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OBSTETRICS, the science and art of midwifery (Lat. *obstetrix*, a midwife, from *obstare*, to stand before). Along with Medicine and Surgery, Obstetrics goes to form what has been called the Tripos of the medical profession, because every person desiring to be registered under the Medical Acts must pass a qualifying examination alike in medicine, surgery and midwifery. The term Gynaecology (*q.v.*), which has come to be applied to the study of the diseases of the female generative system, in its primary sense includes all that pertains to women both in health and disease. Obstetrics, or midwifery, is more specially that part of the science of gynaecology which deals with the care of a pregnant woman and the ushering of her child into the world.

Tokology—the doctrine of parturition—is the most distinctive sphere of interest for obstetricians, and here their activities bring them into a closer approximation to the work of surgeons. As a science it demands a study of the phenomena of labour, which in their ordered succession are seen to present three distinct stages: one of preparation, during which the uterus dilates sufficiently to allow of the escape of the infant; a second, of progress, during which the infant is expelled; and a third, of the extrusion of the after-birth or placenta. In each of the stages analysis of the phenomena reveals the presence of three elements which are known as the factors of labour, viz. the powers or forces which are engaged in the emptying of the uterus; the

passages or canals through which the ovum is driven; and the passenger or body that is being extruded. The mechanism of labour depends on the balance of these factors as they become adjusted to each other in the varying phenomena of the several stages. The diversities that are met with in different labours even of the same woman have led to their being classified into different groups. A natural labour is commonly defined as one where the child presents by the head and the labour is terminated within twenty-four hours. From this it is obvious that no case of labour can be defined at its onset. The relation of the factors may warrant a favourable expectation; but until the labour is completed, and completed within a reasonably safe period, it cannot be classed as natural. The element of time has this importance, that it is found that, apart from all accidents and interferences, the mortality both to mother and child becomes greater the longer the duration of the labour. Hence lingering or tedious labours, in which the child still presents with the head, but is not expelled within twenty-four hours after the onset of labour-pains, are properly grouped in a separate class, although they are terminated without operative interference. In the class of preternatural labours, where the head comes last instead of first, there are two subdivisions, according as the child presents by the breech and feet, or lies transversely as a cross-birth, and has usually to be delivered artificially. Operative or instrumental labours vary according as the procedures adopted are safe in principle to mother and child, such as turning and the application of the midwifery forceps; or as

they involve damage to the infant in the various forms of embryotomy; or are more dangerous to the mother, as in the Caesarean section and symphysiotomy. A final class of labours includes the cases where some complication or anomaly arises and becomes a source of danger, independently of disturbances of the mechanism or of any operative interference. These complex labours are due to complications that may be maternal, such as haemorrhage and convulsions; or foetal, such as twins or prolapse of the umbilical cord. To cope with these anomalies an obstetrician requires all the resource of a physician and all the dexterity of a surgeon.

The interest of obstetricians in their patients does not end with the birth of the children, even after natural labours. The puerpera is still a subject of care. The uterus, that during its nine months' evolution had been increasing enormously in all its elements, has in six weeks to undergo an involution that will restore it to its pregravid condition. The allied organs share in their measure in the change, all the systems of the body feel the influence, and especially the mammary glands take on their function of providing milk for the nutriment of the new-born infant. A patient with some latent flaw in her constitution may pass the test of pregnancy and labour with success, only to succumb during the puerperium. Of patients who become insane in connexion with child-bearing, a half manifest their mental disorder first during the days or weeks immediately succeeding their confinement, and numbers more whilst

they are suckling their infants. A woman may have had an easy labour, and may have been thankful at the time for help from a hand that she did not know to be unclean; three days later germs left by that hand may have so multiplied within her that she is in mortal danger from septicaemia. The management of the puerperal patient requires not only the warding off of deleterious influences, but the watching of the normal processes, because slight deviations in these, undetected and uncorrected now, may become later a source of lifelong invalidism. It remains further to be noted that to obstetricians belong the earliest stages of pediatrics in their care of the new-born child. In some old works practitioners of this branch of the profession are described as ὀμφαλστόμοι, because their first business was to cut the umbilical cord. The causes of the high death-rate among infants, whether due to ante-natal, intra-natal or neo-natal conditions, come under their observation. They have charge of the whole wide field of the hygiene, pathology and therapeutics of infancy.

