

## John MacDonnell and Insensibility with Ether in 1847

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### SUMMARY

John MacDonnell (1796-1892) was born in Belfast and trained in surgery in Dublin, Edinburgh, London and Paris. In 1829 he became a demonstrator in anatomy at the Richmond Medical School where he was appointed visiting surgeon in 1836, and from 1847 to 1851 he held the professorship of descriptive anatomy at the Royal College of Surgeons in Ireland. He was appointed Medical Poor Law Commissioner until 1872 when the Local Government Board and the Poor Law Commission were merged and he continued to serve. In later years, before his death in 1892, he turned his attention to history, but it is his administration of ether to 18-year-old Mary Kane in January 1847 that shines undimmed in his personal history.

### BRIEF BIOGRAPHY

John, son of Dr. James MacDonnell, was born in Belfast on 11 February 1796, educated at the Belfast Academy and moved to Dublin in 1813 as an apprentice to Robert Carmichael, entering Trinity College to take a BA in 1818. After receiving his Licence from the Royal College of Surgeons in Ireland in 1821 he studied at Edinburgh (two years), London (1 year) and Paris (two years) before graduating MD in Edinburgh (1825) and returning to Ireland. He took time off in 1826 to marry Charity Dobbs, daughter of the Reverend Robert Conway Dobbs of Belfast. Of the 11 children born to the couple, 5 were girls. Charity died on 6 April 1890, aged 86. His sister, James's only daughter, married Andrew Armstrong of Kilsharvan, county Meath, and their property passed to John's son, Robert – a surgeon like his father; he died on 6 May 1889, predeceasing his father.<sup>1</sup>

John was appointed demonstrator in anatomy at the Richmond Medical School in Dublin in 1829, elected member of the Royal Irish Academy, and in 1835 applied for and was appointed professor of surgery in the faculty of medicine of the Belfast Academical Institution. He had no teaching duties for a year but then did not take up the appointment, and resigned in January 1836 on his appointment as visiting surgeon at the Richmond. Of the two candidates Robert Adams was appointed, whereupon Carmichael retired, so that the hospital would have 'the benefit of [both] their talents.'<sup>2</sup> For four years 1842-46 he edited the Dublin Journal of Medical Science, that became the Dublin Quarterly Journal of Medical Science in the hands of William Wilde. He still found time to contribute a chapter on fractures to



Fig 1. John MacDonnell (courtesy RCSI)

the Cyclopaedia of Practical Surgery in 1843.<sup>3</sup> From 1847 to 1851 John was professor of descriptive anatomy at the Royal College of Surgeons in Ireland and used his status to address the Lord Lieutenant in a pamphlet on the parlous position of the Dublin hospitals.<sup>4</sup> When he retired the chair he was appointed Medical Poor Law Commissioner until 1872; in that year the Local Government Board and the Poor Law Commission were merged and he continued to serve. In 1884 he published 'An enquiry respecting the question – is the development of the eye in the vertebrate in accordance with, or, on the contrary, contradictory to the Darwinian

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development-theory? <sup>5</sup> When he was getting on in years he turned his attention to history and published *The Ulster civil war of 1641 and its consequences*, with the *History of the Irish Brigade under Montrose 1642-46*. <sup>6,7</sup> Later, he set about absolving his ancestor, Sir Alaster MacDonnell from charges of cruelty in the Ulster civil war of 1641, seven generations earlier. <sup>8</sup> (Figure 1.)

Age could not wither him, for according to his obituarist he was ‘a marvellous old man ... full of vigour, and had as much freshness of mind and body as many men at 65’.<sup>9</sup> He was laid to rest in Kilsharvan graveyard in January 1892 (Figures 2 and 3).



Fig 2. The Graveyard at Kilsharvan, county Meath.

John MacDonnell is interred in front of the cross over his older brother’s grave. The cemetery beside Kilsharvan House may be reached by turning off the southbound M1 motorway at junction 8 and driving on to Duleek, county Meath. The cemetery is signposted off the road between Duleek and Julianstown.

