected or readily consenting with the *uterus*, towards the conclusion of pregnancy, it is very apt to induce the symptoms of labour, in a manner which makes it difficult to distinguish between *true* and *false* pain. Yet the good of the patient, as far as relates to the proper conduct of the ensuing labour, may depend upon the justness of the distinction; for if the pain, which is *false*, be encouraged or permitted to continue, the action of the *uterus* would follow, and premature labour be occasioned.

The causes of *false* pain are various; as fatigue of any kind, especially too long standing; sudden and violent motions of the body; costiveness, or a *diarrhæa*; general feverish disposition; agitation of the mind, and a spasmodic action of the *abdominal* muscles. Very frequently also the irregular and strong movements of the child, in irritable constitutions, occasion pains like those arising from the action of the *uterus*. In some cases there is such a close resemblance between *true* and *false* pains, that they cannot be distinguished without an examination *per vaginam*. If, during the continuance of a pain, no pressure
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upon or dilatation of the *os uteri* can be perceived, we may conclude that the pain is not the consequence of the action of the *uterus*; and, whatever likeness it may have, that it is not *true* pain. But if there should be pressure upon or dilatation of the *os uteri* during the continuance of the pain, we may consider it as proceeding from the action of the *uterus*, and be persuaded that the patient is really in labour. In a few cases I have known the action of the abdominal muscles so regular and strong that the whole volume of the *uterus* has been heaved up and down alternately, in such a manner, that it was scarcely possible to distinguish between this strange succussion and the proper action of the *uterus*.

The means to be used for the relief of *false* pain must be guided by the cause. When it is occasioned by fatigue of any kind, immediate ease will often be gained by a short confinement in an horizontal position. In plethoric habits, or with a feverish disposition, it will be necessary to take away some blood; and, when the patient is costive, to procure stools by emollient clysters or gently opening medicines. In every case, when means adapted to the apparent cause have been used, it will be proper to give an opiate proportioned

tioned to the degree of pain, or to repeat it in small quantities at proper intervals till the patient shall be composed,

SECTION V.

It has been thought equally incumbent upon the practitioner to promote the power and effect of *true* pain, as it was to quiet that which was *false*. This opinion is perhaps more universally popular than any other throughout medicine; and, having infected the minds of practitioners, it has been as injurious as general. From this source may be traced the opinion of the necessity, and the abominable custom of giving assistance, as it is called, by dilating the internal and external parts artificially; of giving hot and cordial nourishment during labour, even in plethoric habits and feverish dispositions, by which the nature of the principle which should actuate the *uterus* is changed, the pains are rendered disorderly and imperfect, and the foundation of future mischief and difficulties is laid. Hence also was derived
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the doctrine of the necessity of patients helping themselves, as it is called, by urging with all the voluntary force they are able to exert beyond the dictates of nature; as if a labour was a trick to be learned, and not a regular process of the constitution. Women should be informed that the best state of mind they can be in at the time of labour is that of submission to the necessities of their situation; that those who are most patient actually suffer the least; that, if they are resigned to their pains, it is impossible for them to do wrong; and that attention is far more frequently required to prevent hurry than to forward a labour. In every thing which relates to the act of parturition Nature, not disturbed by disease, and unmolested by interruption, is fully competent to accomplish her own purpose; she may be truly said to disdain and to abhor assistance. Instead, therefore, of despairing and thinking they are abandoned in the hour of their distress, all women should believe, and find comfort in the reflection, that they are at those times under the peculiar care of Providence; and that their safety in childbirth is ensured by more numerous and powerful resources than under any other circumstances, though to appearance less dangerous.

SECTION VI.

IN order to give a full and distinct view of a natural labour, it is expedient to divide the process into three periods or stages. In the first will be included all the circumstances which occur, and all the changes made, from the commencement of the labour to the complete dilatation of the *os uteri*, the rupture of the membranes, and the discharge of the waters; in the second, those which occur from that time to the expulsion of the child; and in the third, all the circumstances which relate to the separation and exclusion of the *placenta*.

In the beginning of labour the *os uteri* is found in very different states in different women. In some it is extremely thin, and in others of considerable thickness; in some it is rigid and closely contracted, but in others it is much relaxed, and somewhat opened for several days, or even weeks, previous to the accession of labour. In some cases the *os uteri* remains so high that it can with difficulty be reached, in the centre of the superior aperture of the *pelvis*, projected backwards or on either side; whilst in others it is spread thin,
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and pressed very low before it begins to dilate. There is, in short, every variety of state and position which a part constructed and connected like the *os uteri* can be thought capable of undergoing.