Historical Sketch.—The origin of midwifery is lost in the mists of human origins. The learned Jean Astruc, who gave a lead to higher critics in their analysis of the Pentateuch by pointing out the presence of Elohistic and Jehovistic elements, exercised his imagination in fancying how the earliest pair comported themselves at the birth of their first child, and especially how the husband would have to learn what to do with the placenta and umbilical cord. His speculations are not in the least illuminative. The Mosaic

writings let us see women of some experience and authority by the side of a Rachel dying in labour, or a Tamar giving birth to twins, and superintending the easy labours of Hebrew slaves in Egypt. The Ebers Papyrus (1550 B.C.), which Moses may have studied when he grew learned in all the wisdom of the Egyptians, is the oldest known medical production. It contains prescriptions for causing abortion, for promoting labour, for curing displacements of the uterus, &c. But there is no indication as to how labours are to be managed, and with regard to the child there are only auguries given as to whether it will live or die, according, *e.g.* as its first cry after it is born sounds like *nī* or *bá*.

The story of the rise and progress of midwifery is intimately bound up with the history of medicine in general. The obstetrician, looking for the dawn of his science, turns like his fellow-workers in other medical disciplines to the Hippocratic writings (400 B.C.). Now the father of medicine was not an obstetrician. As with Egyptians and Hebrews, the skilled attendants on women in labour among the Greeks were also women. But since nothing that concerned the ailments of humanity was foreign to Hippocrates, there are indications in the writings that are accounted genuine of his interest in the disorders of females—in their menstrual troubles, in their sterility, in their gestation symptoms, and in their puerperal diseases; his oath forswears the use of abortifacients, and he recommends the use of sternutatories to hasten the expulsion of the after-birth. In the Hippocratic writings that

are supposed to be products of his followers some of these subjects are more fully dealt with; but whilst the physician is sometimes called in to give advice in difficult labours, so that he can describe different kinds of presentation and can speak of the possibility of changing an unfavourable into a favourable lie of the infant, it is usually only with cases where the child is already dead that he has to deal, and then he tells how he has to mutilate and extract it. So these writings furnish us with the earliest account of the accoucheur's armamentarium, and let us see him possessed of a μαχαίριον—a knife or perforator for opening the head; a πίεστρον—a comminutor for breaking up the bones; and a ἑλκυστήρ—an extractor for hooking out the infant. The classical writers of Greece give the same impression as to the primitive stage of obstetrics. Women, like the mother of Socrates, have the charge of parturient women. Where divine aid is sought, goddesses are invoked to facilitate the labour. Gods or men are only called in where graver interference is required, as when Apollo rescued the infant Aesculapius by a Caesarean section performed on the dying Semele. Some midwives are known to history, and extracts from the writings of one Aspasia are embedded in the works of later authors. In the great medical school of Alexandria, when the science of human anatomy began to take shape, Herophilus rendered a service to obstetrics in giving a truer idea of the anatomy of the female than had previously prevailed; other physicians give evidence of their interest in midwifery and the diseases of women, and some experience was gradually being acquired and

transmitted through the profession until we find from Celsus (in the reign of Augustus) that when surgeons were called in to help the attendant woman they could sometimes bring about the delivery, without destroying the infant, by the operation of turning. In the 2nd century Soranus wrote a work on midwifery for the guidance of midwives, in which for the first time the uterus is differentiated from the vagina and instruction is given for the use of a speculum. A contemporary, Moschion, wrote a guide for midwives which, with that of Soranus, may be said to touch the high-water mark of archaic midwifery. It is written in the form of question and answer, was much prized at the time of the Renaissance, and was used as the basis of the first obstetric work that issued from a printing-press. Philumenos wrote a treatise of some value at the same epoch, but it is only known from the free use made of it by subsequent writers, such as Aëtius in the beginning of the 6th century. Like Oribasius, who preserved in his compilation the work of Soranus, Aëtius draws largely on preceding writers. His treatises on female diseases constitute an advance on previous knowledge, but there is no progress in midwifery, though he still makes mention of turning. This operation has disappeared from the pages of Paulus Aegineta, an 8th-century author, the last to treat at length of obstetrics and gynaecology ere the night of the dark ages settled down on the Roman world, and it is not heard of again till a millennium had passed. During the centuries when the progress of medicine was dependent on the work of the Arabian physicians, the science of obstetrics stood still. We

