JAMES BLUNDELL (1790–1878)

EXPERIMENTAL PHYSIOLOGIST AND OBSTETRICIAN

by

J. H. YOUNG

JAMES BLUNDELL, who was born on 27 December 1790, was a medical man with ideas far in advance of his time. As well as being an outstanding obstetrician, he is remembered for his experiments in physiology relative to abdominal surgery and as a pioneer in the employment of blood transfusion.

His scholastic education was entrusted mainly to the Rev. Thomas Thomason, a noted classical scholar. Blundell's love of classical literature remained with him all his life, and much of his leisure time in later years was spent in studying Greek. He received his earliest medical training from his maternal uncle, John Haighton (1755–1823), with whom he resided for many years and to whom he acknowledged his indebtedness when he wrote:

> To Dr. Haighton, I owe all a man can owe, both in the way of precept and example. I had the inestimable advantage of residing with him for years. He was a man of the kindest heart, and of a very generous disposition; of moral character unspotted; of first rate physiological attainments in his day; an excellent anatomist; a cautious, safe and able physician; a man who had that regard for the sanctity of truth which made him exact in all his observations; most veracious in all his statements, and a guide that may confidently be relied upon whenever he speaks to facts. He was a little unstable, but it was only a 'hasty spark'; and how could a man up at nights worried with cough, etc., be otherwise? There was this very remarkable in his character, that, of all things, folly used to vex him; and he could not laugh at her cap and bells.

Blundell's medical education was received chiefly at the Southwark United Hospitals of St. Thomas's and Guy's, where he came under the influence of such outstanding teachers as Sir Astley Cooper and Cline. His further education was continued at the University of Edinburgh where he attended the lectures of the Duncans, Rutherford, Hamilton and Gregory, paying particular attention to botany and medical jurisprudence, two subjects which, at that time, received but scant attention in London. He graduated M.D. of Edinburgh University in 1813, the subject of his thesis being 'De sensu quo melis sentitur', in which he endeavoured to prove that the senses for music and hearing were distinct though dependent. In 1814 he returned to London to devote himself to the study of experimental physiology and midwifery, a course of action determined largely by Haighton's influence.

In 1816 he became associated with Haighton as a lecturer at Guy's Hospital. In the 1816–17 session he lectured jointly with Haighton on physiology but not until the following year did he join Haighton in lecturing on midwifery too. This arrangement was continued until Haighton's death in 1823 when Blundell took over the entire duty of physiology and midwifery lectures. In those days medical teachers were often great pluralists. He became a licentiate of the Royal

College of Physicians in 1818 and a fellow in 1838. He continued to lecture at Guy's Hospital until 1834 when he resigned following a dispute with the treasurer of the hospital. Without Blundell's knowledge or approval, a colleague, Samuel Ashwell, was appointed as joint holder of the chair of midwifery. A series of letters from Blundell and from Ashwell appeared in the *Lancet* concerning the dispute but it is difficult from the evidence to decide where the fault really lay. Statements made by one were flatly contradicted by the other. Ashwell declared that he had frequently assisted Blundell, with the latter's approval, as deputy lecturer when the occasion arose, and had carried out much of the work of the hospital in Blundell's absence. He added that as early as 1825 he had entered into negotiations with Blundell with a view to succeeding him in the chair of midwifery, 'a large pecuniary consideration being required by Dr. Blundell'. After his resignation, Blundell continued his private practice, which has been described as 'large and lucrative' until about 1847, when he retired from active duties. During his later years he never rose until about noon. He saw patients at his house during the afternoon, then dined and commenced his round of visits, often as late as 8 or 9 p.m. He always carried a number of books with him which he read by means of a light specially installed inside his carriage. His portrait shows a handsome figure with a fine head of wavy hair, an expression of inquiry, almost of doubt, in his eyes, and mouth almost feminine in the curve of the lips.

