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### Abstract

Among the many things in which the Scots nation can take pride our contribution to medical science has been of a very high order. This perhaps reached its acme in the 18th and 19th centuries when Scotland in general and Edinburgh in particular represented the magnet for medical trainees from across the globe. The catalogue of Scottish contributions to developments in medicine is enormous but perhaps in no branch of medicine is it greater than in obstetrics. It could be reasonably claimed that in compiling a list of those obstetricians from the British Isles who have made the most telling contributions to the advancement of this clinical discipline the first half dozen names would probably be Scots. This short article will highlight some of the famous obstetricians who have helped to bring the art and science of obstetrics out of the mists of obscurity to the highly developed clinical science of today.

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# The Scottish Contribution to the Development of Obstetrics

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Among the many things in which the Scots nation can take pride our contribution to medical science has been of a very high order. This perhaps reached its acme in the 18<sup>th</sup> and 19<sup>th</sup> centuries when Scotland in general and Edinburgh in particular represented the magnet for medical trainees from across the globe. The catalogue of Scottish contributions to developments in medicine is enormous but perhaps in no branch of medicine is it greater than in obstetrics. It could be reasonably claimed that in compiling a list of those obstetricians from the British Isles who have made the most telling contributions to the advancement of this clinical discipline the first half dozen names would probably be Scots. This short article will highlight some of the famous obstetricians who have helped to bring the art and science of obstetrics out of the mists of obscurity to the highly developed clinical science of today.

Some of the figures referred to here are household names and achieved lasting fame. Others made telling observations which perhaps did not gain the recognition they deserved. Perhaps the most significant of these was Alexander Gordon of Aberdeen. He was born in 1752 and died tragically young in 1799 but four years before his death he published a monumental treatise on the epidemic nature of puerperal fever, also known as childbed fever. This disease in which the causative organism was much later identified as the beta-haemolytic streptococcus was the scourge of childbirth carrying a frightful burden of maternal mortality in the 18<sup>th</sup> and 19<sup>th</sup> centuries and it was well into the 20<sup>th</sup> Century before the frightful spectre of this killing disease receded. The name most widely acknowledged as having identified the source of the problem was Ignaz Semmelweis a Hungarian who pursued his clinical career in Austria. He made observations concerning the transmission of puerperal sepsis by examining medical staff in 1847 more than 50 years after Gordon had made similar observations. Like Gordon his observations received little attention from colleagues and indeed were the subject of ridicule to the point that Semmelweis' career, and indeed his health, was permanently ruined. It is the latter's name which survives in connection with this disease. Gordon's observation however should not be underestimated and the failure of it to impact on clinical practice is a reflection of both the profession at large and the limited means of medical education and communication in his time.



Figure 1. (left): Smellie's wooden forceps (the "English lock" has become a standard part of obstetric forceps.)



Figure 2. (right): An illustration of a twin pregnancy in utero from Smellie's anatomical atlas (1756).



Figure 3. The scene in No. 52 Queen Street when Simpson and his colleagues discovered the anaesthetic properties of chloroform (1817).

If Alexander Gordon is the unsung hero of Scottish obstetrics, a man born 100 years before Gordon published his treatise was perhaps the most influential and recognised for his monumental contributions to the understanding of the childbirth process. Dr William Smellie was born in Lanark in 1697. After a medical apprenticeship and a spell as a country physician in Lanarkshire he travelled to London and subsequently to Paris to study midwifery and became the great man midwife of his generation. His most fundamental contribution was his "Treatise on the Theory and Practice of Midwifery" in which he used his enormous experience, particularly among the poor people of London, to describe for the first time the complicated processes which accompany the journey of the fetus through the birth canal. It may be hard to appreciate nowadays just how important these observations were coming at a time when the level of ignorance was spectacular. But only by understanding the complicated contortions required of the fetus as it twists and turns through the limited space available in the birth canal is it possible to give appropriate care to women in labour. Smellie used this knowledge not only to instruct other practitioners but also to provide the basis for instrumental deliveries, especially with forceps (Figure 1). He is remembered for the invention of what came to be known as the "English Lock" for the forceps and one of the treasures in the possession of the Department of Obstetrics and Gynaecology in Edinburgh is a pair of wooden forceps which Smellie employed to conduct deliveries under the bed clothes without the knowledge of the patient whom he feared would be alarmed by the noise of metal instruments. Smellie's other enormous contribution to the medical literature was his set of Anatomical Tables published two years after his treatise which contained 26 spectacular drawings by the Dutch artist van Rymdyck (Figure 2) but also 13 illustrations which were probably prepared by Smellie himself. It is clear that Smellie was not only an outstanding practitioner (gaining a reputation which led to his accolade as "the Master of British Midwifery") but also a not inconsiderable artist as seen from his portrait which hangs in the Royal College of Surgeons of Edinburgh and which is believed to be a self-portrait.

Born only a few miles from Smellie's birthplace some 21 years later was William Hunter, the eldest child of a large family in East Kilbride (his youngest brother being John Hunter who is regarded as the founder of the Royal College of Surgeons of England). William studied humanity and Greek, logic and natural philosophy at Glasgow University from the age of 14 but four years later was apprenticed to the famous William Cullen



Figure 4. The three rachitic dwarfs (1888).

who advised that he should study at Edinburgh University where he attended anatomy lectures before two years later travelling to London to work with William Smellie. In contrast to Smellie's practice amongst the poor of London Hunter became the Surgeon Accoucheur at the Middlesex Hospital and cultivated a practice among the rich and famous. The most notable of these was Queen Charlotte whom Hunter attended in several of her many pregnancies. He also published a famous work which gave wonderful insights into the circumstances of human pregnancy. His atlas of the human gravid uterus published in 1774 was also prepared with the help of Jan van Rymdsdyk. The original chalk drawings prepared from Hunter's dissections of women who died in various stages of pregnancy are now in the possession of the Hunterian Gallery at the University of Glasgow and they are works of the most surpassing beauty.