The first part of the dilatation is generally made very slowly, the action of the *uterus*, on which it depends, being feeble in its power and slow in its returns; but the more perfect the state of relaxation is, with the greater facility the dilatation will of course be made. This is at first effected by the simple pressure of the contents of the *uterus* upon the *os uteri*; but when the dilatation is made to a certain degree the membranes containing the waters of the *ovum* are insinuated within the circle of the opening *os uteri*, and form a soft pillow, which, at the time of every pain, acting upon the principle of a wedge, operates with increasing force according to the size it acquires; in consequence of which the latter part of the dilatation usually proceeds with more expedition than the former.

There is no possibility of prognosticating how long a time may be required for the complete dilatation of the *os uteri*; yet a tolerable conjecture, subject however to many deviations, may be formed by a person who has had much experience.

rience. If, for example, after the continuance of the pains for three hours the *os uteri* should be dilated to the size of one inch, then two hours will be required for dilating it to two inches; and three hours more will be necessary for dilating it completely, provided the action of the *uterus* should proceed with regularity and with equivalent strength. But in some cases the *os uteri* will abide in nearly the same state for several hours; and when the dilatation begins it will soon be perfected. In others, after a certain degree of progress, the action of the *uterus* will be suspended for many hours, and then return with great vigour; so that all which can be said on this subject is mere conjecture.

With first children this stage of a labour often makes the most tedious and important part of a labour, both on account of the time requisite for completing the dilatation of the *os uteri*, and because the accompanying pain is more sharp and harder to bear than that which is attended with the effort to expel; which never fails to inspire the patient with the hope of being freed from the misery which she endures. When the parts are to our apprehension in the same state, there will be a wonderful difference in the manner of, and the time required for, their dilatation, in first and subsequent

subsequent children. There might be much difficulty in exploring and ascertaining the cause of this difference: but we may presume that a part which is accustomed to perform an office, or undergo a change, acquires a disposition to the office or change, according to the number of times it has performed that office or undergone that change. Something of the kind may be observed in new-born infants, in which there is often a tardiness in executing what may be considered as the common functions of the body.

As a labour advances the intervals between the pains become shorter, and their force is increased. At the time of each pain the patient is restless, and solicitous for the event; but when it ceases, by a happy oblivion, she soon forgets it, and is unmindful of its return. In some constitutions the labour, instead of adding to the irritability of the habit, and exciting its powers to action, occasions a degree of insensibility; or the patient falls into a sound sleep the moment the pain begins to abate, from which she is awakened by its return. In others, the power exerted by the *uterus*, aided by that of the abdominal muscles and diaphragm, being insufficient for the purpose of dilating the *os uteri*, or that part becoming unusually irritable by the frequent impressions made

upon it; then, by its consent with the stomach, extreme sickness or vomiting is brought on, sometimes after every pain, by which the labour is very much forwarded; one fit of vomiting, according to popular observation, doing more service than several pains. But when the *os uteri* is dilated patients have very seldom an inclination to vomit from any natural cause. Vomiting very often attends the passage of a stone through the *ureters*, or the *gall-ducts*, from the same cause, and with the same effect.

By regular returns of pain, or with the varieties before mentioned, with many others which it is impossible to enumerate, the *os uteri* becomes at length wholly dilated. Whether a short or a long time be required for this purpose, it is the duty of the practitioner to abstain from interfering in this part of the process. It may sometimes be necessary to pretend to assist, with the intention of giving confidence to the patient, or composing her mind. But all artificial interposition contributes to retard the event so impatiently expected, by changing the nature of the irritation and the action thereon depending; by inflaming the parts, and rendering them less disposed to dilate; in short, by occasioning either present disorder or future disease. For these reasons

reasons we must be firm, and resolved to withstand the entreaties which the distress of the patient may urge her to make, as we must also the dictates of vehemence and ignorance. Others may be impatient, but we must possess ourselves, and act upon principle. The event will justify our conduct; and, though there may be temporary dislike and blame, if we do what is right there will be permanent favour and reputation.

During the continuance of a pain the membranes containing the waters are turgid, pressed upon, and within the circle of the *os uteri*, according to the strength of each pain, by which the further dilatation is promoted; but in the absence of a pain the membranes become flaccid, and seem to be empty. These different states of the membranes are readily explained by the observations before made, by our knowing that when the *uterus* is in action its cavity is lessened, and of course its contents are compressed; but on the cessation of the action the cavity of the *uterus* is again enlarged, and the compression removed. Hence it becomes necessary, when an examination *per vaginam* is made during the time of a pain, that we should be cautious not to break the membranes; and if any accurate investigation is needful, either of the state of the parts or of the

position of the child, that it ought to be made in the interval between the pains, or protracted till the pain has ceased.

In a short time after the *os uteri* is wholly dilated, the membranes are usually ruptured by the force of the pains, and the waters of the *ovum* are discharged in one large gush or stream. But in many cases the membranes break spontaneously long before this period, without any material inconvenience. In some they are not ruptured when the dilatation of the *os uteri* is completed, but are protruded by each successive pain lower down into the *vagina*, and then within the *os externum*, which they also dilate; and at length a small bag of water is formed without the *os externum*, which can serve no farther purpose.