Although he was not a fellow of the Medical and Chirurgical Society, three papers by him were published in the *Transactions* of that Society for 1823 and 1824. In 1824 these were published as a small volume entitled *Researches Physiological and Pathological; instituted principally with a view to improvement of Medical and Surgical Practice.*

The first essay was written with a view to improvement of the surgery of the abdomen—at this time almost forbidden territory to surgeons. He remarked at the commencement of this essay, 'of all the branches of surgery there is none, I conceive, which in this country admits of greater improvement than the surgery of the abdomen'. By experiments on animals, he sought to show that moderate openings in the abdomen 'will not necessarily or even generally prove fatal from inflammation or otherwise'. Likewise he was able to show that removal of organs such as the uterus, spleen or ovaries or even pieces of the urinary bladder was possible. He described a number of cases of severe injury to the abdominal wall, with prolapse of organs, in two of which removal of the spleen was undertaken, the patients recovering. Nevertheless he stressed that he could not recommend 'any operation as yet untried or of rare performance unless indeed in those cases in which they secure the only remaining chance of life'. He drew the attention of the profession to operations which he thought feasible:

1. Division of the fallopian tubes or removal of a small piece of them to ensure sterility particularly in cases of contracted pelvis of such a degree that the birth of a live child *per vias naturalis* was impossible.
2. Removal of both ovaries for severe dysmenorrhoea or in menorrhagia where hysterectomy was declined by the patient.

3. Removal of ovarian cysts in schirrus. He added here 'if British surgeons will not patronise and perform it, then French and American surgeons will'.
4. Removal of a large piece of the cyst in ovarian dropsy if the sac itself could not be extirpated.
5. Removal of the cancerous uterus either through the abdominal wall or *per vaginam*. Early operation, he insisted, held out the only hope of cure.
6. Removal of the puerperal uterus following Caesarean section or after rupture of that organ during labour.

He enlarged on this point later when he wrote:

> In speculative moments I have sometimes felt inclined to persuade myself the danger of Caesarean section might, perhaps, be considerably diminished by the total removal of the uterus. . . . If the Caesarean operation be performed on the rabbit in the ordinary way, unless I am much mistaken, it will be found that the animal generally perishes in consequence.

He performed the operation in four rabbits, removing the uterus and bringing out the stump to make close contact with the abdominal incision and sutured it there. Three of the rabbits recovered. He went on:

> In performing the Caesarean operation in the human body, perhaps this method of operating may hereafter prove an eminent and valuable improvement. Beware, however, of temerity—see what may be done in the dead body—gather facts—form inferences—write little—meditate much. Perhaps you may do something for obstetric surgery here. Let it be remembered, that in securing the vagina and removing the uterus, we are substituting a wound, well secured and of smaller extent, for one that is not secured by ligature at all.

Blundell himself never performed this operation, but at an advanced age he was able to see his suggestions carried out by Porro in 1876. A mutilating operation it certainly was, but at least it reduced greatly the mortality from Caesarean section.

7. To open the abdomen and repair a rupture of the bladder.
8. To ligature a vesico-vaginal fistula.
9. To operate and reduce the bowel in cases of intussusception.

Time proved that Blundell was correct in his opinions. With the advent of anaesthesia and later the antiseptic régime, great strides were made in abdominal surgery.

Blundell's second essay was entitled 'Experiments in a few controverted points respecting the Physiology of Generation'. In it he proved that 'the semen must have access to the rudiments' for reproduction to occur, a point hitherto in dispute among physiologists. He showed that a corpus luteum developed in the absence of pregnancy and that its presence was not, as hitherto supposed, necessarily evidence of female impregnation as it had been found in patients in whom conception could not possibly have occurred.

The problem of blood transfusion was the subject of the third essay. It is reasonable to assume that from earliest times physicians must have pondered this problem—whether the giving of blood from a healthy individual to a sick one might not cure the disease. Pope Innocent VIII is said to have been given

blood from three youths but patient and donors all succumbed. In 1615 the operation was foreshadowed by Libavius:

> Let there be a robust youth, healthy and full of vigorous blood; let there stand by him one exhausted of strength, thin, lean and scarce drawing breath; let the master of the art have silver tubes fitting into one another; let him open an artery of the robust person, insert one tube and secure it; let him immediately open an artery of the sick man and insert the other tube; then let him fit the two tubes together and let the blood of the healthy person leap, hot and vigorous, into the sick man and bring the fountain of life and drive away all weakness.

A trace of ridicule seems to run through such a statement. He could have no idea how near he was to giving an accurate description of an operation performed fifty years later. In 1616 Harvey discovered the circulation of the blood and, as a result, surgeons became supplied with knowledge necessary to undertake the transfusion of blood.

Numerous communications on the subject appeared in the *Philosophical Transactions of the Royal Society* from 1665 to 1667.

