Anaesthetics

With special reference to Ivan Magill*

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Ivan Whiteside Magill, from Larne, is one of our most illustrious ‘wild geese’ (Fig 1). In 1912 as a medical student he was issued with a certificate confirming that he had, as part of his training, administered one anaesthetic (Fig 2). At that time, this was the only statutory requirement of training in anaesthesia for the qualifying examination of MB, BCh, BAO. The certificate was signed by R J Johnstone (later Sir Robert), Honorary Secretary of the Royal Victoria Hospital Medical Staff, and later (1920–1938) Professor of Gynaecology at Queen’s, and by P T Crymble, then Surgical Registrar at the Hospital and later the Professor of Surgery at Queen’s. There is no evidence of any participation by an anaesthetist — a fair tableau of the standing of anaesthetics at that time.

Magill could well be called the father of modern anaesthesia, having made notable contributions on the control of patient airway and ventilation. His pioneering work made possible thoracic and cardiac surgery as we know it today. Regrettably, his university (QUB) was not appreciative of his work. His MD thesis was referred in 1920; the University did later award him a DSc honoris causa,

*Ivan Magill died on 4 December 1986, six months after this paper was read at the Symposium.

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but not until 1945 when his reputation and achievements were established. He gave a Distinguished Scholar Lecture at the inauguration of the University Department of Anaesthetics in 1958, when he presented all his certificates of honour to the Department. These are too many to list in full, but they include Honorary Fellowship of the Royal Society of Medicine, one of the highest available medical honours. Plastic surgery benefited particularly by his early work and he has been awarded medals by both British and American Associations of Plastic Surgeons, while in his own specialty the Magill Department of Anaesthetics at the Westminster Hospital honours him eponymously, an unusual distinction for one still alive.

In 1913, when Magill qualified, the available anaesthetics were ether, chloroform, ethyl chloride and nitrous oxide. The first three of these were poured on a gauze-covered (Schimmelbusch) mask and inhaled by the patient. These agents were adequate for the operations carried out at the time. Ether and ethyl chloride were both inflammable but electrocautery was not widely used: ether and chloroform provided sufficient relaxation for the limited degree of abdominal surgery. Ethyl chloride provided a rapid induction as at that time there were no intravenous agents.

The names of Gillies and Mclndoe are now well known because of their pioneering work in plastic surgery which started with the blast and bomb injuries of patients in World War I. It is not difficult to imagine the problems which would arise in carrying out plastic surgery on the head and neck with the then available apparatus of a facemask covering the mouth and nose. Magill's major contribution was to introduce a tube into the trachea which not only secured an unobstructed airway but which allowed the anaesthetist to remove himself from direct contact with the face, thus enabling plastic surgery to be carried out. An additional advantage was that the anaesthetist could now inflate the lungs of the patient at will. Thoracic surgery had been hindered by the problems of 'paradoxical' respiration, when, with an open chest and spontaneous ventilation, air would shunt from one lung to another rather than be exhaled, and hypoxia would develop. A balloon on the 'Magill endotracheal tube' sealed the lungs off from the atmosphere and not only was the anaesthetist well out of the surgeon's way but he could now control the patient's breathing. Patients were readily rendered apnoeic by hyperventilation and the administration of a deep level anaesthesia which depressed the respiratory centre. This physiological approach to controlled ventilation has now been replaced by pharmacological means associated with administration of specific muscle relaxants.

Magill's tube literally 'opened' the chest to the thoracic surgeon. He made many refinements including endobronchial (one lung) anaesthesia. He developed laryngoscopes and popularised 'blind nasal' intubation and he also refined the rather crude anaesthetic apparatus which was available at that time by the 'Magill attachment', consisting of a rebreathing or reservoir bag, which is now a household word in the anaesthetic world.

