

WILLIAM HARVEY—"THE FATHER OF BRITISH MIDWIFERY"

BY

R. W. JOHNSTONE, C.B.E., M.D., F.R.C.S.Ed., F.R.C.O.G.,
*Professor-Emeritus of Obstetrics and Gynaecology, University of
 Edinburgh.*

THE exigencies of the times we have been living through have caused a break of nine years in the sequence of our gatherings—the longest gap in the Society's history for over a century. There has been ample time for me to ponder the address which it is my privilege and duty to offer you, but I have never wavered in the determination, which I made on my appointment as your President in 1939, to try to recall the memory of William Harvey as a man who made a notable contribution to the progress and the character of midwifery in Britain.

In 1921 the late Professor Herbert Spencer chose this as the subject of his Harveian Oration to the Royal College of Physicians of London, and brought to bear upon it his wide knowledge of early medical history. But none of our own presidents, who were identified with obstetrics in their professional life, has done a similar service to our Society—perhaps because of the comparative meagreness of the material for the study of this aspect of Harvey's life and work. In these days of austerity an address founded on meagre materials may perhaps be accepted as a not wholly unsuitable precursor to a dinner similarly characterized! †

At any rate I feel it a duty to make the

* Being the "Oration" delivered to the Edinburgh Harveian Society, 21st May, 1948.

† The oration is customarily delivered immediately before the annual Dinner of the Society.

attempt, although I shall come far short of the hopes that led Thomas Aveling to say in the London Harveian Society in 1875—"Perhaps some future orator will be bold enough to display Harvey in his practical medical life as an able obstetrician, and an original and successful gynaecian, selecting for his theme that of Parturition." It was the same Dr. Aveling who first designated Harvey as "the Father of British Midwifery", and it is to Harvey's memory as such that I wish to pay tribute.

All human values are relative. In attempting to assess a man's achievement, we must take account of the circumstances that lay behind and around it. Admittedly the most epoch-making discoveries in history stand out in their grandeur almost unaffected by such consideration. Harvey's discovery of the circulation of the blood is one of these. Its splendour, as the outcome of one man's powers of accurate observation and clear logical reasoning, as well as its completeness and its profound inherent significance, are so transcendent that a study of the circumstances in which it was made adds comparatively little to it. But it is otherwise with Harvey's contribution to obstetrics, and so I offer no apology for asking you to consider the background of it all in the first place.

Harvey was born in 1578, and it was in 1602 that he returned from Padua, received his doctorate at Cambridge, and settled in London as a physician. In 1657 he died.

As a professional man his background in time is, therefore, the first half of the 17th century, and in place the England of the Stuart Kings.

We all remember our history sufficiently to know that it was a period of great social, political and religious unrest and change, but let me try to orientate our minds more accurately by recalling some of the main features of those days.

Harvey's England was the England of Evelyn's *Diary*, and his London very much the London of Samuel Pepys, who began his immortal diary some two and a half years after Harvey's death. It was a period when such science as the Greeks had bequeathed to the world was still choked by the weeds of superstition and belief in magic which had grown and flourished almost unchecked throughout the long centuries of the Middle Ages. But it was also the time when modern science may be said to have been born, largely under the influence of Harvey's older contemporary, Francis Bacon, who, it will be recalled, abandoned the deductive method of Aristotle and the schoolmen, under which observed facts were subject to interpretation according to preconceived theories, and advocated the method of inductive reasoning by which theories were based on the accumulation of isolated facts obtained by observation and experiment.

In literature it was the period of two of the most formative influences on our mother tongue. For Harvey's early professional years were the time when, as Saintsbury puts it, Shakespeare wrote "almost the whole of his finest work, of the work which most makes Shakespeare Shakespeare"; and it was the age which first welcomed the Authorized Version of the Bible.

The land of Harvey's England was largely open country—much of it wild moor or down- or marsh-land—broken up by great tracts of forest, the remnants of that

original old English forest "that the hand of men had never planted." The rest was open cultivated land over which "the new economy of enclosure was pushing out its green regularity of hedgerow and planted tree." The garden of England was in the making. The old Roman roads had fallen into decay, and such roads as there were had no solid foundation. Travellers on foot or horseback or in the few lumbering carriages of the day were liable to find themselves smothered in dust or wallowing in almost bottomless mud. All forms of transport and communication were slow and bad even between towns and cities, which were very small by our standards. The whole population of England was only some four to five millions, of whom about four-fifths were on the land. The population of Scotland was about half a million. The great middle-class was emerging as merchants and yeomen. The women of the manor-houses had their days occupied with multifarious domestic duties and with spinning, sewing and gardening: for it was at this time that flower-gardens first began to be cultivated. A little lower in the social scale they engaged also in home-industries, such as weaving, and in the labouring classes they shared in the lighter forms of agricultural work. There is no evidence that they took any great interest or part in outdoor exercises or sports, and their education was for the most part elementary.

Sanitary habits were unrestrained and unclean in all classes. There was little understanding and less practice of even the simplest rules of hygiene. They washed little and seldom. Drinking water was often impure and its dangers unknown or disregarded. They slept huddled together in unventilated rooms or closets. Disease was rife. "Plague", whatever its clinical entity may have been, was almost endemic in London and the larger towns, and in Harvey's time it flared up into disastrous

pandemics on at least two occasions. Smallpox, not always clearly differentiated from measles, was a commonplace occurrence. An appalling infant mortality effectually prevented any great increase in the population. Doctors were few, and medicine was still too often dominated by superstition and folklore, although its emergence as a science was imminent under the stimulus of Harvey's discovery and the work of Sydenham, both of whom discarded the shackles of authority and taught that Truth was to be found only by observation and experimentation.

In the realm of obstetrics there was no science at all and very little art. Midwifery was still labouring under the heavy handicap of being regarded as an inferior branch of medical practice, unfit for the attention of physicians or even of surgeons. It was, and had been from time immemorial, the exclusive province of midwives, who were for the most part untutored. Medical help was sought only when the patient was in dire straits, and such help as could be afforded by a doctor, who was himself almost wholly without experience of normal childbirth, was largely limited to destructive operations on the child.

The professional midwives at this time were licensed by the bishops. A reputation for leading a godly, righteous and sober life seems to have been the main qualification for obtaining a license and, as that did not necessarily imply any knowledge of anatomy or midwifery, it is not to be wondered at that thoughtful people protested from time to time. Thus Andrew Boorde in his famous *Brevyary of Health* in 1542, after more or less tacitly accepting the importance of a good moral character, goes on to say "the Byshoppe, with the counsel of a doctor of Physick, ought to examine her and instruct her in that thyng that she is ignorant (of) . . . for and this were used in Englande, there shoulde not halfe so

many women myscary, nor so many chyldren perish . . . as there be. The Byshop ought to loke on this matter."

Nearly a hundred years later, members of that intellectually restless family, the Chamberlens, to whom we owe the priceless gift of the obstetric forceps, showed praiseworthy public spirit in an endeavour to incorporate the midwives into a society which would control their training and licensing. Harvey must have been a fairly senior Fellow of the Royal College of Physicians of London when the project came before that body, but history does not relate what his attitude to it was, and it foundered on the shoals of professional jealousies. Several subsequent efforts along similar lines, including that of the Royal College of Surgeons of Edinburgh in 1726, also proved fruitless for one reason or another. It was not until the early part of the nineteenth century that effective action began and yet another hundred years were to elapse before the training and licensing of midwives came under statutory control.