In 1665 Richard Lower and Edmund King of Cornwall carried out the first blood transfusion from one animal to another. On 12 June 1667 Jean Baptiste Denis, professor of surgery at Paris and surgeon to Louis XIV, transfused 6 ounces of calf blood into the veins of a madman after venesection of 10 ounces. The treatment was repeated a few days later, 10 ounces being given on this occasion. Improvement was but temporary and although the patient's wife suggested a third transfusion, this was not carried out. The patient died and, apparently from motives of revenge, his widow brought a civil action against Denis. Further experiments were forbidden by the magistrates of Paris, but in the following years transfusions were made by Mayor and Purmann in Germany, by Riva and Manfredi in Italy and Van Horne in Holland. Complications, at that time inexplicable and often fatal, occurred. After a few years, blood transfusion disappeared from the scene, no more being heard of it until Blundell began his experiments.

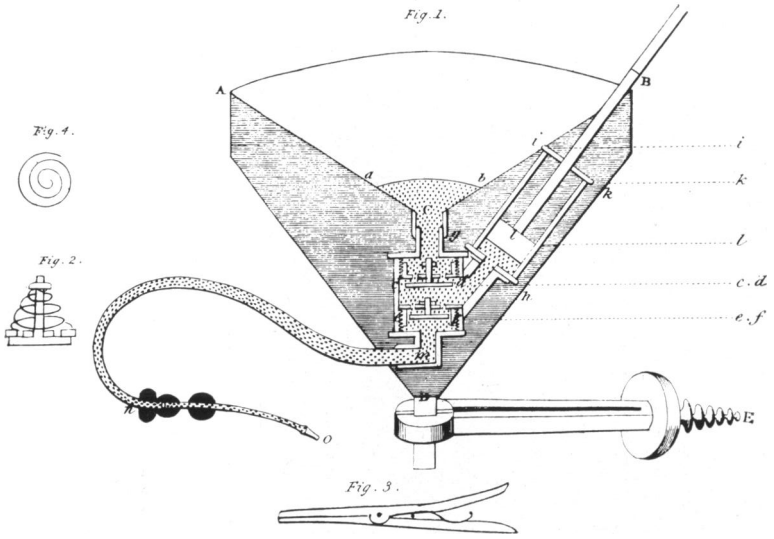
Blundell started his researches on dogs, bleeding them almost to death and then trying to revive them by means of blood transfusion. He was not at first successful, due to the time-lag between collapse of the animal and the giving of fresh blood. He employed arterial blood obtained from other dogs, and found that if blood was given within a few minutes of collapse the animal recovered. He then tried the effects of transfusing human blood into dogs which he had previously bled. These all died, due, he believed, to the blood being unsuitable.

From his experiments he concluded that

> the blood of one sort of animal could not with impunity be substituted in large quantities for that of another sort of animal. It is clear from these facts and inferences that although the blood of mammalia may be essentially the same in all genera, the different kinds of blood differ very importantly from each other. This is an interesting and perhaps difficult enquiry, whether any genus of animal be furnished with a kind of blood congenial to the human veins. That of the horse is most promising.

In practice he thought blood ought to be transfused by a tubule direct from the radial artery of the donor into the vein of the recipient, but was also able to

James Blundell
(From T. S. Pettigrew's *Memoirs of some of the Celebrated Physicians and Surgeons*, London, 1840.)



Blundell's Impellor. Fig. 1. Perpendicular section of the Impellor. A.C.B. The inner cup. A.D.B. The outer cup full of water. D.E. The vice. *a.b.* A line on the inner cup above which the blood should not be suffered to rise. *c.d.* The upper valve, armed with *two* or *three* folds of soft alum leather. *e.f.* The under valve, *idem. g.h.i.k.* The syringe. *l.* The plug. *B.* A mark on the piston-rod indicating the elevation to which the plug *l.* has been raised. The space covered with dots represents that portion of the instrument which is filled with blood. The space covered with lines represents that portion of the instrument which is full of water. *m.n.* The flexible tube. *n.o.* The venous tubule. When the piston of the syringe is raised, the blood is drawn from the cup A.C.B. down pipe C. through the upper valve *c.d.* into the syringe; and reflux from that part of the instrument which lies below the under valve *e.f.* is prevented by the closure of the valve. When the piston is depressed, the blood is expelled through the valve *e.f.* along the pipes *m.n.o.*; and reflux into the cup A.C.B. is prevented by the closure of the valve *c.d.* Except the plug joint at *n.* all the joints at which air might enter and mix with the blood, are covered with water, by which means the instrument is rendered air-secure. With a view of avoiding complexity, the springs which raise the valves are not represented. Fig. 4. The curve of the wire forming the spring which raises the valves. Fig. 2. The valve with the springs mounted. Fig. 3. Spring forceps.