It is a commonly received opinion among the lower class of people that the child should be born speedily after the rupture of the membranes and the discharge of the waters. This opinion is not founded in prejudice, but in sound observation; and was probably first entertained by those who were engaged in the care of breeding cattle, in which this is the usual course of parturition; and I believe it would often happen in the human species if the progress of the labour was not by some means or other disturbed or interrupted.

But it has been a custom, which at the present time is not unfrequent with practitioners, urged by the distress and suffering of those whom they are attending, or by the concern of friends, or by a persuasion of its propriety and advantage, and sometimes perhaps by their own impatience, to break the membranes before the *os uteri* is dilated. If these are ruptured spontaneously or artificially before the *os uteri* is dilated the child cannot possibly follow immediately; and all that is gained is by bringing the head of the child, instead of the membranes containing the waters, into contact with the *os uteri*. This cannot be considered as any advantage, as it changes a very soft and accommodating medium, provided by Nature for the purpose of preventing any undue violence upon a very tender part, for the hard and unaccommodating head of the child. Nor is this the only ill consequence which follows: by such proceeding we occasion a general derangement of the order of the labour, which is never done with impunity, as it may afterward become the cause of a laceration of the external parts, or even of an unfavourable separation of the *placenta*. Moreover, by this premature rupture of the membranes, we often defeat our own purpose; and, by disturbing, protract instead of hasten the labour.

labour. Let us therefore agree in establishing it as a general rule for our own conduct, that the membranes shall never be ruptured artificially, at least before the *os uteri* is fully dilated, and be persuaded that it is afterwards unnecessary, unless there should be some cause more important, or some reason of more weight than those which have been commonly assigned.

SECTION VII.

IN the second period or stage of a labour will be included all the circumstances attending the descent of the child; the dilatation of the external parts; and the final expulsion of the child.

Notwithstanding the definition of a natural labour, which was before given, this is not to be considered as a process going on in one unvarying line, and that every aberration is to be thought of sufficient importance to constitute a labour of another class. In this respect the definition of a labour may be compared to that of health, which, however correct in general, if submitted to a
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critical examination, would not correspond in all points with the state of any individual person. In like manner, though a labour cannot come under the denomination of *natural*, without the three distinguishing features, yet we may probably never meet with any two labours in every respect exactly similar. There are perhaps more frequent deviations in the first stage of a labour than in the rest, both with regard to the time and the manner in which the *os uteri* is dilated. Nor is the first stage concluded either by the dilatation of the *os uteri*, or by the rupture of the membranes and the discharge of the waters, but by the concurrence of these circumstances; and the farther the labour is advanced before the membranes break, the better it afterwards terminates. For, before that event, there is less violence done to the mother, and less stress upon the parts; because, without much suffering, they every moment acquire a better disposition to dilate; and, till that has happened, whatever may be its position, the child undergoing no compression is free from all chance of injury.

When the membranes break, if the *os uteri* be fully dilated, the child, though resting at the superior aperture of the *pelvis*, either sinks by its own gravity, if the patient be in an erect position,
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or is propelled by a continuance of the same pain by which they were broken; or, after a short respite, the action of the *uterus* returns, and the head of the child is brought so low as to press upon the external parts; properly speaking, upon the internal surface of the *perinæum*. In its passage through the *pelvis*, the head of the child, which at the superior aperture was placed with one ear to the *pubis* and the other to the *sacrum*, or with different degrees of diagonal direction, undergoes various changes of position, by which it is adapted to the form of each part of the *pelvis*, with more or less readiness, according to its size, the degree of its ossification, and the force of the pains. With all these changes, whether produced easily or tediously, in one or in many hours, the practitioner should on no account interfere, provided the labour be *natural*. If he attempts to correct and to regulate every slight deviation, or uses any artificial means for hastening the process, the events of his practice will convince him that he has exercised his art on unnecessary and improper occasions. He will moreover be taught, though he may acquire momentary approbation by endeavouring to remove every little present inconvenience, that diseases then far distant will be attributed to his misconduct,

conduct, and sometimes not without reason. In this state and kind of labour he may with confidence rely upon the powers and resources of the constitution, which will produce their effect with less injury either to the mother or child, and with more propriety than can be done by the most dexterous human skill.

When the head of the child begins to press upon the external parts, these yield in a shorter or longer time, and with more or less ease, according to their natural rigidity, the degree of disposition to dilate which they have assumed during the labour, and the number of children which the patient has before had. The prevention of any injury to the mother when the child is passing through the external parts being esteemed a circumstance wholly depending upon the care of the practitioner, this part of our subject deserves a separate and particular inquiry.

SECTION VIII.