### INSENSIBILITY WITH A SINGULAR AGENT

MacDonnell announced on 1 January 1847 that he had, ‘this morning’, tested ‘the surprising discovery of Dr C T Jackson and Dr Morton, just published in the *British and Foreign Medical Review* by Dr Forbes, - that the inhalation of the vapour’ of ether is capable of rendering a patient perfectly insensible to pain. Through the kindness of Edward Hutton, surgeon at the Richmond Hospital in Dublin on 30 December 1836 MacDonnell had the opportunity to read letters from John Ware of Boston and John Collins Warren (who had etherised Gilbert Abbott in the Massachusetts General Hospital on 14 October 1846), and an extract from an article

by Henry Jacob Bigelow Jr. (1818-1890) in the November issue of the *Boston Medical and Surgical Journal*, describing patients ‘narcotised by inhalation of ether’. Dr Forbes in editorial confirmation referred to two patients that had been narcotised for operation by Robert Liston (1794-1847) in London. (Table 1.) <sup>10</sup>

TABLE 1.

#### *Famous first words*

| Date and Site   | Description   |
|---|---|
| 16 October 1846<br>Massachusetts<br>General<br>Hospital.    | John Collins Warren (1878-1856)<br>glanced at his watch<br><i>‘Dr Morton is not here. I presume<br/>he is otherwise engaged.’</i><br>William Thomas Green Morton<br>(1819-1868),<br>when the patient’s lips relaxed on<br>the vent:<br><i>‘Well, Dr Warren, your patient is<br/>ready for you.’</i> |
| 21 December 1846<br>House of Dr Boott,<br>Gower St., London | Robert Liston (1794-1847),<br>University College London.<br>amputated a leg, and removed an<br>ingrowing toenail<br><i>‘This Yankee dodge beats<br/>mesmerism hollow.’</i>  |

MacDonnell decided to test the effect of inhalation of ether, and assembled an apparatus for the purpose. He procured a bottle with two necks, into one of which he introduced the (air-tight) tube of a funnel into which he placed a sponge saturated with ether. In the other he introduced a double tube furnished with a ball-valve through which respiration might be performed with freedom. ‘The mouth being applied to the tube, and the nostrils closed, the play of the valves, on inspiration, opened the communication between the tube and the bottle, and closed that between the tube and the atmosphere, while on expiration, their play closed the communication with the bottle, and opened that with the atmosphere. Thus the inspired air necessarily passed through the sponge and bottle, and was saturated with the vapour of the ether, and the expired air necessarily passed into the atmosphere’.

With the assistance of his friend and former pupil, Surgeon Alex M’Donnell, John rendered himself insensible for some seconds, five or six times. His assistant observed his pupils dilated, that his pulse rose at the beginning of each inhalation

UNDERNEATH THIS CROSS REPOSES THE BODY OF THE RIGHT HON. SIR ALEXANDER  
McDONNELL, BART. SOMETIME RESIDENT COMMISSIONER ON THE BOARD OF NATIONAL EDUCATION FOR  
IRELAND AND ELDEST SON OF THE LATE DR. JAMES McDONNELL OF BELFAST.  
HE DIED JANUARY 21<sup>st</sup> 1875 AGED 80. IMMEDIATELY IN FRONT OF THIS CROSS LIES ALL THAT WAS MORTAL OF  
DR. JOHN McDONNELL 2<sup>nd</sup> SON OF THE SAID DR. JAMES McDONNELL. HE DIED JANUARY 20<sup>th</sup> 1892 AGED 96  
AND OF CHARITY HIS WIFE, DAUGHTER OF THE LATE REV. ROBERT C. DOBBS  
SHE DIED APRIL 6<sup>th</sup> 1890 AGED 86

Fig 3. John MacDonnell’s memorial at Kilsharvan

and fell to its usual rate on the approach of insensibility, that his complexion was raised each time, and that his lips became blue on one occasion only. Cough enforced by unpleasant tracheal irritation disappeared at the moment of insensibility, at which he 'had the feeling of a profound stun – without pain. An agreeable languor followed recovery and lasted for ten or twelve minutes, and no sensible effect remained half an hour after his experiments.<sup>11</sup>