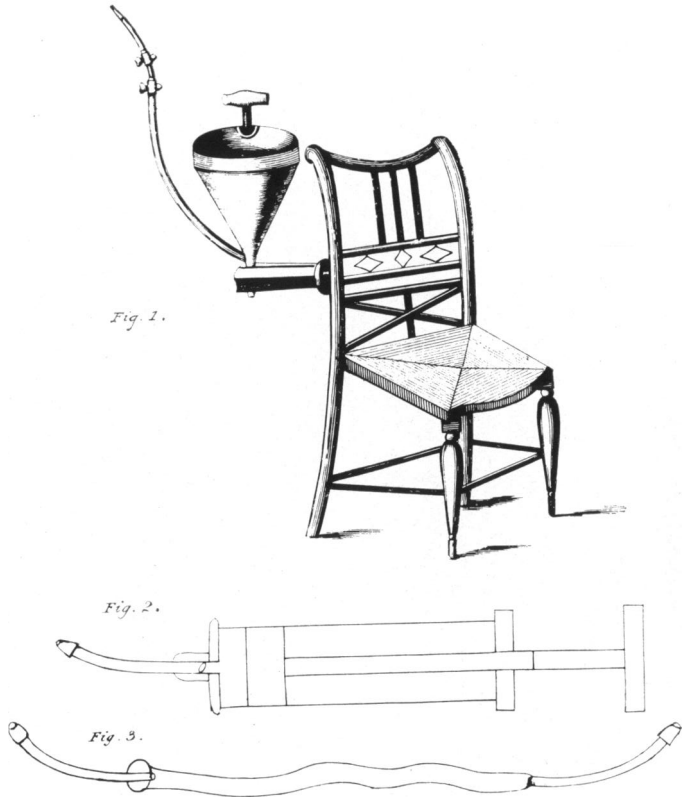


Fig. 1 Showing how impellor used

Fig. 2 Syringe for use in blood transfusion

Fig. 3 Tubules used for 'direct transfusion'

(From Blundell's *Researches Physiological and Pathological*, 1824.)

show that blood drawn off, allowed to remain in a container for only a few seconds and then injected by a syringe, was satisfactory. If direct transfusion was impossible he suggested injecting the blood by means of an 'impellor', an instrument in which blood was collected in a metal cup and injected into the vein of the recipient with the aid of a syringe attached. (Thomas Radford of Manchester owned an impellor which, he stated, he later presented to the museum of St. Mary's Hospital, but it seems to have been lost.)

The third method, which Blundell found preferable, was to collect the blood from the donor in a syringe of 2–3 ounces capacity and inject it immediately into the veins of the recipient. Any air which might by accident be injected he considered of no danger if only small in quantity. All these suggestions referred only to the employment of human blood. He did not at any time inject animal blood into humans.

He described six patients treated by blood transfusion, two of post-partum haemorrhage and one each of puerperal fever, cancer of the pylorus, ruptured aneurysm and hydrophobia. In no case was there any beneficial result. From his experience, however, he concluded that transfusion by the syringe might be performed with safety and without dangerous symptoms provided the blood be 'promptly' transmitted and air excluded from the instrument. He thought that better results might perhaps be obtained by the injection of blood into arteries rather than into the veins. He ended his essay by saying 'the operation will, after undergoing the usual ordeal of neglect, opposition and ridicule, hereafter be admitted into general practice; whether mankind are to receive the benefit of it, in this or any future ages, from British surgery, or that of foreign countries, time, the discoverer of truth or falsehood, must determine'.

Later Blundell was able to report two cases of post-partum haemorrhage successfully treated by blood transfusion. In the first of these blood was given six hours after delivery when 6 ounces were given and repeated two hours later. In the second case a total of 8 ounces was given over a period of three hours.

Although Blundell's suggestions were enthusiastically received by a few such as Walker and Doubleday, they were not generally adopted. C. H. F. Routh in 1849 was able to collect only forty-four 'recent' cases of which twenty-four were of puerperal haemorrhage. Of these nineteen recovered. Of the five fatalities, he considered two were already dead when transfusion was commenced, one had air embolism and one, he believed, was not given sufficient blood. In 1852 John Soden was able to collect thirty-six cases of puerperal haemorrhage treated by blood transfusion with twenty-nine recoveries. Fourteen of these received 5 ounces or less of blood; nine, amounts ranging from 6 to 10 ounces; and the remainder 12 to 24 ounces. In spite of these successes, surgeons generally did not view the operation with favour, a fact perhaps not surprising in view of modern knowledge. The discovery of the different blood groups (1900) and the employment of anti-coagulants (1914) gave impetus to the employment of blood transfusion, but its frequent modern use is a comparatively recent development.