WHEN the head of the child first begins to press upon and dilate the external parts, every pain may be suffered to produce its full and natural effect, without the hazard of mischief. But when a part of the head is insinuated between them, and the *perinæum* is upon the stretch, they are liable to be injured by the violence of the distention. Any of these parts may be injured; but the *perinæum* in particular is subject to a laceration, which may not only extend so far as to occasion much present uneasiness, but very deplorable consequences for the remainder of the patient's life. It is therefore our duty to inquire into the merits of the different methods which have been recommended for the prevention of this accident, more especially as it admits of very imperfect relief when it has happened.

Yet it is very remarkable that none of the ancient writers * either advise any method by which this accident may be prevented, or any

* In the works of *Eros*, who lived in the 13th century, and which were published by *Spachius*, this accident is mentioned, and an awkward method of preventing it is recommended.

means to be used for its relief, excepting such as were generally recommended for inflamed, ulcerated, or fistulous parts. We may therefore presume that it is an accident which did not frequently occur in their practice, or that it was esteemed of too little consequence to engage their attention. With respect to the former opinion, it may be observed, that whatever event is the consequence of any cause must at all times be produced under the same circumstances, if that cause continues to exist and to act. But those who had not perfection in view, and formed no very nice rule for their own conduct, might not be sensible of deviations, and would not adjudge disagreeable consequences to their own error or mismanagement. They did not therefore advise any method of preventing this accident, because they were ignorant of the cause, or they undervalued it.

It may be further observed, that the oldest writers in midwifery lived before the Christian religion was established, and in countries in which polygamy was allowed; when the death or infirmity of one wife was comparatively of little importance to him who had many, equally, or in some degree, dividing or partaking of his affection. But on the establishment of the Christian religion,

religion, by which the selfish and bad dispositions of the human mind were restrained or corrected, and its better qualities exalted, one wife only being allowed to one man, and she being supposed to possess the entire affections of her husband, every disease or infirmity, which might render her person less agreeable to him, became of infinite consequence to their mutual happiness. Those only who in the present state of society have had an opportunity of seeing the many evils which flow from this alienation of affection, the cause being perhaps unknown to the parties themselves, can be sufficiently aware of the importance of this and many other accidents to which women are subject; and which are often neglected and disregarded, because they are not attended with immediate danger.

Still the question remains to be decided, whether women are by any peculiarity of construction naturally or necessarily subject to a laceration of the *perinæum*; or whether this accident be the consequence of opinions entertained, and of alterations in the frame, occasioned by the peculiar manners of society; or of any adventitious circumstance whatever, at the time of delivery. It was before observed *, that none of the classes

* See Chap. II. Sect. VI.

of animals are liable to a laceration of the *perinæum*, except when extraordinary assistance is given in cases of otherwise insuperable difficulty; and it is well known that the laceration does not universally happen to those women who are delivered before proper assistance can be given. It is also to be remarked that, as far as relates to the state of all the internal parts, the changes which they undergo at the time of parturition are not only effectually, but most safely produced by the instinctive efforts of the parent. From a general survey of the wisdom, order, and benignity, so clearly apparent in all the designs of Providence, in every circumstance particularly which relates to the propagation of the different species of animals, and the co-aptation, as it were, of that wisdom to the necessities of those of every kind, we might perhaps be justified in making this general conclusion, that women, in every circumstance which relates to their safety and well-doing in natural parturition, are not left in a more destitute state than animals. For though it were proved that women are liable to greater natural evils and difficulties in parturition than animals, the proofs of these would equally satisfy our minds that they are also provided by nature with many peculiar resources, and

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with powers which are limited only by the degree of the difficulties which require their exertion.

Nevertheless, from the frequency of the laceration of the *perinæum*, when women are delivered without assistance, and from the difficulty with which it is sometimes prevented when the most judicious and skilful assistance is given, it is believed by many that women must often be unavoidably subject to it, and that the prevention must ever remain an object of human skill. Now, with respect to the first statement, that of the laceration happening when women are delivered without assistance, it does not follow that it is inevitable; for even then it may be the production of error in the patient herself, or her friends. Because, from the hurry and solicitude of their minds, and even by their fears, she may have been encouraged to make great voluntary efforts, when the head of the child was on the point of coming into the world, merely because she was not assisted; or, after the expulsion of the head, instead of waiting for the body to be expelled also, some officious person presumed to extract it without regard to time, or the direction of the *vagina*. As to the difficulty or impossibility of preventing the laceration in
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some cases, we are to consider that what may happen in a state of society might not have happened in a state of nature; that the foundation of the accident may have been laid by something done in the preceding stage of the labour; and that it may be very much doubted, whether some of the methods practised for the prevention may not in fact have been the cause of the accident.

But the conduct of the practitioner is not to be guided by reflections on what his patients might do or bear, with constitutions healthy and firm, and with minds untainted with prejudices; but by due consideration of what they are *now* capable of doing or bearing; and he must adapt his rules and his practice to the state in which he actually finds them. From some natural or acquired cause the laceration of the *perinæum* certainly does very often happen; and as so much of the future happiness of a woman may depend upon its prevention we will grant, what is in many cases true, that it is always to be prevented by our skill and care; as no harm can arise from the opinion, though erroneous, if the assistance we afford be judiciously given.