are curious to know what Rhazes and Avicenna in the 9th and 10th centuries have to say on this subject. But they know little but what they have learned from the Greek writers, and they show a great tendency to relapse to the rudest procedures and to have recourse to operative interferences destructive to the child. Interest attaches to the work of Albucasis in the 12th century, in that he is the first to illustrate his pages with figures of the knives, crushers and extractors that were employed in their gruesome practices, and that he gives the first history of a case of extrauterine pregnancy.

We come down to the 16th century before we begin to see any indication of the development of obstetrics towards a place among the sciences. Medicine and surgery profited earlier by the intellectual awakenings of the Renaissance and the Reformation. In anatomical theatres and hospital wards associated with universities great anatomists and clinicians began to discard the dogmas of Galen, and to teach their pupils to study the body and its diseases with unprejudiced minds. But the practice of midwifery was still among all people in the hands of women, and when in 1513 Eucharius Roesslin of Frankfort published a work on midwifery, it bore the title *Der schwangeren Frawen und hebammen Rosengarten*. Translated into English by Thomas Raynald with the altered title, *The Birth of Mankynd*, it is mainly compiled from Moschion, and the Soranus and Philumenos fragments of Oribasius and Aëtius, and is intended as a guide to pregnant women and

their attendant nurses. It was illustrated with fanciful figures of the foetus *in utero* that were reproduced in other works of later date—as in the *Rosengarten* of Walter Reiff of Strassburg in 1546 and the *Hebammenbuch* of Jacob Rueff of Zurich in 1554, the latter of which appears in English dress as *The Expert Midwife*. The greatest impulse to the progress of midwifery was given in the middle of the 16th century by the famous French surgeon Ambroise Paré, who revived the operation of podalic version, and showed how by means of it surgeons could often rescue the infant even in cases of head presentation, instead of breaking it up and extracting it piecemeal. He was ably seconded by his pupil Guillemeau, who translated his work into Latin, and at a later period himself wrote a treatise on midwifery, an English translation of which was published in 1612 with the title *Child-Birth*; *or, The Happy Deliverie of Women*. The close of the 16th century is rendered further memorable in the annals of midwifery by the publication of a series of works specially devoted to it. Three sets of compilations, containing extracts from the various writers on obstetrics and gynaecology from the time of Hippocrates onwards, were published under the designation of *Gynaecia* or *Gynaeciorum*—the first edited by Caspar Wolff of Zurich in 1566, the second by Caspar Bauhin of Basel in 1586, and the third by Israel Spach of Strassburg in 1597. Spach includes in his collection not only Paré's obstetrical chapters, but the Latin translation of the important *Traitte nouveaux de l'hysterotomotokie*, published by the French surgeon Francis Rousset in 1581, which is the first distinct

treatise on an obstetric operation, and advocates the performance of Caesarean section on living women with difficult labours. From this time onwards evidence accumulates of the growing interest of members of the medical profession, and more especially of surgeons, in the practice of midwifery, and after the middle of the 17th century they began to publish the records of their experiences in special treatises. The most important of these writers were French—as Mauriceau, Viardel, Paul Portal, Peu and Dionis. The work of Mauriceau, which first appeared in 1668, is specially interesting from its having been translated into English in 1672 by Hugh Chamberlen, who in his preface made the then incredible statement that his father, his brothers, and himself had long attained to and practised a way to deliver women in difficult labours without hooks, where other artists used them, and without prejudice to mother or child. Many years had still to elapse before the secret of the Chamberlens leaked out. In the course of this century some women who had large experience in midwifery appeared as authors. Thus in England Jane Sharp in 1671 wrote *The Midwives' Book, or the whole art of Midwifery discovered*; in Germany, Justine Siegemund, in 1690, *Die Chur-Brandenburgische Hoff-Wehrmutter*; and earlier and better than either, in France, Louise Bourgeois in 1626 published *Observations sur la stérilité et maladies des femmes*. Perhaps they were beginning to feel that there was some need to assert their power, for it was during this century that parturient ladies began to call in men to attend them in natural labours.