Blundell's lectures in physiology appeared in the *Lancet*. In his introductory lecture he stressed to his students the necessity of original thought, saying:

Think for yourselves . . . do not let my opinion or the opinion of my distinguished colleagues have more weight with you than truth and nature entitle them to. In religion faith is essential; in physiology, a philosophical scepticism. . . . But gentlemen, it is not enough to think for yourselves and that you even get together your facts; from these facts principles must be deduced, if you aspire to the merit of enlarging the sphere of physiological knowledge.

He was an uncompromising advocate of liberty in physiological experimentations and had no patience with those who opposed this doctrine. Regarding experiments on living animals for investigation of physiological truths, he said:

Those who object to the putting to death of animals for a scientific purpose, do not reflect that the death of an animal is a very different thing from that of a man. To an animal death is an eternal sleep: to a man it is the commencement of a new and untried existence. . . . Is not pain daily and hourly inflicted upon the inferior animals to contribute to the support and pleasure of man; and shall it be particularly objected to when inflicted for the purpose of advancing physiological and medical knowledge? Shall it be said that the objects of physiological science are not worth the sacrifice of a few animals? Men are constantly forming the most erroneous estimates of the comparative importance of objects in the world. What influence I ask has the battle of Actium now in the destiny of mankind? What will the battle of Trafalgar have a few thousand years hence? . . . But mankind will always be equally interested in the great truths deducible from science. . . . Here then we take our stand: and we defy the penny drivellers of the press, the declamatory and spurious orators of the day, to drive us from it. We defend the sacrifice of animals in so far as it is calculated to contribute to the improvement of science: we maintain that such a sacrifice is not only justifiable but a sacred duty.

At the close of each physiological course, Blundell was in the habit of exhibiting in the classroom a list of the more interesting problems relative to animal economy which had furnished subjects for investigation. Pettigrew gives a list of these which illustrates the very wide field covered by Blundell in his experiments. In addition to those already described, there are the results of experiments on chylification, on coagulation of the blood, adult and foetal, on the sensibility of the foetus *in utero*, on the muscular action of the heart, and on the results of strychnine poisoning.

Blundell's lectures on midwifery appeared verbatim in the *Lancet*, 1827–8–9. They were surreptitiously taken by a shorthand writer in the service of Thomas Wakley, proprietor and editor of that journal. Blundell tried to prevent this step, but was unsuccessful in restraining the continuance of this practice and the lectures were successively taken and published in open defiance of their author.

In 1832 the lectures were published in a volume entitled *Lectures in Midwifery and the Diseases of Women and Children as delivered at Guy's Hospital*. This was followed in 1834 by a larger volume, *The Principles and Practice of Obstetricy as at present taught by Dr. James Blundell*, edited by Thomas Castle of Trinity College, Cambridge, and published in London. An American edition was published in Washington in the same year. The books were founded in most part on lectures delivered by Blundell at Guy's Hospital during 1830–1, rearranged and revised on the author's advice. The work was well reviewed, one reviewer describing it as 'a mine of gold—a treasury of literature, science and practical knowledge for the student, which it would be suicidal madness in him to neglect or fail to have constantly in his possession for reference'. To a criticism that conservatism was

carried to excess, the editor replied that, 'if to any person mature in obstetrics, the principles of recession should appear to be carried too far, they are requested to recollect that it is not to them but to those who are incipient in practice that the lectures were originally addressed'—his remarks were intended for undergraduates and not for practitioners of wide experience.

An opening section on anatomy and physiology is followed by one on the signs of, progress in, and diseases of pregnancy. For mild cases of oedema, he advocates rest, purging and support to the lower limbs, adding that 'patience, time and delivery will be of service'. For severe cases venesection up to 50 ounces is recommended; if this fails to give relief, termination of pregnancy by artificial rupture of the membranes should be considered. In the treatment of syphilis in pregnancy, mercury given not earlier than the thirty-fourth week was, in his view, the best way of protecting the foetus.