In the beginning of a labour, especially with first children, it is not unusual to find the ex-

ternal parts closely contracted, and void of all disposition to dilate : yet in the course of a few hours, even when they have undergone no kind of pressure, but merely by a disposition assumed from their consent with the internal parts, they become relaxed and soft. The longer the time therefore which passes between the commencement of labour and the birth of the child, the less liable to a laceration will the *perinæum* be ; for it is never lacerated in a very slow labour, whatever may be the size of the child. But if it was possible to hurry a labour in such a manner that the head of the child should be brought into contact with, and pressed forcibly upon, the external parts, before they had acquired the disposition to dilate, they would be universally torn, unless the accident was prevented by art ; and the chance of the accident would be according to the degree of precipitation, and perhaps many hours after the act, by which the labour was hurried, was forgotten.

When the head of the child is insinuated within the external parts, if these do not easily yield to the occasion, it has been customary to dilate them artificially, under the idea of preparing them, to allow of the more speedy passage of the head. During every pain, it is obvious that
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the parts undergo as much distention as they are capable of bearing without injury ; and this preparation irritating and causing an additional stress upon them, nothing is more clear than that this method of proceeding contributes to their laceration. All artificial dilatation of the parts, all attempts to slide the *perinæum* over the head of the child speedily, are therefore to be forborne, and avoided as pernicious.

When the external parts are very rigid we have been taught that it is of great service to anoint them frequently and unsparingly with some unctuous application, with the intention of giving or improving that disposition to dilate which is wanting. If the parts are clothed with their proper *mucus*, as by the use of any application in the manner advised, that would be absterged, we shall afterwards find ointments of any kind a very poor substitute for that *mucus*, and that there is little profit from their use. But if the parts are heated and dry, after the application of flannels wrung out of warm water some soft and simple ointment may be serviceable, by abating their heat, giving them a disposition to secrete their proper *mucus*, and of course favouring their dilatation.

In some constitutions the different parts concerned are not equally inclined to dilate. Sometimes the internal parts dilate in the most kindly manner, when the external are in a contrary state; and sometimes the internal are very rigid, when the external parts have the greatest aptitude to dilate, yielding to the first impulse of the head. There is in all infinitely more difficulty with first than with subsequent children, not from rigidity only, but, if we may be allowed the expression, from ignorance how to dilate; and from a certain degree of re-action in the parts during the continuance of every pain. It is therefore often observed that the head of the child advances more, and with greater safety, when the violence of a pain begins to abate, than during its continuance in full force; because the re-action of the parts is then the strongest.

During a pain there is often reason to expect that the head of the child would be excluded; but the moment the pain declines the head is retracted a considerable way into the *vagina*, and the external parts close again. No other inconvenience arises from this cause than a little prolongation of the labour, which may be irksome, but cannot be injurious. If the parts do not distend favourably, should the head of the child
abide

abide within them in the absence of a pain, it may be expedient to repel it in imitation of this natural occurrence, for the purpose of preventing the laceration.

When the head of the child is every moment expected to pass through the external parts we have been advised by some to forward the emergence of the head from under the arch of the *pubes*. Others have on the contrary assured us that it is more eligible to prevent, for a certain time, this emergence, by which means not only time is given for the parts to dilate, but the head of the child is brought to pass through them in its smallest *axis*, and less distention is thereby occasioned. Whoever has reflected upon this subject would hesitate as much to believe that, in the general dispensation of Providence, it should have been left to human skill to guide the head of the child at the time of birth in a direction different from that in which it most commonly presents, as that it could have been intended for the generality of children to have been brought into the world by instruments, or by any human invention. As far as my experience enables me to judge, neither of these methods ought to be followed, nor any other which requires a complication of artifice; for, after a

trial of them all, I am convinced that the most effectual method of preventing a laceration, or any injury to the parts, is to be founded on the single principle of retarding, for a certain time, the passage of the head of the child through them. This retarding may depend on the composure of the patient, and the skill of the practitioner; and those errors, of which the former might be guilty, the latter must endeavour to obviate and correct,

When the head of the child is nearly born the effort to expel is made instinctively, and it is usually vehement, the breath being retained for the purpose of strengthening that effort. The patient may also, from a persuasion of its being necessary and proper, or at the instance of her friends, strive with much voluntary exertion to add to the force of the pain, for the purpose of expelling the child more speedily. If we presume that the danger of injuring the parts depends merely upon the rapidity with which the head may be expelled, and that these are only able to bear without injury so much distention as is occasioned by the instinctive efforts, then all the additional voluntary force is beyond what is either needful or safe. * It is therefore requi-

* See Chap. II. Sec. VI.

sitate that we should do away this voluntary force by convincing the patient of its impropriety, and dissuading her from exerting herself, or lessen at least the voluntary effort, by urging her to talk or cry out during the time of a pain, which will prevent her from retaining her breath; or, if her sufferings are so great that she cannot command her own actions, then the efforts she makes must be resisted on our part by the application of some equivalent force, in the manner we shall soon consider. When the patient has been outrageous, and the danger of a laceration very great, I have sometimes gained a respite by telling her suddenly, in the height of a pain, that the child was already born.