In Harvey's time, therefore, the midwives were either quite untaught, and took to their profession largely as a means of earning a livelihood, or at the best served a sort of apprenticeship to older midwives, who doubtless taught them a modicum of knowledge derived from practical experience, and probably a deal of superstitious nonsense that the pupils would have been better without. Their great faults appear to have been their lack of patience and their consequent fondness for unnecessary interference, some of it of a brutal character, which imperilled the lives of mothers and infants and encouraged the incidence of puerperal sepsis.

When we pass to the consideration of the medical man's position in midwifery at this period, we have to remember that two centuries were still to pass before obstetrics

became a recognized part of the medical student's training. What knowledge of midwifery those early physicians and surgeons did possess was, therefore, acquired voluntarily by their study of the very scanty literature of the subject, most of it in languages other than their own, or involuntarily by the small and unhappy experience forced upon them when they were summoned by midwives to desperate cases.

In Harvey's early professional days the only printed book on midwifery in English was a translation from the German of Rhodion's *De Partu Hominum*, published in 1540 under the title of *The Byrth of Mankynde*. Harvey himself, of course, was clearly well-versed in the Latin works, mainly anatomical, of his Paduan teachers, and of such writers as Ambroise Paré, but for the less erudite *The Byrth of Mankynde* was the main source of instruction. Despite its many gross errors this was a remarkable book, and it must have fulfilled a purpose of some usefulness in its early days. It actually survived in a series of almost unchanged editions for 130 years—from the time of Henry VIII to the Restoration—but that notable achievement was less a tribute to its own intrinsic educative value than a testimony to the almost complete absence of any enlightened interest in obstetrics on the part of English medical men. In the preface to the first edition there is a reference to the prejudice that existed against the publication of obstetrical teaching in the vernacular owing to false modesty and the fear of encouraging prurient curiosity. "Many think that it is not meete ne fitting such matters to be intreated of so plainly in our mother and vulgar language . . . to the dishonour, as they say, of womanhood and the derision of their own secrets . . . every boy and knave reading them as openly as the tales of Robin Hood."

One other obstetrical book appeared in English in 1612—a translation of *The Happy Delivery of Women*, by Guillemeau, who was one of the more distinguished pupils of Ambroise Paré, himself famous in obstetrics for his revival of podalic version.

While these two books give us an idea of what was then the accepted and available teaching of obstetrics in the early seventeenth century, a better idea of what the practice was like in England may be derived from a manuscript called *Observations in Midwifery—as also the Countrey Midwife's Opusculum or Vade Mecum*, by Percival Willughby, Gentleman. Willughby was about twenty years junior to Harvey, and from his references to books published after Harvey's death, we may assume that his own work was compiled in his later years. It was, however, not published in print until 1863. Willughby passed the most of his professional life in Derby, except for five years in London, and he was evidently a much sought-after consultant in midwifery. He knew Harvey personally and clearly had a great affection for him as a man and a profound admiration for him as an obstetric physician. He tells of how in 1642 "there came into my house at Darby my honoured good friend, Dr. Harvey", and of how they "talked shop"—mostly about "several infirmities of the womb".

Incidentally, one wonders what Harvey was doing at Derby, for it was in the January of that year that Charles I had fled from London to York after his ill-starred attempt to impeach the five members of the House of Commons. Harvey is said to have accompanied him, being entrusted with the care of the King's health not only by Charles's own wish but also at the request of the Parliament. The Civil War opened in August at Edgehill where, as every Harveian knows, Harvey was

present. Perhaps his royal master was on his way south to raise his standard at Nottingham, when Harvey dropped in upon Willughby.

Willughby specifically states that he knows "none but Dr. Harvey's directions", so that we may safely assume that his own teaching was at least closely parallel to Harvey's; and if I quote freely from him, it is because his writings deal much more fully with the practical side of midwifery than does such of Harvey's own work as has come down to us.

Early in his *Observations* Willughby describes the foetal membranes and "the waters in which the infant swimmeth and with which the foetus is nourished . . . Most of the humour is commonly spent near the approaching time of delivery, and then it is probable that the foetus desireth to get forth, by reason that his provisions fail him . . . Then through the infant's enforcing and the paines of the mother the womb openeth." As we shall see, all these views were shared by Harvey. Willughby then says "after the child is born the midwife must fetch away the secondine"—apparently implying that the prompt manual removal of the placenta was the accepted practice, for he later says, in a tone of something like surprise, that "there bec some midwives that never offer to fetch the after-birth, but suffer Nature to expel it, and their women have done well." But he goes on to state that he was moved to describe the placenta and membranes "for that there be some simple midwives that imagine that the child oft sticketh to the woman's back; and they do not blush to affirme their ignorances, how they have separated the child from sticking to the back." As a sidelight on the practice of midwifery such unnecessary interference explains much.

The process known in modern obstetrical jargon as "ironing out the perineum" was

apparently used by the midwives at the beginning of labour. Willughby condemns it. "In my first days of ignorance," he says, "I thought it was the best way to suffer midwives to stretch the labia vulvae with their hands and fingers when the throwes approached. But friendly nature in time shewed me my mistaking error. Through the remoteness of severall places whereunto I was called, the women in the meane time keeping the labouring woman warm and quiet, and the midwife desisting from using violence, by such usage I found the women oft delivered before my coming; and so it was made manifest to mee that pulling and stretching of their bodies . . . did ever much hurt and never any good to women in distress to procure and hasten labour."

This reference to the women keeping the patient warm and quiet is one of several references to a feature that cannot fail to strike anyone who studies the medieval pictures of the lying-in chamber, which form one of the main sources of our knowledge of that period—namely the quite unnecessary number of persons in the room. Willughby speaks in one place of "going with the midwife apart from the company" to question her about her patient; and of another patient he "desired her, in the time of her travaile, not to have her chamber thronged with much company."

The presence of a man—even a physician—was in those days considered not merely an affront to the proprieties but as contrary to the interests of morality. When it was deemed necessary to call in medical assistance, great pains had to be taken to darken the room and to arrange the bed-curtains in such a way that the patient should avoid the humiliation of seeing a man in her bedchamber. All manual interference had to be performed under the bedclothes, so that the unhappy doctor was guided only by his sense of touch. To add

to his discomfort the lower corners of the bedcover or sheet were often tied round his neck.

Willughby throws an unconsciously amusing sidelight on this sort of thing when he records how his younger daughter, who practised as a midwife, when engaged to attend a lady of quality, was anxious because she had diagnosed a breech presentation. When delivery was approaching, he tells us, "at my daughter's request, unknown to the lady, I crept into the room on my hands and knees and returned, and it was not perceived by ye lady". In his haste to retreat before he was detected his examination was faulty and he diagnosed a head presentation; but his daughter was not satisfied, so ultimately, he says, "I crept privately the second time into ye chamber, and then I found her words true". That occurred in London, and perhaps the proprieties were less strictly observed in the provinces, for in his other cases there is no mention of any such precautions.