Labour he divided into five classes:

(1) normal—completed in 24 hours, the head presenting;
(2) preternatural—some other part presenting;
(3) flooding cases;
(4) laborious—where instruments required;
(5) complicated—some extraordinary symptom present.

Stressing that the accoucheur should see his patient early in labour, he goes on to give some interesting and useful advice. Only if there is reason to expect difficulty should instruments be taken—'Lead yourselves not into temptation . . . if you put them in your pocket, they are apt to slip out of your pocket into the uterus.' He advised that only opium, a catheter, a lancet and a tracheal pipe need be taken at the first visit. On arriving at the house, it is better at first to retire to some adjoining room

> where he may see the lady patroness the nurse, who has generally a great many foolish things to say, all of which he may as well bear with patience and *bon hommie*, two useful obstetric instruments, which may be fearlessly carried at every labour. . . . When the shower of words is blown over . . . you may make inquiries respecting the progress of the labour, the condition of the bladder, the state of the bowels, and so on. . . . Should you chance not be a weak head, a dear man, a pious man, a good kind creature, or still worse, should the lady be pettish, and declare you are a brute or a physiologist, so that for these manifold offences, she never, never will—never can see you—you may remain in the house, as the female 'never', in these cases, comprises but a small portion of eternity, perhaps in an average some one or two hours, and when the caprices and antipathies are a little subdued by the pains your presence will be cordially welcome.

Blundell had a great horror of meddlesome midwifery and his lectures abound with the proof of the extreme caution with which he conducted his obstetric practice. Again and again in his remarks he pours forth obstetrical aphorisms, many of which could be repeated to modern students, particularly in regard to operative midwifery.

His advice on how to deal with all types of haemorrhage or 'flooding, the precursors of dissolution', as he calls them, is a joy to read. In the moribund patient, 'if instead of raising a senseless clamour against experiments and experimentors, we had only availed ourselves of the help of physiology: if we

had only supplied the necessary blood: if we had only transfused [and how easily it might have been done!] at worst she could have died'. He warned against the danger of venesection in patients after a haemorrhage and against the danger of any manual interference once bleeding had ceased. Emphasizing again the value of blood transfusion, he said 'don't subject yourselves to the painful mortification of seeing your patients perish at the entrance to the port'.

He differentiated clearly between placenta praevia and accidental haemorrhage. The former he treated by version or rupture of the membranes, depending on conditions present—the state of the patient, the laxity of the soft tissues. For accidental haemorrhage he favoured rupture of the membranes which he called a beautiful operation. In both conditions he warned against the 'silly rule' advocated by some—to undertake no treatment unless the uterus was active. 'To die is no jest, nor is it a jest to die even by the kick of an ass.'

He advised no interference in breech presentation, in the absence of clear necessity—until the buttocks reached the pelvic outlet but emphasized the need to watch the pulsations in the umbilical cord. 'Hurry is inadvisable—as cautious haste is proper.' In the early stages of labour 'put your hands in your pockets, not in the vagina'. He went on:

> By the people of England, wild beasts are caged, but worse than them, the accoucheur meddlesome and violent, yet responsible to none, has been let loose upon society, with all his instruments of destruction around him. . . . Like the two Amphytrios in the comedy, mis-fortune and mis-management are so like each other, that their nearest acquaintance cannot always distinguish the one from the other. . . . Steel, however, like the nerves of a rude accoucheur, is apathetic and has no sympathy.

He gives careful instruction about the delivery of the after-coming head, emphasizing that the head should enter the pelvic brim with its largest diameter in the transverse diameter of the inlet. Many difficulties could be surmounted, he declared, if this elementary fact was remembered.

In transverse lies of the foetus he did not consider Caesarean section justifiable. If version was impossible, decapitation was preferable to embryotomy. The doctrine of Denman regarding spontaneous evolution he believed to be dangerous. In performing version 'have mercy upon the patient; again I say have mercy upon her'. In face presentations, time and nature would deliver most; in persistent *occipito posterior* positions he advised manual rotation of the head, followed if necessary by employment of the forceps, craniotomy only if all else failed.

Before employing forceps, he emphasized the necessity of ascertaining the exact position of the foetal head prior to their application and recommended a preliminary venesection of 14–16 ounces. Blundell himself preferred straight forceps, both short and long. He prepared his directions concerning their use by saying:

> I do not like to see an elegant pair of forceps. Let the instrument look like what it is, a formidable weapon. *Arte non vi*, may be usefully engraved in one blade, *cave perineo* in the other. If we were to take the aggregate of all the evil and all the good which results from these instruments I do believe it would be found that the total has considerably exceeded the advantage derived from artificial assistance.