Every thinking man will carry the principles he has considered and approved, in his remembrance, through the whole course of his practice; but the methods by which his principles are pursued must be carefully suited to the particular exigences of every individual case. In the subject of which we are now speaking there is a number of little circumstances, the knowledge of which can only be learned by reflection and experience. But it will generally be sufficient for the practitioner to resist the progress of the head of the child, during the time of a pain,
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by placing upon it the fingers and thumb of the right-hand, so formed that they may bear upon many points; or, to apply the palms of one or both of the thumbs in such a manner, that they shall at the same time support the *fourchette*, or thin edge of the *perinæum*. But in first children, when, from the vehemence of the patient, and the rigid state of the parts, there is great reason to apprehend a laceration of the *perinæum*, then, occasionally calling in the other means to our aid, we shall be able to give the most powerful and effectual support, by applying the palm of the left-hand, covered with a soft cloth, over the whole * temporary and natural *perinæum*, and the right-hand employed as was beforementioned, with a force sufficiently firm to resist the exertions of the patient during the violence of the pain. In this way we are to proceed till the parts are sufficiently dilated, when the head may be permitted to slide through them in the slowest and gentlest manner; and we are never to quit our attention till it is perfectly cleared of the *perinæum*. Should there be any delay or awkwardness when the *perinæum* slides over the face, the fore-finger of the right-hand must be passed under its lateral edge, by which it may

* See Chap. II, Sec. VI,

be cleared of the chin before the support given by the left-hand is withdrawn. When the pains are exceedingly strong, and the patient restless in her efforts, the head will sometimes be expelled with wonderful velocity, in opposition to all the resistance we are able to make; but by this calm and steady proceeding we may be assured that we shall, under all circumstances, wholly prevent, or greatly lessen, all the evils to which she would have been liable if our conduct had been different.

It is necessary to observe that these attempts to prevent the laceration of the *perinæum* produce some effect upon the head of the child, and upon the parts of the mother. In the application, therefore, of the resisting force we must not only be careful that the position of the patient is proper, and such as will allow us to act with advantage, but that we do not make any injurious or partial pressure; because, if a partial support be given to the *perinæum*, the head of the child is projected against an unsupported part, and the danger of a laceration is increased. The support must be equally applied and uniformly exerted; and then there will be no more prejudice than what might be occasioned by the rigidity of the parts,

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When the head of the child is expelled, perhaps the consequences of an instant transition from extreme misery to total freedom from pain, and to positive joy, are in no case, to which human nature is subject, more conspicuous and interesting, though the delivery be not completed. It was formerly supposed necessary for the practitioner to extract the body of the child immediately after the expulsion of the head, lest it should be destroyed by confinement in this untoward position. But experience has not only proved that the child is not on that account in any particular danger; but that it is really safer and better, both for the mother and child, to wait for the return of the pains, by which it will soon be expelled; and a more favourable exclusion of the *placenta* will also by that means be obtained. In the course of a few minutes after the expulsion of the head, the action of the *uterus* returning, the shoulders of the child advance, and the external parts of the mother being again brought upon the stretch, the practitioner must place the fingers of his right-hand on each side of the neck, and at the same time with the left support the *perinæum* with as much circumspection as when the head was expelled; he must then conduct the body slowly in the direction of the *vagina*, till it is wholly extricated.

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The child is to be placed in such a situation that the external air may have free access to its mouth, its head being covered; care being then taken of the mother we must proceed to tie the navel-string in the manner recommended in the next section.

SECTION IX.

THE operation of tying and cutting the navel-string when the child is born, though in itself of no great importance, was formerly thought to require so much skill and judgment as to give a professional name to those who are now called practitioners in midwifery. But every thing which relates to the treatment of the mother or child is of some consequence; and, even in trifling matters, there is a propriety of manner, the want of which may lessen the estimation of every person's character.