Willughby gives several instances of the barbarity of midwives. "A certain midwife carried a long knife secretly in her sleeve, with which she cut the womb whilst the woman was in great pain"—presumably an incision of the cervix. And again—"At the time of her travaile the child proffered an arme. This unnaturall birth dismai'd the mother and troubled the midwife. My company and assistance were wished for . . . but . . . she was perswaded to put herself under the hands of a wicked woman, that took upon her to free her of the child. This woman first cut off the childe's arme. Afterwards she divided the child into severall parts, to pull it forth by pieces. Her knife in doing this work was broken with many great notches as she hacked in her body. All which a Gentlewoman told mee, that was there present."

This reference to the presentation of an

arm is only one of a number so remarkable that we are driven to conclude that a transverse lie was one of the more common complications of labour. Probably it was related to the great prevalence of rickets affecting the pelvis, for it will be remembered that the first classical account of that disease was published in 1650 by Francis Glisson.

Eclampsia was not recognized as an entity in those days, but Willughby mentions several cases of convulsions, almost all fatal. In antepartum haemorrhage his treatment was immediate delivery, if need be by podalic version. Of postpartum haemorrhage Willughby gives a graphic account, and indicates that the accepted treatment was to give the yolk of an egg and either "to lay a napkin soaked in vinegar over the loins or to lay upon each groine a skene of raw silk moistened in water." He then quotes a list of equally futile remedies recommended by the ancients, and very properly concludes that "where flouding issueth with a stream, I shall not easily be perswaded that filipendula roots or succinum (amber) with yolkes of egges or such like will at all availe". Then strangely enough he lapses into something more worthy of Nicholas Culpepper. "I shall give more credence," he says "to the dung of asses, or stone horses, or of hogs, internally taken." He then continues "If possible I heartily could wish that some worthy practicer would be pleased to direct some powerfull wayes or medicines to bridle this raging, destroying evil, and all succeeding ages would give him thanks." Shrewdly he observes, "This evil is never thought on but when casually it happeneth, so that then convenient medicines bee to seek and ever wanting . . . I confesse my ignorance and beleve that there is no other but God alone that can do this work to help the woman." Finally, with an amusing anticlimax, he concludes, "I suppose that astringent

injections may be somewhat available"!

Willughby was a great believer in podalic version and breech extraction in all cases of contracted pelvis, and gives full instructions how to proceed. He repeatedly stresses that breech extraction is less painful to the mother than head-first delivery—a point which is probably true and must have been of great importance in days when there were no anaesthetics and no forceps. He preferred the use of the hand to any instrument, but has a good word for the crotchet when the child is dead, although with due warning about the danger of wounding the mother. To the "high and lofty conceited midwives, that will leave nothing unattempted to save their credit and to cloak their ignorance", he says, "let mee advice such women to learn to make use of the crotchet, rather than pothooks, pack-needles, silver spoons, thatchers' hooks and knives to shew their imagined skills . . . I have known the midwives and the places where they have used these follies to their women."

Caesarean section he deprecates. "I do not like it," he says, ". . . a practice to be condemned . . . I therefore pass it over with silence, being unwilling . . . to embolden any in these works of cruelty."

Willughby quotes Harvey no fewer than sixteen times, and frankly acknowledges his debt to his writings in the following terms: "Dr. Harvey's learned observations about the birth ought to be esteemed for their worth and goodness. The oft reading of them with a due observing of his method will be sufficient to make a midwife to understand her calling. In his workes hee wisheth midwives not to be too busy at the first approaching of labour, by striving to hasten or promote a sudden or quick birth; but willeth them patiently to wait on Nature, to observe her ways, and not to disquiet her for that it is the sole and onely work of Nature . . . I know none but

Dr. Harvey's directions and method, the which I wish all midwives . . . to read over and over again, and in so doing they will better observe and understand the sayings and doings of that most worthy, good and learned Dr. whose memory ought to be had for ever in great esteem with midwives and child-bearing women."

I have quoted Percival Willughby at some length because he gives us a clear picture of the practice of midwifery in the seventeenth century, as well as an estimate of the value placed on Harvey's obstetrical writings by a highly intelligent contemporary, who shows evidence in his own writings of familiarity with all the obstetrical literature, both English and foreign, of his day. But let us now turn to Harvey's own work.

What he writes on midwifery proper is contained in three brief essays on "Parturition", on the "Membranes and Fluids of the Uterus", and on "Conception", which form the concluding chapters of his long *Exercises on the Generation of Animals*, published in 1651 when Harvey was an old man in retirement. The *De Generatione* is devoted to natural history and embryology, and while it reveals Harvey's genius in his transcendent capacity for taking pains and the almost meticulous accuracy of his observations, it is in other respects on a level below that of his immortal essay *De Motu Cordis*. It is unfinished, but the nature and magnitude of the subject are such that at no epoch could the observations of any man claim to be complete. When we remember that Harvey delayed the publication of his *De Motu Cordis* for years until he could regard it as complete and definitive we may well sympathize with his reluctance to permit his friend, Sir George Ent, to supervise the publication of what he probably regarded as merely an inchoate collection of notes on a vast subject.

It is below the level of the *De Motu Cordis* also in that the issues tend to be confused with speculative suggestions, and that throughout there is evidence of much less of that freedom from the bondage of ancient authority which is one of the glories of his earlier work. The teaching of Aristotle and of his own Paduan professor, Fabricius of Aquapendente, is everywhere examined at tedious length. "When I find I can make nothing of Aristotle upon a particular topic," he says, "I straightway turn to Fabricius," and only then does he proceed to unfold his own views. Nevertheless when we recollect that Harvey had no microscope except a simple lens to aid him, we cannot fail to be impressed by the greatness and freshness of his contribution to embryology. He it was who first propounded the generalization "*ex ovo omnia animalia.*" He it was who first formulated in English the doctrine of epigenesis—that is to say, the growth and development of an organism from a simple germ as opposed to the then prevalent view that the germ contained a pre-formed miniature model of the organism, which merely required to be, as it were, unfolded. Competent commentators have pointed out that Harvey's conception of epigenesis falls far short of what is now meant by that term, and indeed differed little from that of Aristotle. But it is worth remembering that it took two hundred years of subsequent experience with the compound microscope to establish the doctrine beyond criticism, so that we might say that the science of embryology itself developed by a process of intellectual epigenesis.

It was Harvey who first described the difference in colour between the lungs of a foetus which had breathed after birth and of one which had not—a point familiar to students of medical jurisprudence.

Regarding the problem of conception Harvey not unnaturally confesses himself

baffled, for without a compound microscope it was impossible for him to see the spermatozoon. He falls back on the conjecture that conception is the result of an "idea" excited by coitus, and somewhat analogous to the conception of an idea in the brain. Incidentally he describes the condition of pseudopregnancy, which came to the fore again recently in the early days of sex-hormonology.