According to Astruc, Madame de la Vallière wished her confinement to be kept secret, and Louis XIV., in June 1663, sent for Jules Clement, the court surgeon, to superintend the delivery. This was accomplished successfully. The king gave him the title of accoucheur. Clement afterwards attended the dauphiness and other court ladies, and went thrice to Madrid to assist at the confinement of the queen of Philip IV. Up till this epoch physicians and surgeons had only been summoned to the lying-in room by midwives who found themselves at the end of their resources, to give help in difficult cases where the child was usually dead and the mother often moribund. Now that it began to be a fashion for women in their ordinary confinements to be under the surveillance of a physician, it became possible for men with their scientific training to study the normal phenomena of natural labour, and through the medium of the printing-press to communicate the results of their observation and experience to their professional brethren. Hence the books of the men already referred to, and of others that appeared later, such as the *Traité complet des accouchemens* of De la Motte, 1721, which is a storehouse of acute observations and wise discussion of obstetric measures. In other countries than France physicians and surgeons began to take up midwifery as a speciality and not as a subsidiary part of their practice, of which they were somewhat ashamed (le Bon, one of the writers whose work is found in Bauhin's *Gynaecia*, says: "Haec ars viros dedecet"), and it was in Holland that a work was produced that has earned

for its author the designation of the Father of Modern Midwifery. Heinrich van Deventer, who practised as an obstetrician at the Hague along with his wife (a Vroedvrow, as he was a Vroedmeester), published in 1696 a preliminary treatise called *Dageraat* (*Aurora*) *der Vroedvrowen*, and in 1701 he followed it up by a more complete second volume, of which the Latin edition that came out simultaneously with the Dutch has a title beginning *Operationes Chirurgicae Novum Lumen Exhibentes Obstetricantibus*. It has the supreme value of being the first work to give a scientific description of the pelvis, and to take some steps towards the development of the mechanism of labour. The "obstetricantes" for whom Deventer wrote are both men and women. In the early part of the 18th century women had still the main and often the sole charge of their parturient sisters; but the practice of having a doctor to superintend or to supersede the midwives kept spreading among the classes who could afford to pay the doctor's fee; and by the time Deventer's treatise was doing its educational work in an English translation, as *The Art of Midwifery Improved*, in 1716, the doctors were getting into their hands the "harmless forceps" with which a living child could be extracted without detriment to the mother, in conditions where formerly her child's life was sacrificed and her own endangered. This life-saving instrument was invented in London, but by a man not of English birth. The Huguenot, William Chamberlen, fled from Paris to escape the St Bartholomew massacres, carrying with him to Southampton his wife, his two sons, and a daughter.

William Chamberlen seems to have been a surgeon, and his descendants through four generations had large and lucrative practices in London. The eldest son Peter, who was old enough when he came to England to be able to attest the birth and baptism of a younger brother, is, on good grounds, credited with being the inventor of the forceps, which for a century was kept a secret among brothers, sons and grandsons. Hugh, indeed, a great-grandson of William, and the translator of Mauriceau, had offered to sell the family secret for 10,000 crowns; but his failure to effect delivery in a test case that Mauriceau put to him led the profession to believe that he was a boastful quack. Palfyn of Ghent, when in Paris in 1723, putting a work on anatomy through the press, laid before the Academy of Science a pair of forceps, which was figured in Heister's surgery in 1724. He has thus the honour of first laying before the profession a midwifery forceps. But his implement was ill-constructed, and never came into general use. Meanwhile the knowledge that the Chamberlens were really possessed of a serviceable instrument must have stimulated other practitioners. Perhaps a colleague with a keen eye may have got sight of it on some occasion, or an intelligent midwife had been able to describe the "tongs" which she had seen one of the family apply. In 1734 Dr Edward Hody published a record of *Cases in Midwifery* that had been written by Mr William Giffard, "surgeon and man-midwife." The dates range from January 1724 to 1731. Amongst the cases are several where he effected the delivery by means of the forceps—"extractor," he calls it—

of which a figure is given; and when Edmund Chapman, who practised first at Halstead and afterwards in London, published his *Treatise on the Improvement of Midwifery* in 1733, he speaks of the use of the forceps as “now well known to all the principal men of the profession both in town and country.”