It seems to have been a practice with the ancients to wait for a certain time after the birth of the child for the exclusion of the *placenta* before

fore the navel-string was tied or divided; if the child was born apparently dead, or in a very feeble state, the *placenta*, when expelled, was laid upon its belly, as a restoring or comforting application. When the child revived but slowly, or when the signs of life declined, it became a custom to lay the *placenta* on hot embers, * or to immerse it in hot wine; and the heat thereby conveyed was supposed to stimulate the weak or decaying powers of life to more vigorous action. It has since been the practice to divide the *funis* immediately after the birth of the child; and the weaker this was, the more expedition it was thought necessary to use; for, the child being supposed to be in a state similar to that of an apoplectic patient, a certain portion of blood might by that means be discharged from the divided *funis*, and the imminent danger instantly removed. There is another method which I have seen practised, the very reverse of the former; for in this, the loss of any quantity of blood being considered as injurious, the navel-string was not divided, but the blood contained in its vessels was repeatedly stroked from the *placenta* towards the body of the child. In all these different methods, and many others found-

* See *Peu Pratique des Accouchments*, Livre I. Chap. xii. 18.
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ed on directly contrary principles, children have been treated in different times and countries, and yet they have generally done well; the operations of Nature being very stubborn, and happily admitting of considerable deviation and interruption, without the prevention of her ends.

There is yet in all things a perfectly right and a wrong method; and, though the advantage or disadvantage of these may be overlooked, the propriety and advantage of the right method must be evidently proved by individual cases, and of course by the general result of practice. In this, as well as in many other points, we have been too fond of interfering with art, and have consigned too little to nature; as if the human race had been destined to wretchedness and disaster, from the moment of birth, beyond the allotment of other creatures.

Perhaps the changes which take place in the body of the child, immediately after its birth, at least the manner in which they are produced, are not perfectly understood at this time. * But we know if the child is in a healthy state that it

* See *Peu Pratique des Accouchments*, Livre I. Chap. xii. 18.

And an Essay on the Treatment of Women in Childbed; written by my very ingenious and indefatigable friend Mr. Charles White.

cries lustily and continually, when the air rushes into its lungs, which are thereby expanded. This cry, which does not seem to be occasioned by pain but surprise, is in its consequences extremely important, as it is the cause of an exertion of all the powers of the child, and enables it to acquire a new manner of living, inconsistent with, and very different from, that which it possessed before it was born. But the change from uterine life, as it may be called, to breathing life, is not instantaneous, but gradual; and the uterine life continues till the breathing life is perfected, as is proved by the continuance of the circulation between the child and *placenta* for some time after it has cried. As the breathing life becomes perfected, the uterine life declines: and the manner of its declension may be proved by attending to the pulsation of the navel-string, which first ceases at the part nearest the *placenta*; and then, by slow degrees, nearer and nearer to the child, till at length it entirely ceases; so that the whole of the circulating blood ultimately resides in the body of the child, and the navel-string becomes quite flaccid. It seems reasonable to believe that the continuance of the uterine life after the birth of the child was designed for its preservation from the accidents

dents of its state at that time ; should the acquisition of its breathing life be by any cause retarded or hindered. If then the practice of tying or dividing the navel-string the instant the child is born be followed, though it were before vigorous, it will in some cases immediately decline; and, never acquiring its perfect breathing life, may in a short time die: or, if the child were in a feeble or a dubious state, possessing only that life which it had during its residence in the *uterus*, as by tying and dividing the navel-string that life is destroyed before the breathing life is acquired, it must inevitably perish. We may therefore safely conclude that the navel-string of a new-born infant ought never to be tied or divided till the circulation in it has ceased spontaneously ; nor would the child suffer, though the *funis* was never tied, if it was not divided.

With respect to the manner of tying the navel-string there has also been much difference of opinion, whether there should be one or two ligatures, and in what part these should be fixed. Two ligatures were advised on the presumption that, by the end of the *funis* next the *placenta*, the maternal blood might be discharged, and the parent brought into great danger, as if there were two currents of blood circulating in the

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vessels;

vessels; and by some it was also supposed proper to use two ligatures, for the purpose of retaining the blood, presuming that the *placenta* would be cast off more commodiously, in the manner of a gorged leach. On the contrary, one ligature has been recommended, that we might have an opportunity of draining away as much blood as possible from the *placenta*, by the divided end of the *funis*, which was supposed to produce an advantage equal to the diminution of the bulk of the *placenta*. But, if the custom of deferring to make the ligatures till the circulation in the *funis* ceases be established, all this reasoning in favour of one or two ligatures will fall to the ground. Yet, as there is a possibility in the case of twins, with a double *placenta*, of the child yet unborn losing its blood by the divided *funis* of that which is born, and from the habit of using them, on the whole, I prefer two ligatures, more especially as no harm can arise from them, even if one should be useless. As to the part where the ligature ought to be fixed it is of no real consequence; because the future separation of the *funis* will not be made at the ligature, wherever that is fixed, but at a line, evidently marked, and close to the belly of the child; and as to the materials used, provided they are not

so thick as to be cumbersome, nor so thin as to cut the *funis*, it is all that is required.