But it is the short chapter on parturition that interests us at this time. This was the first original work on the subject by an Englishman, and that surely justifies his being called "the Father of British Midwifery." It seems probable, however, that he wrote more upon the subject in his missing manuscript, *Medical Observations*, for he specifically refers to it and quotes one case-history from it.

To analyze the chapter in detail would weary a hungry audience, for it would entail repetition of the sort of things I have already quoted from Willughby. What has struck me most in perusing it is the almost amusing way in which, at every possible point, Harvey dashes off into comparisons drawn from his favourite subject of comparative anatomy and physiology. That, of course, is where his greatest interest lay. We must not forget that Harvey was primarily an anatomist. His genius as such lay in his concentrating upon function rather than form, and after the functions of the heart and blood-vessels his main interest was in the functions of the reproductive organs. I imagine that his interest in midwifery derived from that. Moreover, if we keep in mind the narrow scope that was open to the medical practitioner in midwifery in his day, we are driven to the conclusion, which seems to me to be confirmed by his writings, that Harvey's familiarity with *abnormal* midwifery was probably greater than his personal experience with natural delivery.

After all, Harvey lived at the very beginning of the period of two hundred years that saw the care of the pregnant and parturient woman pass gradually from the midwife to the medical practitioner.

Of the way in which the outlook and the interest of the naturalist dominate those of the obstetrician let me give you two examples. He states that as labour approaches "the cartilaginous attachments of the pelvic bones so lose their rigidity that the bones themselves yield readily to the passage of the foetus, and thus greatly increase the area of the hypogastric region". That had been the teaching ever since the days of Soranus fifteen centuries earlier, but as a matter of fact it is a phenomenon much more recognizable in the lower animals than in the human species. Again he says that "although in women, as a general rule, the membranes are ruptured before the escape of the foetus, it is not universally so, nor does it hold in the case of other animals which bring forth their young enveloped in the membranes." He then goes on to say that this latter kind of birth appears to him "by far the most natural"—a point which no one whose interests were primarily obstetrical would be likely to dwell upon—and supports his view by adding that "it is like the ripe fruit which drops from the tree without scattering its seed before the appointed time. But when it is otherwise, and the placenta subsequently to birth adheres to the uterus, there is great difficulty in detaching it, grave symptoms arise, fetid discharges and sometimes gangrene occur, and the mother is brought into imminent peril."

Harvey believed in superfoetation and gives several instances of its apparent occurrence. He thought the onset of labour was due to the liquor amnii, admirably suited, as he believed, to the nourishment of the foetus, either failing or becoming

contaminated with excrementitious matter. He supports the Hippocratic view that the birth of the child is largely the result of its own efforts, but he admits that the uterus also plays a part, as for example when the child is dead. "It is the foetus itself," he says, "which, with its head downwards, attacks the portals of the womb, opens them by its own energies, and thus struggles into day." The naturalist then emerges and he bolsters up his argument by reference to birds and insects and fishes which "are born by their own will and powers".

Harvey gives a clear account of the involution of the puerperal uterus, and joins with Fabricius in marvelling at this process. "It is indeed most wonderful," he says (and every obstetrician will echo his words) "and quite beyond human reason how such a mass can diminish to so vast an extent in the space of fifteen or twenty days"—and had the clinical thermometer been in existence, he might have added "without any rise of pulse-rate or temperature." He points out that such rapid absorption does not occur with other tumours or abscesses, and concludes "Yet this is not more worthy of admiration than the other works of Nature, for all things are full of God, and the Deity of Nature is ever visibly present."

The placenta he thought to be an organ akin to the liver—the *jecur uterinum* of the ancients—and the *mammae*, serving to provide nutriment for the foetus. He agrees with Arantius that there is no direct communication between the foetal and the maternal blood and, incidentally, it will be remembered that in the *De Motu Cordis* he described the foetal circulation with remarkable accuracy. At this point the naturalist thoroughly enjoys himself in describing the varieties of placentation in different species of animals.

On the actual management of labour Harvey writes but little—so little indeed

that we are compelled to conclude that Willughby must have had access to his lost *Medical Observations*. But what he does say is timely and wise, especially when read against the background of the sort of practice by midwives mentioned by Willughby. It amounts to the advocacy of those greatest of desiderata in all obstetricians—patience and gentleness. “Midwives are much to blame,” he says “especially the younger and more meddling ones who make a marvellous pother when they hear the woman cry out with her pains and implore assistance, daubing their hands with oil, and distending the passages, so as not to appear ignorant in their art—giving besides medicines to excite the expulsive powers; and when they would hurry the labour, retarding it and making it unnatural, by leaving behind portions of the membranes or even of the placenta itself, besides exposing the wretched woman to the air, wearying her out on the labour stool and making her, in fact, run great risk of her life. In truth it is far better with the poor and those who become pregnant by mischance, and are secretly delivered without the aid of a midwife; for the longer the birth is retarded the more safely and easily is the process completed.”

In trying to summarize Harvey’s contribution to midwifery I would say this. Apart from his work in the kindred subject of embryology, upon which I would not venture to comment, and apart from the mere fact of his priority as the first Englishman to write on midwifery, we may claim that he first set the processes of pregnancy and parturition—of “generation”, to use his resounding classical term—in alignment with physiology, by bringing to bear upon them his exceptionally wide knowledge of what we would now call biology. That alone was a great achievement, and in his

own day his teaching must have come as a ray of sunlight piercing and dispersing the fog of ignorance and superstition.

In the application of medicine and surgery to midwifery he laid down the great governing principles of patience and gentleness, and it is inspiring to think that these characteristics, coming so-to-speak from the fountain-head, have persisted as features of British midwifery to the present day. We may safely interpret Harvey’s advocacy of patience as meaning not a blind waiting upon Nature, but waiting with a watchful expectancy which does not preclude a readiness to interfere when Nature shows signs of faltering. Such was the natural evolution of his teaching that has come down to us through men like William Smellie, William Hunter and Thomas Denman. It is recorded of one of Denman’s pupils, Johann Boër, sometimes called “the Father of German Midwifery”, that when he became the first professor of the subject in Vienna, he adopted British methods, because “he had learnt in France what Art, in England what Nature, can do.”

British midwifery was indeed fortunate in having a man like Harvey as its “father”, and if the quantity of his writings on midwifery seems to be in inverse proportion to their quality, what matters it? It is quality, not quantity, that commands remembrance. What one of Harvey’s great contemporaries, Ben Jonson, said about the lives of men applies with at least equal force to their writings:

“It is not growing like a tree
In bulk doth make men better be;

* * *
* * *

In small proportions we just beauties see;
And in short measures, life can perfect be.”

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THE OBSTETRICS AND GYNÆCOLOGY OF WILLIAM HARVEY.

BY F. H. STUART, M.D.

"A good fame is as the beams about the sun, or the glory about a holy picture that shows it to be a saint: though it be no essential part, it rises from the body of that virtue which cannot choose but shine and give a light through all the clouds of error and destruction."—FELLTHAM.

The fame of Harvey, as the father of English obstetrics, has been overshadowed by the greater fame of being the discoverer of the circulation of the blood. The latter was his first and greater work.