In the early years of 19<sup>th</sup> century a child was born to another large Scottish family, this time that of the baker in Bathgate. James Simpson was the seventh son born to that family and from an early age was identified as a child of exceptional intelligence and potential. He had obtained his medical degree at the University of Edinburgh at the age of 19 but was too young to be allowed to practice so he spent the interim in profitable study. He was elected to the Chair of Midwifery and Diseases of Women in Edinburgh University at the age of 28 and had a glittering clinical career. Although he made significant contributions to the development of obstetric forceps and was perhaps the first to explore the possibility of developing a vacuum extractor for obstetric delivery he is best remembered for his discovery of the anaesthetic and analgesic effects of chloroform (Figure 3). This culminated a search for agents to relieve the suffering of women in labour, an activity which brought down on him the condemnation of the establishment. Not only did his medical colleagues fail to recognise the importance of his work but he was condemned by the clergy who accused him of "seeking to rob God of the cries of anguish and the pleas for forgiveness which sinful women require to express during childbirth". Simpson was undoubtedly the most notable medical figure of his generation and his funeral in Edinburgh in 1870 was the largest the capital of Scotland has ever seen. His portraits and busts are to be found in the Edinburgh colleges and his statue is to be found in Princess Street Gardens but he is perhaps best commemorated in the Simpson Centre for Reproductive Health in the Royal Infirmary of Edinburgh.

Simpson's work on anaesthesia and analgesia together with Lister's discovery of the principles of antiseptic surgery allowed obstetricians for the first time to countenance the possibility of Caesarean delivery. This operation had been attempted since the mists of antiquity but invariably carried a very high mortality rate. Murdoch Cameron in 1888 was working in slum ridden Glasgow where poor living conditions coupled with the absence of sunlight caused by domestic and industrial atmospheric pollution had led to an epidemic of skeletal rickets. He employed classical caesarean section as an elective procedure in the delivery of a series of rachitic dwarfs who would otherwise have inevitably died from obstructed labour (Figure 4). This was recognised around the world as the first organised application of this obstetric operation. Cameron was Regius Professor of Midwifery in University of Glasgow and was followed in that position by John Martin Munro Kerr who, recognising the morbidity associated with the classical procedure, introduced the lower segment operation which we use to this day and which in many parts of the world became known as Kerr's operation.

In this short history of the Scottish contribution to obstetrics two giants of the 20<sup>th</sup> century remain to be described. They were men who were in many ways rivals and had very different philosophies but each in his own way contributed enormously to the advancement of obstetrics. Sir Dugald Baird who had been first assistant to Professor Munro Kerr in Glasgow was Regius Professor of Midwifery in University of Aberdeen. He focussed his attention on the influence of social conditions on obstetric outcome. Building on the work which Kerr had pioneered studying influences on maternal mortality he expanded that audit process to embrace perinatal mortality. He recognised the importance of family planning and indeed was a leading figure in the movement to legalise abortion. Although this was a controversial campaign it rid the country of the scourge of criminal abortion which was associated with such an appalling death toll. Shortly after his retirement in 1965 Baird published a famous monograph entitled "The Fifth Freedom" which championed the need for women to be freed from the tyranny of excessive fertility. There are many parallels between the opposition which Simpson met in his quest for relief of pain in childbirth and the ordure which was heaped on Baird in his quest that women should only bear children which they wanted and were able to care for appropriately. The passage of time has shown that society has recognised the importance of both these developments.

Ian Donald was a contemporary of Dugald Baird. Born in 1910, the son of Paisley doctor, he had his early education in Edinburgh and then in South Africa where he graduated in Arts in Cape Town before studying medicine at St Thomas's Medical School in London. He was appointed Regius Professor of Midwifery in the University of Glasgow in 1954 and spent his clinical career seeking innovations in both obstetrics and gynaecology. His monumental contribution was his development of ultrasound as diagnostic science (Figure 5). He had seen sonar (sound, navigation and ranging) used during his wartime service in the Air Squadron of Coastal Command whose task was to seek out and destroy German U-boats and he had subsequently used the same modality as an echo sounder whilst sailing his yacht. One day in 1955 he and some of his colleagues set out to drive to Renfrew to the firm of Babcock and Wilcox, an industrial firm which used ultrasound to detect flaws in welding. Donald took with him in the boot of his car a variety of ovarian cysts and tumours including uterine fibroids. One of the apprentices in the firm was sent out to buy a pound of fillet steak which was also used in the early experiments and from that simple initiative grew the entire science of medical ultrasound which was first used to clinical usefulness in gynaecology and obstetrics.

It is no exaggeration to say that ultrasound has utterly transformed clinical practice in obstetrics allowing a vision of the fetus in utero which hitherto had only been possible from the sort of post mortem dissections made 200 years earlier by William Hunter.

This short account of the Scottish contribution to obstetrics is unashamedly celebratory of the enormous impact our small nation has had in this speciality. It is perhaps no accident that Scots and Scots graduates have such a hugely disproportionate representation among the maternity hospitals and gynaecological units throughout the British Isles and far beyond. It is a tradition in which our nation and medical school can take great pride.



Figure 5. Professor Ian Donald performing scanning in early pregnancy with an ultrasound machine of his invention.