In the course of ten or twenty minutes, and sometimes longer, after the birth of the child, the circulation in the *funis* having ceased, one ligature is to be fixed upon it about three inches from the belly of the child, and another at twice that distance, with so much force as to repress the circulation which may happen to return, and yet not so firmly as to divide it. The navel-string may then be cut with a pair of scissors between the two ligatures, and the child given to a careful assistant. It was formerly the custom to divide the *funis* under the bed-clothes; but, having once known a very deplorable accident happen from this cause, I make it a general rule to withdraw the child, that I may have an opportunity of seeing when I tie or divide the *funis*.

SECTION X.

Soon after the birth of the child it is proper to apply the hand upon the *abdomen* of the mother, to ascertain whether there be another child; or whether the *uterus* be contracting in a manner

favourable to the separation and exclusion of the *placenta*. Both the doctrines and customs of practice, regarding the management of the *placenta*, have been exceedingly different, even in common cases ; and though one method of proceeding may be more generally preferred and followed than the rest, there is much diversity in the conduct of individual practitioners, who may be suspected to act sometimes in a manner contrary to their own judgment, in compliance with the prejudices of those by whom they are employed. The minds of all women are full of solicitous fears till the *placenta* is brought away ; and the sooner this is done, after the child is born, the more they are gratified. But though the discovery of truth, and the fidelity of practice founded thereon, may not always be acceptable ; yet in all practitioners, however desirous of obliging, there must be some firmness of mind, some determination to act upon principle, or they will be perpetually involved in error, and led to do what may be productive of immediate or distant mischief, in order to avoid the evil of present censure.

In the history which has been given of the former stages of a natural labour it appears, that all the passive changes which the parts undergo,
and

and all the active powers exerted for producing these changes, are not only entirely independent of the will of the patient, but are fully equal to the end which they were designed to accomplish without any assistance, which is no more wanted for the purpose of forwarding a natural labour than for any of the ordinary functions of the body. When we have seen a child safely expelled by a process beautiful, and regulated by the greatest wisdom, there seems to be no reason why we should be apprehensive of error or inability in those powers, for the separation or exclusion of the *placenta*, which is but an inferior and secondary part of the same process; or why we should not in this, as in all other cases of medicine, be first convinced of the necessity of using art before we attempt to give assistance. On the proper management of the *placenta* the life of the patient may depend; and it is therefore fitting and necessary that our conduct should be guided not by prejudice, but by the dictates of reason and experience.

After a natural labour, especially with a first child, the pain which the patient has suffered, and the exertions by which the expulsion of the child was effected, will have occasioned a proportionate

portionate degree of temporary fever, and she will be in the same situation as if she had undergone some excessive fatigue. By the birth of the child she is freed from her suffering, and it must be our first employment to restore tranquillity to her mind, to calm the hurried circulation of the blood, and to bring her as soon as we can into a quiet and natural state. In the course of ten, and seldom of more than twenty minutes, the action of the *uterus* is again excited for the purpose of expelling the *placenta*, which is indicated by pain, less in degree, but in other respects like that of which she complained when the child was expelled. It seldom happens that the *placenta* is either wholly separated or expelled by the first pain; but when that has ceased for a few minutes it is again renewed; and, on examination, the *placenta* is often found descended, or descending, into the *vagina*; where it may with safety and propriety be suffered to abide till it is wholly expelled by a repetition of the pains. But if the *placenta* should descend very slowly, or the patient be much disturbed, the practitioner may take hold of the *funis**, and
by

* When the young has been a short time expelled, carnivorous animals lay hold of the navel-string with their teeth, in order

by gently pulling in the time of a pain, and in a proper direction, favour its separation and descent. But whether the *placenta* should descend into the *vagina* spontaneously, or be brought down by the assistance given, it should be suffered to remain there till it is excluded by the pains; at least it should not be extracted before the hurry occasioned by the labour is wholly composed, and the *uterus* has had sufficient time to contract in such a manner as to prevent any alarming hemorrhage. The *placenta* seldom remains more than one hour in this situation; but, if it should not be excluded at the end of that time, we may again take hold of the *funis*, and, aiding the force of a pain, in the gentlest and slowest manner, bring the *placenta* through the *os externum*. We must be likewise cautious to bring down the membranes as perfectly as we can, that any *coagula* formed in the cavity of the *uterus* may be enveloped in them, and one principle cause of after-pain be removed. Then the patient, being put in a comfortable state, and as little disturbed as possible, may be left to her repose.

order to extract the *placenta*. It is probable that a woman in a state of nature would, with her own hands, give something like the same assistance; and in the force I use to bring down the *placenta*, I always bear in mind this circumstance.

In

In this third stage of a labour many inconveniences and many impediments to the exclusion of the *placenta* may occur ; some of which may require a longer time to be given, and others the assistance of art, for the removal or prevention of danger. But of all these difficulties, and the means of giving relief, we shall speak very fully when we come to the treatment of *Uterine Hemorrhages*.

END OF THE FIRST VOLUME.

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