I have called him the father of English obstetrics. He was the first Englishman who wrote of obstetrics in his own language. The publication of his work upon "The Generation of Animals," and the "Essays on Parturition, on the Membranes and Fluids of the Uterus, and on Conception," published just two hundred and thirty years ago, and thirty-three years after his work on the "Motion of the Heart and Blood," may be said to be the foundation of the study of the subject. His associates were proud to record during his lifetime, on the pedestal of the bust erected to his memory, in the hall of the College of Physicians, "that he gave

motion to the blood, origin to animals, and must ever be hailed *Stator Perpetuus*."

The story of the publication of his obstetrical writings is told by his friend and advocate, Dr., afterwards Sir, George Ent, in a way that reflects Harvey's modesty as well as his sincere devotion to science, and his industry, unabated in old age. Ent's visit to Harvey, then dwelling not far from London, is thus related by him:

"I found him, Democritus like, busy with the study of natural things, his countenance cheerful, his mind serene, embracing all within its sphere. I forthwith saluted him and asked if all were well with him? 'How can that be,' said he, 'whilst the Commonwealth is full of distractions, and I, myself, am still in the open sea? And truly,' he continued, 'did I not find solace in my studies, and a balm for my spirit in the memory of my observations of former years, I should feel little desire for longer life. But so it has been, that this life of obscurity, this vacation from public business, which causes tedium and disgust to so many, has proved a sovereign remedy to me.'"

Dr. Ent reminded him that he had said that he had never dissected any animal but that he made some new discovery. To this he replied:

"* * * "Though much has already been made out by the learned men of former times, I have still thought that much more remained behind, hidden by the dusky night of nature, uninterrogated. * * * Nature, however, is the best and most faithful interpreter of her own secrets; and what she presents, either more briefly or obscurely in one department, that she explains more fully and clearly in another. No one indeed, has ever rightly ascertained the use or function of a part who has not examined its structure, situation, connections by means of vessels, and other accidents in various animals, and carefully weighed and considered all he has seen." * * * "Shall we imagine * * * that all knowledge was exhausted by the first ages of the world? If we do, the blame verily attaches to our indolence, nowise to Nature."

Dr. Ent then expressed the curiosity of the learned world as to his studies, and that they were eagerly looking for his farther experiments.

"And would you be the man," said Harvey, smilingly, "who should recommend me to quit the peaceful haven where I now pass my life, and launch again upon the faithless sea? You know full well what a storm my former lucubrations raised. [The treatise on the Circulation of the Blood.] Much better is it oftentimes to grow wise at home and in private, than by publishing what you have amassed with infinite labor to stir up tempests that may rob you of peace and quiet for the rest of your days."

At length he was persuaded first to show the works to his friend, then to give them to him, "with full authority either speedily to commit them to the press, or to suppress them till some future time." Once possessed of the treasures, Ent took his leave, "feeling like another Jason laden with the golden fleece."

The spirit which animated Harvey in all his work is beautifully expressed in these words from the Introduction to the Exercises on Generation:

"What I shall deliver in these, my Exercises on Animal Generation, I am anxious to make publicly known, not merely that posterity may perceive the sure and obvious

truth, but farther, and especially, that by exhibiting the method of investigation which I have followed, I may propose to the studious a new, and unless I mistake, a safer way to the attainment of knowledge."

"For although it is a new and difficult road in studying nature, rather to question things themselves than, by turning over books to discover the opinions of philosophers regarding them, still it must be acknowledged that it is the more open path to the secrets of natural philosophy, and that which is less likely to lead into error."

"Nor is there any just cause wherefore the labor should deter any one, if he will but think that he himself only lives through the ceaseless working of his heart? Neither, indeed, would the way I propose be felt as so barren and lonely, but for the custom, or vice, rather, of the age we live in, when men inclined to idleness, prefer going wrong with the many, to becoming wise with the few, through dint of toil and outlay of money. * * * When we acquiesce in the discoveries of the ancients, and believe (which we are apt to do through indolence) that nothing farther remains to be known, we suffer the edge of our ingenuity to be taken off, and the lamp which they delivered to us to be extinguished. * * * Truly in such pursuits it is sweet, not merely to toil, but even to grow weary, when the pains of discovering are amply compensated by the pleasures of discovery. * * * It were disgraceful, therefore, with this most spacious and admirable realm of nature before us, and where the reward ever exceeds the promise, did we take the reports of others upon trust, and go on coining crude problems out of these and on them hanging knotty and captious and petty disputations. Nature is herself to be addressed; the paths she shows us are to be boldly trodden; for thus, and whilst we consult our proper senses, from inferior advancing to superior levels, shall we penetrate at length into the heart of her mystery."

There is much more in the same lofty vein in this Introduction. I quote this much to whet the appetite of those who can possess his works, and to give to those who cannot, a taste of the writings of him who is thus referred to by Mr. Luther Holden in the last Hunterian Oration:

"As English sailors were proud of Nelson, English soldiers of Wellington, English poets of Shakespeare, English physicians [were proud of] Harvey."

Of all the departments of medical study, none were so early or so thoroughly pursued as anatomy. Before Harvey went to Padua under Fabricius, anatomy had already been developed to a degree hardly surpassed to this day, by such illustrious students as Jacobus Carpus at Bologna, Jacobus Sylvius at Paris, Vesalius at Padua, with Columbus, Eustachius, Fallopius, and Paré, whose names enter into the nomenclature of the science. After spending five years in enthusiastic study in such a school, it was to be expected that he would devote himself to anatomy as a life-long pursuit. We wonder at and admire the boldness and certainty of his obstetrical and gynæcological practice. He became the teacher of his own and succeeding ages in these departments only through his thorough familiarity with the anatomy of the region and organs he had to practice upon. Those who wish to impress upon students the value and importance of a thorough knowledge of anatomy can

find no example in the annals of medicine which so perfectly illustrates these as the life and work of Harvey.

In his work upon Generation are found many experiments and observations. They are chiefly with reference to the development of the chick. They illustrate his powers of observation.

I believe that he first pointed out the development of the chick from the cicatricula, which he describes as follows:

"There is a white and very small circle apparent in the investing membrane of the vitellus, which looks like an inbranded cicatrice, which Fabricius therefore calls cicatricula; but he makes little of this spot. * * The cicatricula in question is extremely small, not larger than a tiny lentil, or the pupil of a small bird's eye, white, flat and circular. This part is also found in every egg. * * If you sometimes find two cicatriculæ in a large yolk, * * this might perhaps lead to the production of a monster and double foetus. * * It is, in fact, the most important part of the whole egg, and that for whose sake all the others exist; it is that, in a word, from which the chick takes its rise." (Works of Harvey, Sydenham Soc. Ed., p. 215.) See also p. 396, bottom, and p. 407.

He touches upon and expresses very clearly his ideas of spontaneous generation in these words:

"Moreover, they who philosophize in this way [*i. e.*, seek for the cause of diversity of parts in diversity of matter whence they arise] assign a material cause for generation, and deduce the causes of natural things either from the elements concurring spontaneously or accidentally, or from atoms variously arranged; they do not attain to that which is first in the operations of nature and in the generation of animals, viz.: they do not recognize that efficient cause and divinity of nature which works at all times with consummate art, providence and wisdom, and ever for a certain purpose, and to some good end; they derogate from the honor of the Divine Architect, who has not contrived the shell for the defense of the egg with less of skill and of foresight than He has composed all the other parts of the egg of the same matter, and produced it under the influence of the same formative faculty." (Op. cit., p. 207.)