He strongly deprecated the use of forceps (or the lever) to save time, but thought 'a sort of amnesty' might be extended to a man who was very dexterous in the use of them; and he admitted that when called to 'very lingering cases, when friends were anxious, the practitioner worn out and harassed and the patient herself importunately desirous that instruments might be used, he had in some instances had recourse to forceps and delivered the woman with safety'. 'Nevertheless,' he added, 'I consider myself culpable for so doing.' It is but right to add that, at the time these words were spoken, British obstetricians, at least the majority, favoured an extremely conservative policy which on occasion brought disaster in its wake, as witness the tragedy of Princess Charlotte.

Like his colleagues, he preferred craniotomy to Caesarean section and delivered *per vaginam* wherever possible. A perforator must be strong and thick: 'a roughness of appearance well becomes the austere duties which it is destined to discharge'. He tells us that he only employed this instrument with the greatest reluctance, pointing out that an 'overpowering and pre-emptory necessity for it' must be clearly established for 'before the tribunal of reason this alone can clear the operation from partaking of the nature of murder'.

He had no patience with his continental colleagues who imagined that a child must be baptized at all costs and invented instruments for the purpose whereby baptism could, if necessary, be undertaken before delivery. He said:

> Moreover, should our planet meanwhile escape some of its former catastrophes, posterity will, probably, learn with surprise, some thousand years hence, what have been the opinions relating to these points, maintained by their predecessors. They may learn with surprise, not unmingled with discreet levity, that a large and religious body of their civilized forefathers had been of an opinion, not to be presumptuously touched, that if one of the children of our Great Parent were permitted to perish in utero, without the administration of water and words, in consequence of an original and unexpiated moral taint, derived from our common ancestor, eternal perdition would very probably be its portion. Happily, however, as we are in another and better system of opinions, we are not at all surprised to hear that by many such a notion has been deemed both wholesome and tenable.

Contracted pelvis he divided into slight, moderate and severe degrees. The first mentioned, he said, often delivered without interference or with the aid of forceps. The others had to be treated on their merits. He favoured induction of labour—that particularly British procedure—in selected cases from the thirty-fourth week of pregnancy. In cases where delivery was impossible except by Caesarean section, he suggested early termination of the pregnancy by opening the abdomen and passing a trocar into the uterus. As already mentioned, sterilization was also advocated in such cases.

Eclampsia he treated by copious venesection, emetics and purges. Only if these measures failed to control the fits did he recommend obstetric interference —usually rupturing the membranes. Ergot he believed useful at times but warned against using it in cases of malpresentation and contracted pelvis.

For puerperal fever he advocated venesection and thought calomel, opium and turpentine of doubtful utility. He described a type of this dreaded malady which he called hydrosis or hydrotic fever which was probably septicaemia.

He warned about the danger of sudden death in phlegmasia dolens, although

not recognizing that this could be due to pulmonary embolism. 'Ligaturing' of ruptures of the perineum did not find favour. A short section on the surgical and medicinal diseases of infants concludes the volume.

In 1842 the *Lectures on the Principles and Practice of Midwifery*, edited by Charles Severn, was published in Philadelphia. German and Italian editions of Blundell's lectures were popular.

The final volume of Blundell's obstetric works calling for notice is *The Principles and Practice of Obstetric Medicine*, edited by Alexander Cooper Lee and Nathaniel Rogers, published in London in 1840. This is much longer than any of his other works and is dedicated, by the publisher, Joseph Butler of Southwark, to Arthur, Duke of Wellington, 'The Hero of a Hundred Fights'. Gynaecology as well as obstetrics is included and much new matter added from other writers, but the 'Principles' so well advocated by Blundell remained. An American edition of this work was published in Philadelphia in 1842.

The year 1837 saw the publication of a companion volume to that in obstetrics, *Observations on some of the more important Diseases of Women*, again under the editorship of Thomas Castle.

Nearly one-third of the book is taken up in a discussion of displacements of the uterus and affections of the bladder, diseases which, no doubt, formed a large part of current gynaecological practice, a fact not surprising when the difficult confinements experienced by so many women are borne in mind. For the different types and degrees of prolapse, pessaries of various sorts were recommended, together with astringent vaginal douches. The differential diagnosis of bladder affections is considered at length. The difficult problem of vesico-vaginal fistula exercised Blundell's ingenuity. Treatment considered included the indwelling catheter, cauterization, the use of ligatures and a method recommended by Barnes—plugging the opening in the vagina with a ball pessary covered with a fine soft sponge.