### THE PATIENT

The operation for which John MacDonnell prepared so assiduously was amputation at the middle of the arm, for suppurative arthritis of the elbow, on Friday 1 January 1847. His patient was a healthy country girl, Mary Kane, aged 18, from the neighbourhood of Drogheda in county Meath. Six weeks previously, in carrying some hawthorn branches, Mary stumbled and fell on them. A thorn punctured her arm near the elbow and 'I have no doubt entered the joint'. Calor, rubor and dolor immediately supervened, and among the emollient and antiphlogistic measures advised were to apply turpentine, bluestone (copper sulphate) and 'some green ointment'. A fortnight after the accident she was sent to the Richmond Hospital.

She was at that time suffering severe pain in the joint, the outer part of which presented a large ulcer, with spongy, flabby granulations, and having an opening, from which a profuse discharge took place, and by which a probe could be passed into the joint. In spite of all our endeavours to arrest the progress of the disease, and latterly to support her powers, she gradually, during the next four weeks, lost flesh to great emaciation, became decidedly hectic, had several times severe bowel complaint, and at length a slough formed over the sacrum, as she could only lie supine.

After failure on the first trial of etherisation, MacDonnell succeeded in establishing complete insensibility. Assisted by Mr. Carmichael, Dr Hutton, Dr Adams, and Mr Hamilton, he carried out mid-arm amputation under ether. Twice before the dressing of the wound was completed, the patient gave evidence of suffering, at the instant of division of the muscles and at the tying of one of the arteries. The patient declared she suffered no unpleasant sensation from the inhalation, and that she felt nothing until she saw the surgeon 'put a thread on her arm'. The pulse was monitored by Surgeon Tufnell: it settled down from 132 to 120 at the beginning of ether inhalation, and to 104 at the commencement of the operation; it rose to 144 at the sawing of the humerus and further to 160 at the end of the operation; soon after return to her ward bed the pulse was 'at the number habitual to her for some weeks, 120. Mr. Brabason reported that 'the pupils were dilated during the whole time of the action of the vapour'.<sup>11</sup>

### SAFE AND SOUND

MacDonnell was happy to confirm the report to which his attention had been drawn in the British and Foreign Medical Review; he stated:

I am sanguine respecting the safety, the great utility, and the manageableness of this singular agent. I conceive that its safety arises from the circumstances that, while it at once abolishes sense and volition, it does not, at the same time, seriously if at all, impair the reflex function of the medulla oblongata, or the action of the heart; the respiratory movements, therefore, go on under the influence of that reflex function and the heart's action maintains the circulation just as, in deep sleep or apoplectic coma, respiration and circulation are sustained ... I anticipate that we shall be enabled to prolong insensibility with safety, for a considerable time, by skilful alternation of the vapour and atmospheric air; having recourse to respiration of air before the ether has permanently injured the nervous system – recurring to the inhalation, before sense is restored.<sup>11</sup>

The safety of 'this singular agent' arises, he conceived, from the fact that respiration and circulation were sustained, even though sense and volition were abolished. And he anticipated that insensibility could be prolonged for a considerable time with safety. Still, careful experiments on lower animals would be advisable before widespread adoption. A footnote added that Mr Tufnell had confirmed MacDonnell's results in four soldiers, and that Mary Kane was progressing favourably on the third post-operative day.

'I regard this discovery as one of the most important of this century. It will rank with vaccination, and other of the great benefits that medical science has bestowed on man. It adds to the long list of those benefits, and establishes another claim, in favour of that science, upon the respect and gratitude of mankind. It offers, in my opinion, an occasion, beyond measure more worthy, for *Te Deums* in Christian Cathedrals, and for thanksgiving to the Author and Giver of all good, than all the victories that fire and sword have ever achieved'.<sup>11</sup>

Self-experimentation traced back with certainty to the middle of the eighteenth century. The first known deliberate experiment involving definite risk was Anton Storck's ingestion of hemlock in increasing quantities to assess its value. Storck was a 19 year old (physician) in Vienna.<sup>12, 13</sup>

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