He comments with much quaintness and beauty of illustration upon the physiognomy of eggs, and asserts that

"We should not, therefore, be greatly surprised, when we see those who have experience, telling us by what hen each particular egg in a number has been laid."

He shrewdly adds:

"I wish there were some equally ready way from the child of knowing the true father." (Op. cit., p. 219.)

The order of nature in the development, life, and decay of the individual and the perpetuity of the species, is thus beautifully sketched:

"Of the growth and generation of the hen's egg enough has already been said; and we have now to lay before the reader our observations on the procreation of the chick from the egg--a duty which is equally difficult, and profitable, and pleasant. For in general, the first processes of nature lie hid, as it were, in the depths of night, and by reason of their subtlety escape the keenest reason, no less than the most piercing eye."

“Nor in truth it is a much less arduous business to investigate the intimate mysteries and obscure beginnings of generation than to seek to discover the frame of the world at large, and the manner of its creation. The eternity of things is connected with the reciprocal interchange of generation and decay; and as the sun, now in the east and then in the west, completes the measure of time by his ceaseless revolutions, so are the fleeting things of mortal existence made eternal through incessant change, and kinds and species are perpetuated though individuals die.” (Op. cit., p. 225-6.)

Again, in another place, he says:

“The number of eggs serves the same end as abundance of conceptions among viviparous animals—they secure the perpetuity of the species. Nature appears to have been particularly careful in providing a numerous offspring to those animals, which by reason of their pusillanimity or bodily weakness, hardly defend themselves against the attacks of others. She has counterbalanced the shortness of their own lives by the number of their progeny. * * * All generation as it is instituted by nature for the sake of perpetuating species, so does it occur more frequently among those that are shorter-lived and more obnoxious to external injury, lest their race should fail.” (Pp. 443-4.)

There are some points in his work upon Generation to which I call attention. They show his close observation and strong powers of reason. What he held as clearly demonstrated to himself, but which he manifestly fears will not be accepted by his readers, later investigations have made plain. In discussing the share each sex has in generation, he concludes:

“It is certain that eggs of every description, prolific and barren, are engendered and formed by the hen singly, but that fecundity accrues from the male alone; the cock, I say, contributes neither form nor matter to the egg, but only that by which it becomes fertile and fit to engender a chick.” (Op. cit., p. 294.) See also p. 302.

Again, in relation to the individuality of the offspring, having independent organs, and that these organs are active before birth, he says:

“The embryo in the egg boasts of its own blood, formed from the fluids contained within the egg; and its heart is seen to pulsate from the very beginning.”

A little farther on he makes this remark, which seems to me to hint at the modern idea of the structure of the placenta:

“I believe, indeed, that it will be held as sufficiently proven, that even the foetus of viviparous animals still contained in the uterus is not nourished by the blood of the mother, * * but boasts of its own peculiar vital principle and powers, and its own blood, like the chick in ovo.” (Op. cit., p. 298.)

In another place he says more plainly:

“The foetus of a viviparous animal draws its nourishment from the uterus whilst it is connected with its mother, like a plant by its roots from the earth.” (P. 446.)

And again he says:

“It clearly appears that the foetus in utero is no more nourished by its parent's blood than is the suckling afterwards.”

The observations of Darwin and Wallace in regard to natural selection,

and the uses of certain parts, are but repetitions of observations made by Harvey. (Referred to on p. 425, as well as many other places.)

He studied the subject of Generation from every point of view:

"In reference to * * family likeness," he says, "we may be permitted to inquire as to the reason why the offspring should at one time bear a stronger resemblance to the father, at another to the mother, and at a third, to progenitors, both maternal and paternal, further removed? particularly in cases where * * at the same moment several ova are fecundated. And this, too, is a remarkable fact, that virtues and vices, marks and moles, and even particular dispositions to disease, are transmitted by parents to their offspring; and that while some inherit in this way, all do not. Among our poultry, some are courageous and pugnaciously inclined, and will sooner die than yield and flee from an adversary; their descendants, once or twice removed, however, unless they have come of equally well-bred parents, gradually lose this quality; according to the adage, 'the brave are begotten by the brave.' In various other species of animals, and particularly in the human family, a certain nobility of race is observed; numerous qualities, in fact, both of mind and body, are derived by hereditary descent." (Op. cit., p. 429.)

"By this same law the son is born like his parents, and virtues which ennoble and vices which degrade a race, are sometimes passed on to descendants through a long series of years. Some diseases propagate their kind, as lepra, gout, syphilis, and others. But why do I speak of diseases, when the moles, warts, and cicatrices of the progenitor are sometimes repeated in the descendant after many generations?" (P. 582.)

In Exercise the Sixty-second is a fine specimen of analogical reasoning upon the zoological adage: "Omne vivum ex ovo," which concludes (p. 460) with this profound generalization:

"For perfect nature, always harmonious with herself in her works, has instituted similar parts for similar ends and actions: to arrive at the same results, to attain the same forms, she has followed the same path, and has established one and the same method in the business of generation universally."

Having considered at length the subject of Generation in the careful study of the hen's egg, he proceeds to give the anatomy of the genital organs, instituting constant comparison between the hind and the human female. King Charles I., whose physician he was, being fond of hunting, had large herds of deer, and from these supplied Harvey with an abundance of material for his physiological and anatomical studies. The picture which represents Harvey explaining the circulation of the blood to his majesty, will be called to mind by this fact.

In connection with the anatomy of the uterus occurs this remarkable passage, which shows the boldness and originality of his gynæcological practice:

"In all animals this uterine orifice [os uteri] is found obstructed or plugged up in the same way as is wont to be in women, among whom we have sometimes known the outlet to be so much constricted that the menses, lochia, and other humors were retained in the womb, and became the exciting cause of most severe hysterical symptoms.

In such cases it became necessary to contrive a suitable instrument with which, the os uteri being opened, the matters that stagnated within were discharged, when all the accidents disappeared."

Whether the instrument referred to was a Peaslee's, or Hank's Dilator, *i. e.*, graduated sound, or was a Wilson, or Sims, or Ball, or Miller, or Ellinger, for immediate dilatation, does not appear. But the principle is here clearly enunciated. He also refers to his practice of the use of intra-uterine injections:

"By this contrivance injections could also be thrown into the cavity of the uterus, and by means of these I have cured internal ulcers of the womb, and have occasionally even found a remedy for barrenness."

(Was this by practicing artificial insemination, as was so strenuously advocated by Sims a few years ago?)

It would appear as if dilatation of the uterus and intra-uterine injections were common modes of practice with Harvey, for he has observed that in cases of retention of the lochia,

"When art did not avail to promote its exit, the woman has presently died."

And again, in the case of a

"Noble lady in childbed being attacked with fever for want of the ordinary lochial discharge, had the pudenda swollen and hot; finding the uterine orifice hard and firmly closed, I forcibly dilated the part by means of an iron instrument sufficiently to admit of my introducing a syringe and throwing up an injection. The result was favorable."