For schirrus tumours of the uterus and of the ovary, he considered that treatment could be but palliative. He did not think surgery had anything to offer. For ovarian 'dropsy' (cystic tumours), tapping was recommended, but to be deferred as long as possible. His suggestion of operative treatment of such cases has already been mentioned. Uterine polypi, whatever the size, he removed by ligature. Leucorrhoea, of which he recognized two forms, 'inflammatory' and 'gleety', was to be treated by astringent douches eight to ten times daily and of gradually increasing strength.

For cancer of the uterus Blundell advised hysterectomy in selected cases—those in which the disease was of recent standing in which there was no evidence of widespread metastases, and those in which he considered the patient fit to withstand the operation. He performed the operation on four occasions. Three did not survive more than a few hours but the fourth lived for several months. He expressed the view that perhaps the vaginal route might be found the best method of operative approach. He well appreciated the risks attached to the operation, but added: 'If we are not justified in risking something—where risk is absolutely necessary—as in cases otherwise without hope, pray in what cases are we justified?' He quoted Ritzius of Sweden who reported five cases of

vaginal hysterectomy for cancer of the uterus, four of whom were reported well some months later.

The last part of the book deals with disorders of menstruation and diseases of the vulva. For dysmenorrhoea, he believed massage the only certain cure. Menorrhagia he treated by intra-uterine douches of alum while for amenorrhoea he recommended douching the upper part of the vagina with dilute solutions of ammonia and attention to general health. An American edition of this book was published in Philadelphia in 1840.

After his retirement in 1847 he moved to a large house in Piccadilly, where he lived in comparative obscurity, known only to his own generation, until his death on 15 January 1878.

BIBLIOGRAPHY

ASHWELL, S., *A Practical Treatise in Parturition*, London, 1828.

—— The midwifery chair of Guy's Hospital, *Lancet*, 1834–5, **i**, 18.

—— Dr. Ashwell's reply to Dr. Blundell's second letter, *Lancet*, 1834–5, **i**, 258.

BLUNDELL, J., Medical Society of London, *Lancet*, 1825–6, **9**, 295.

—— On the caesarean incisions, *Lancet*, 1827–8, **ii**, 167.

—— Successful case of transfusion, *Lancet*, 1828–9, **i**, 431.

—— Dr. Blundell's reason for his retirement from the Medical School of Guy's Hospital, *Lancet*, 1834–5, **i**, 28.

—— Dr. Blundell's second letter to his medical friends, *Lancet*, 1834–5, **i**, 207.

—— Dr. Blundell's third letter to his medical friends, *Lancet*, 1834–5, **i**, 418.

—— Experiments in the transfusion of blood by the syringe, *Med. Chir. Trans.*, 1818, **9**, 56.

—— Some account of a case of obstinate vomiting in which an attempt was made to prolong life by the injection of blood into the veins, etc., *Med. Chir. Trans.*, 1819, **10**, 296.

—— Obituary Notice, *Lancet*, 1878, **i**, 255; *Brit. med. J.*, 1878, **i**, 351; *Med. Times and Gazette*, 1878, **i**, 156.

DOUBLEDAY, M., Another case of successful transfusion, *Lancet*, 1825–6, **9**, 112.

LIBAVIUS, A., *Appendix necessaria synagmatis arcanorum chymicorum*, Frankfort, 1615, quoted by J. Round, *Transfusion of Human Blood*, trans. by C. H. C. E. Inness. London, J. & A. Churchill, 1877.

PETTIGREW, T. S., *Biographical memoirs of the most celebrated physicians and surgeons*, London, 1840.

RADFORD, T., MS notes on James Blundell. Manchester Medical Society, 1878.

ROUTH, C. F. H., Remarks statistical and general on the transfusion of blood, *Med. Times*, 1849, **20**, 114.

SODEN, J., A case of haemorrhage from inversion of the uterus in which the operation of transfusion was successfully performed, *Med. Chir. Trans.*, 1852, **35**, 413.

UNWINS, M., Medical Society of London, *Lancet*, 1825–6, **9**, 295.

WALLER, M., Successful transfusion, *Lancet*, 1826–7, **11**, 457.