In the course of the 18th century the development of midwifery in the hands of medical men made greater strides than in all the preceding ages. The progress was accelerated by the establishment of chairs of midwifery in the universities of various countries, Edinburgh taking the lead in the appointment of a professor in 1726, and Strassburg coming closely after in 1728. In Strassburg the chair had the advantage of being at once associated with a clinical service. Lecturing was carried out, moreover, by men who were devoting themselves as specialists in midwifery and the diseases of women and infants, and were succeeding in developing lying-in institutions for the benefit of poor women in labour that became schools of instruction both for midwifery nurses and for medical students. Two new operations came during this epoch to enhance the powers of the obstetrician, viz. symphysiotomy, first introduced by Sigault in Paris; and the induction of premature labour, first carried out by Macauley in London in circumstances described by Denman in the preface to his *Midwifery*. William Hunter in London, Sir Fielding Ould in Dublin, Röderer in Göttingen, Camper in Amsterdam, Baudelocque in Paris, Saxtorph in Copenhagen, and many other authors

contributed to progress by their atlases and their books. But there are three whose names stand out pre-eminently because of the influence they exerted on the whole obstetric world—Levret, Smellie and Boër. Kilian, in his vidimus of the history of midwifery, calls Levret “one of the greatest masters in the department that ever lived.” Of Smellie he says: “Inferior to Levret in nothing, he excels him in much.” Boër he characterizes as “the most meritorious and important of German obstetricians.” Levret improved the construction of the forceps, and widened the sphere of their applicability; Smellie worked in the same direction, and furnished, moreover, descriptions and illustrations of natural and morbid labours that are of classical value; and Boër first clearly placed pregnancy (which Mauriceau, *e.g.* had spoken of as “a nine months’ disease”) and parturition in the category of physiological processes that might be hindered rather than helped by the pragmatical interferences of meddlesome midwives.

Throughout the 19th century midwifery continued to advance, gynaecology grew into a special department with an extensive literature, the mechanism of labour developed under the clinical observations of men like Nägele and the study of such frozen sections of cadavera as were made by Braune, the indications for interference became more clear and the methods of interference more simple and safe, and a whole realm of antenatal pathology and teratology was added to the domain of science, while practitioners learned the art of saving premature and delicate infants by the use

of the incubator and proper alimentation. Every advance in all the cognate sciences was appreciated and applied for the advancement of obstetrics. But there are two achievements which will make the 19th century for ever memorable in the annals of midwifery—the abolition of the pains of labour and the arrest laid on mortality from the so-called puerperal fever. In February 1847 Sir J. Y. Simpson, choosing a case where he had to deliver by turning, put the patient asleep with ether. Seeing that the uterine contractions continued, though the attendant pain was abolished, he proceeded to administer ether in cases of natural labour, and in November of the same year demonstrated the virtues of chloroform, and so furnished the most serviceable anaesthetic, not only to the obstetrician in the lying-in room, but to the surgeon on the battlefield, and to the general practitioner in his everyday work. Ignaz Philipp Semmelweiss, assistant in the maternity hospital of Vienna, was struck and saddened with the appalling mortality that attended the delivery of the women under his care, as many as one (in some months three) out of every ten of the puerperae being carried out dead. He observed that the mortality was much higher in the wards allotted to the tuition of students than in those set apart for the training of nurses. In the spring of 1847 he saw at the post-mortem examination of a young colleague who had died of a poisoned wound, that the appearances were the same as he had too often had occasion to see at the post-mortem examinations of his puerperae. He ordered that every student who assisted a woman in her labour must first

wash his hands in a disinfectant solution of chloride of lime, and in 1848 already the mortality was less in the students' than it was in the nurses' wards. Thus the first light was shed on the nature of the mischief of which multitudes of puerperal patients perished, and the first intelligent step was taken to lessen the mortality. When, some twenty years later, Lister had applied the bacteriological principles of Pasteur with beneficent results to surgery, obstetricians gladly followed his lead, and the 19th century beheld added to the comfort of anaesthetic midwifery the confidence of midwifery antiseptic and even aseptic.

The most exhaustive treatise on the earlier history of midwifery is von Siebold, *Versuch einer Geschichte der Geburtshülfe* (Berlin, 1839). (A. R. S.)

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