In the case of the wife of a doctor of divinity, healthy but barren, and yet desirous of offspring, who had fared at the hands of others not unlike the woman in the Scriptures, who had an issue, and had suffered many things of many physicians, and was nothing bettered, at length consulted Harvey, he dilated and injected the uterus repeatedly, and milder means failing, at length added to the former injection "a little Roman vitriol," which at once excited powerful contractions, and he was obliged to resort to "the application of soothing and anodyne remedies" to secure relaxation. This patient likewise recovered.

What is an anomaly in the human female, a bicorn uterus, from incomplete union of the Müllerian ducts, is stated by Harvey to be the normal condition in all quadrupeds, except the ape and the solipeds. Tubal pregnancy is thus referred to as being analogous to conception in the cornua of the lower animals:

"For as many of the lower animals regularly conceive in the cornua uteri, so do women occasionally carry their conceptions in the cornu, or this tube [Fallopian], as the learned Riolanus has shown from observations of others, and as we ourselves have found it with our own eyes."

The description of the uterine ligaments, of the broad ligaments, sup-

porting the ovaries (called by him testes), and the uterine vessels is graphic. The enlargement of the uterine vessels during pregnancy is pointed out as being "relatively larger and more numerous than in any other part of the body," and also that the arteries are more numerous here than the veins, and that air blown into the arteries makes its way into the neighboring veins.

The development of the fœtus in the cornu of the uterus of the doe is described with minuteness and with frequent comparison with the human fœtus. He found females were frequently in the right cornu, and males in the left, and yet he does not believe that the sex is determined by this circumstance, or, as we would say, that the ovaries—right and left—determine the sex. It was twenty-two years after the publication of Harvey's work (1673) that Dr. Graef described the follicles of the ovary. Of these Harvey knew nothing, and he repeatedly asserts that he could never see any change whatever in the ovaries even during the rutting season.

In the body of a woman who died of fever he found an embryo of about fifty days of gestation. He describes it as being an hermaphrodite. Externally, the sex seemed to be of a male; internally, of a female. The description is very minute, and shows that at that period the sex is not differentiated externally.

He notes the change in color of the lungs after they have once been inflated, and states that, "by this indication is it known whether a mother has brought forth a living or dead child."

In regard to parturition, he considers the changes that take place in the mother in preparation, as it were, for labor and the changes in position of the fetus.

He describes the descent of the uterus, the "lightening before labor," and states that, at the same time, not only do the soft parts become "relaxed and dilatable," but that the pelvic articulations become relaxed, and "yield readily to the passage of the fœtus." These, and the appearance of true milk in the breast—"milk, I mean, of a character suitable for the sustenance of the offspring"—he regards as certain evidence that "delivery is not far distant."

He endorses Aristotle in saying that the period of utero-gestation varies with the size of the animal: "Each animal has a definite magnitude, beyond which it cannot pass." He thus hints at the fœtus being, in part, the cause of labor.

"In the human species," says the philosopher [Aristotle], "is the period of utero-gestation subject to great irregularity. In other animals there is one fixed time, but in man several; for the human fœtus is expelled both in the seventh and tenth months, and at any period of pregnancy between these; moreover, when the birth takes place

in the eighth month, it is possible for the infant to live.' " "There are, however, some animals in whom there is no fixed time for production, and this is chiefly the case with those which are called domestic, and live with the human species. These both copulate and produce their young at uncertain seasons, and the reason probably is to be sought for in the larger quantity of food they consume, and the consequent inordinate salacity. But in these, as in the human species, the process of parturition is often difficult and dangerous."

Unusually early births and instances of prolonged gestation are related. Vesalius relates that "a girl of his time, who, although a five-months' child, had arrived at the age of twelve years." Another, a male, was born at the commencement of the sixth month, "and his frame was so slight and fragile that his mother found it necessary to wrap him up in cotton until such time as he was able to bear the ordinary dress of infants." Of late births, instances of eleven and thirteen months' utero-gestation are given :

"There was, indeed, not so long since, a woman in our own country who carried her child more than sixteen months, during ten of which she distinctly felt the movements of the fœtus, as, indeed, did others, and at last brought forth a living fœtus."

"These are rare contingencies," he adds, and further says, that "it is impossible to deny that many women, either for purposes of gain, or from fear of punishment, have simulated pregnancy, and not hesitated to swear to the truth of their assertion; others, again, have frequently been deceived, and fancied themselves pregnant, whilst the uterus has contained no product of conception."

Instances of superfetation in his own practice are related, and others quoted from Aristotle. One of the latter was of a woman who "became pregnant of twins, and conceived another by superfetation." The twins were well formed, and came to full term, but the third conception was at the fifth month, and died immediately. He also had experience of cases of death of fœtus in utero, the fragments of which came away months afterwards. He relates one remarkable case of "a noble lady who had borne more than ten children, and in whom the catamenia never disappeared, except as a result of impregnation." After her second marriage she supposed she was pregnant, and declared that she felt the movements of the fœtus. Her symptoms proved to be due to "flatulency and fat."

The duration of gestation is thus quaintly stated :

"Prudent matrons, * * as long as they note the day of the month in which the catamenia usually appear, are rarely out of their reckoning, but after ten lunar months have elapsed, fall in labor, and reap the fruit of their womb the very day on which the catamenia would have appeared, had not impregnation taken place."

In discussing the causes of labor, he, as Willis says,

"Throws out the first hint of the true use of the lungs. Hitherto the lungs had been regarded as surrounding the heart for the purpose of ventilating the blood, and tempering or modulating its heat, the heart being viewed as the focus or hearth of the innate

heat, and Harvey himself generally uses language in harmony with these ideas; but in one instance, the lightning of genius giving him a glimpse of the truth, he says: 'Air is given neither for the cooling nor the nutrition of animals, * * * it is as if heat were rather enkindled within the fœtus (at birth) than repressed by the influence of the air.'

He regards the causes of labor as two-fold: the full development of the fœtus, and a corresponding development in the uterus, so that it is at length excited to cast out its contents. These, he thinks, are most naturally thrown off entire, "like the ripe fruit which drops from the tree without scattering its seed before the appointed time."

Harvey's observation of midwives was not unlike what is often seen in these days. He says:

"Midwives are so much to blame, especially the younger and more meddling ones, who make a marvelous pother when they hear the woman cry out with her pains and implore assistance, daubing their hands with oil, and distending the passages, so as not to appear ignorant in their art, giving, besides, medicines to excite the expulsive powers, and when they would hurry the labor, retarding it and making it unnatural, by leaving behind portions of the membranes, or even of the placenta itself, besides exposing the wretched woman to the air, wearying her out on the labor-stool, and making her, in fact, run great risks of her life."

Two classes of labor are described—natural and unnatural. The first is when both mother and fœtus "perform their proper parts [so] that a safe and genuine labor results." Unnatural labors are either premature or delayed, "when a difficult or tedious labor is the result," when dangerous symptoms result, or the powers of the mother fail, "or from sluggishness on the part of the fœtus in making its way out."