Modern general anaesthesia can be looked on as controlled depression of a number of vital functions. The first of these is consciousness and there are now many agents which can depress this safely. Not all of these, however, will produce adequate muscle relaxation, and specific muscle relaxants which will abolish muscle tone have now been developed. In general these are less toxic than the general anaesthetics and they can also be reversed at will: thus the fears of producing prolonged uncontrolled apnoea, which must have been a nightmare to
the early anaesthetist, are now gone. Reflex suppression, which will minimise the stressful effects of surgery, is also widely practised and many drugs are available for this purpose.

Muscle relaxants abolish tone not only in the abdominal muscles but also in the thoracic muscles; artificial ventilation is therefore a necessary part of a modern anaesthetic technique. The detailed knowledge of the opioid drugs and other cerebral depressants which the anaesthetist requires together with his day-to-day acquaintance with the principles of artificial ventilation have led to his assuming a pioneering role in establishing and staffing intensive care units. Most of these, as in Belfast, started as 'respiratory failure units', and most are now very effectively run by highly trained anaesthetists.

Depression of blood pressure and even cardiac action under anaesthesia, which were other fears of the early anaesthetists, can now be carried out safely and this has led to the important role of the anaesthetist in open heart surgery. A large number of vasodilators, cardiac depressants and adreno-receptor blockers, as well as various cardiac stimulants, are now available to meet the requirements of any heart operation including transplantation. Anaesthesia for cardiac surgery has come a long way from the early hypothermia experience in which patients were literally cooled in a bath of cold water, a practice in general use until as recently as the early 1960s.

Local (localised) anaesthesia has also advanced and is particularly widely used in obstetrics: indeed in some countries the majority of operative procedures are carried out under local anaesthesia alone but this is less favoured in Britain. The anaesthetist, with his wide knowledge of nerve blocks and opioid analgesics, has become involved in the management of chronic pain, working in conjunction with his neurological surgical colleagues. Many pain clinics are now available, such as those held in Belfast, and specialise in the symptomatic relief of chronic pain and in diagnostic blocks.

The academic branch of the specialty has also advanced rapidly. Modern university departments are well equipped with laboratory facilities and, in Belfast, clinical trials and other assessments of as high a standard as that in any other specialty are carried out. Anaesthesia was originally described as an art, but it has now become both an art and a science and a recognised medical discipline on a par with other specialties. Anaesthetists play their full part in undergraduate teaching programmes of medical schools particularly in such practical and applied aspects as care of the unconscious patient and resuscitation. One cannot train a medical student to be a safe anaesthetist in a two-week attachment, but he can be given the opportunity of gaining a healthy respect for the drugs which anaesthetists use, as well as a more than nodding acquaintance with the handling of the anaesthetised patient.

The British Medical Association has just published a report on *Alternative therapy*. The working group was chaired by an anaesthetist, Professor James Payne, of the Royal College of Surgeons of England. One of the 'alternative medical' techniques is acupuncture and I have seen this used very effectively and quite genuinely for a Caesarean section in China. Anaesthetists outside China have not ignored acupuncture and it is being increasingly widely used for pain relief, although at the moment one cannot see its further use in general anaesthesia. Its efficacy, however, may be wider. On a recent visit to the People's Republic of China, I was impressed by its use in the obstetric out-patient department and was assured that it had completely eliminated the morning sickness of
early pregnancy. Could this not be used to prevent one of our still-recurring problems, post-operative vomiting?

The BMA report criticises the claims of 'alternative medicine' because the techniques have not been subject to modern methods of scientific evaluation. Stimulated by the idea that the Chinese claim for 'acupressure' in preventing hyperemesis could be applied to Western anaesthetic practice, we have recently evaluated acupuncture at the P6 (Neiguan) point under standard conditions which would satisfy the most stringent criteria of clinical research. Our findings (summarised in Fig 3), which are based on 175 patients, suggest that acupuncture has a future role in this field: not only does it work but it is cheap and it has few side-effects. To my knowledge this is the first scientific study of this kind in the world and was carried out by members of a specialty which not only keeps up-to-date but — dare I say it? — is often in advance of other medical specialties!

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