A case of unnatural labor was related which was evidently one of uræmic coma, and consequent inaction of all voluntary muscles. He attempted to excite sneezing by "a powerful sternutatory," after other efforts had proved unavailing for the purpose. This last effort to excite the sneezing had the effect to excite a convulsion, during which a living child was expelled, but the mother did not recover from the state of coma.

From what I have quoted, it is seen that he thought the fœtus took an active part in labor. To the objection that would be made in cases where the fœtus was dead, he says that the "waters, * * by their putrid and acrimonious nature, stimulate the uterus to expel its contents." So strongly is he impressed with the idea of the agency of the fœtus in bringing itself into the world, that he says:

"When we chiefly depend upon the fœtus as being lively and active to accomplish delivery, we must do our best that the head escape first; but if the business is done by the uterus, it is advisable that the feet come foremost."

I quote this as showing his readiness to perform podalic version, and

that he made efforts to alter the position in cases of mal-presentation. The case he relates to confirm his idea of the remarkable power of the child in effecting its escape is of interest, though it only shows how strong are the expulsive efforts, and that it was a remarkably favorable termination of a very unpromising case. He knew a woman who, in a difficult labor, had

"The whole length of the vagina so torn and injured that subsequently, after she had again become pregnant, not only did the parts in the neighborhood of the nymphæ, but the whole cavity of the vagina as far as the orifice of the uterus, become adherent; this went to such an extent that coition became impossible, nor could a probe be passed up, nor was there any passage left for the natural discharges." * * * During labor, "the whole space was burst through, and a vigorous infant born."

The patient ultimately recovered her health and it is intimated that she bore other children.

Yet he recognizes the action of the uterus as contributing to delivery. He had under observation a patient who was suffering from complete procidentia of the uterus. He replaced it and kept it in place for a time by the use of "pessaries and bandages." But after a time it recurred, and at length she became pregnant. The enlarged uterus "hung down as low as her knees. She aborted a foetus 'a span long.'" He says of this case:

"I have mentioned the case on this occasion to show that it was the uterus alone which excited the abortion, and expelled the foetus by its own efforts."

The physiological evolution and involution of the uterus he comments upon in a strain of poetic and reverent eloquence (pp. 540-1): He points out the importance to the women of the regular and perfect performance of the functions of the generative organs, how the health of some is established by marriage, and how "want of action on the part of the uterus exposes the body to various ills. For the uterus," he adds,

"is a most important organ, and brings the whole body to sympathize with it. No one of the least experience can be ignorant what grievous symptoms arise when the uterus either rises up or falls down, or is in any way put out of place, or is seized with spasms; how dreadful then, are the mental aberrations, the delirium, the melancholy, the paroxysms of frenzy, * * * all arising from the unnatural states of the uterus."

The boldness and thoroughness (so to speak) of his practice is shown in his management of a case of abortion, caused by fever and great prostration, and which was followed by a condition of collapse:

"Finding the uterine orifice soft and open, and the lochia very offensive, I suspected," he writes, "that something was undergoing decomposition within; whereupon I introduced the fingers and brought away a 'mole,' of the size of a goose's egg, of a hard, fleshy, and almost cartilaginous consistence, and pierced with holes, which discharged a thick and fetid matter. The woman was immediately freed from her symptoms, and in a short time recovered." (P. 545.)

He concludes his essay on Parturition by relating the case of a soldier's wife who, accompanying the army on the march, being taken in labor as it halted near a river,

"retired to a neighboring thicket, and there, without the aid of a midwife or any other preparation, gave birth to twins; after she had washed herself and them in the running stream, she wrapped the infants in a coarse covering, tied them on her back, and the same day marched barefoot twelve miles with the army, without the slightest harm ensuing.

He refers to Cæsarian section with familiarity and says:

"I have often seen the fœtus extracted alive from the uterus, when the mother had been dead some hours."

Again he says (p. 570):

"In the Cæsarian section, when the embryo is still enveloped in the chorion, I have often found the umbilical arteries pulsating, and the fœtus lively, even when the mother was dead and her limbs stiffened."

From these references I infer that he had a large obstetrical practice, either private or consulting, and that he was ready for any emergency. These references also confirm what I have previously referred to, viz.: the value of thorough anatomical training. It lies at the foundation of medical no less than of surgical practice. No man is born an anatomist. But by diligent study of the subject the physician may practice his profession with a zeal and confidence that insure success, being "bold in security, cautious in time of danger, avoiding impracticabilities."

I have already exceeded the limits I proposed for this paper. It would be of interest and value to more fully call to mind Harvey's many and valuable contributions to the subjects of obstetrics and gynæcology. We find that he was far in advance of his age. Many things that he observed and practiced afterwards fell out of mind and use, to be revived in later years, and perhaps to be vaunted as new discoveries.

"For out of the olde feldis, as men saith,
Comith all this newe corne, fro yere to yere;
And cut of old bokis, in god faith,
Comith all this newe science that men lere."

DISCUSSION.

DR. SEGUR said that he was very much obliged to Dr. Stuart for the very interesting exhibit he had made of Harvey's knowledge of the subject of obstetrics. The suggestion that Harvey had a large obstetric practice, he would add, was very probably correct, for he remembered, in reading a life of John Hunter, the statement that Harvey was very largely engaged in obstetric practice in his time. There are a number of points of interest in the paper, and he would seek an early opportunity to read Harvey's work on Parturition. There is one question suggested by the paper, and the Society would doubtless like to hear Dr. Stuart's answer.

As he understood the paper, Harvey taught that the delivery of the child was due partly to the action of the uterus and partly to the action of the child. He thought the Society would like to know what Harvey taught was the part of the child in the delivery. There was a sense, of course, in which this teaching would be accepted at the present day, and it had occurred to him that that was the sense that Harvey intimated. But he thought that a further explanation would bring out that point, because Dr. Stuart had said that Harvey, in explanation of the delivery when the foetus was dead, said that the irritating fluids or liquids then took the place of the child, and caused the uterus to act. This foreshadowed, of course, a much later doctrine, and in fact the present doctrine, of the reflex action of the uterus in parturition. What was the precise way in which the foetus was operative in delivery, according to Harvey?

DR. STUART replied that there were so many points that Harvey brings up that he could not even touch on more than a very few of them. In regard to the question raised by Dr. Segur, the Society would remember that he had said that Harvey taught that there was a preparation on the part of the mother as well as a preparation on the part of the foetus to labor. The preparation on the part of the mother was described, and in regard to the foetus, it "dove down"—the very expression used by Harvey—and really made efforts with its hands and feet to liberate itself. Harvey's language was very graphic with regard to this point—as if the foetus were struggling to get out; and the picture is of one crawling about in the uterus to find where the outlet was, and then trying to get out through it. But Harvey recognized, of course, what Dr. Segur had stated as foreshadowing the modern idea of the reflex action of the uterus. The cases quoted showed this. One part of Harvey's treatise he had not touched upon at all, that was very interesting to him—the limits of his paper had prevented it—which was, the subject of the various membranes, the foetal membranes, which those who may read Harvey will find very interesting and instructive.



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BY WILLIAM HARVEY