

HISTORICAL NOTE

The Robinson-Hooper connection*

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The search for a connection between James Robinson, the dental surgeon who on 19 December 1846 administered the first general anaesthetic in England by the inhalation of the vapour of ether, and William Hooper, the pharmaceutical chemist who produced the best publicised and most widely used of the early commercial ether vaporisers, has revealed hitherto unrecognised aspects of the early history of general anaesthesia.

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Some 2 years ago, one of the authors (D.Z.) became involved in an investigation of the claim that a Hooper ether inhaler that had come on the market was the actual one used by James Robinson on 19th December 1846 [1]. Although a number of later accounts state categorically that a Hooper inhaler had been used [2], careful reading of all the early literature, including that collected by Robinson in his *Treatise* [3], showed that this was incorrect, and also failed to show without doubt who had constructed the inhaler used for those first anaesthetics; nor did it provide documentary evidence that Hooper had ever constructed an inhaler for Robinson personally. Attention then became focused on an undated article mentioned by Robinson in his *Treatise* as having been submitted by him to the newspaper the *Morning Chronicle*, which did not appear to have been examined in recent years. This was tracked down by the other author (A.M.), and it, together with a relevant later communication from Hooper himself, provided new and interesting information about the early days of inhalational anaesthesia in England.

In his *Treatise*, Robinson (Fig. 1) wrote that on 19th December he 'used a very imperfect apparatus, hastily got up ...' but did not say by whom it was 'got up'. Having had an improved apparatus constructed by an instrument maker, Mr Elphick [4], he used it, according to the evidence of the *Treatise*, on perhaps five or six patients, if one includes the demonstration on 28 December at which John Snow was present. Then he continued,

'having, in the foregoing cases, given the apparatus a sufficient trial to test its value, I communicated most of them, accompanied by a description, to the editor of the *Morning Chronicle*, who did me the favour of publishing them'. Robinson's letter, which is printed below, appeared on 29th December 1846 [5].

To the editor of the *Morning Chronicle*

Sir – having been the first in the country to employ the inhalation of ether as a means of rendering surgical operations painless, I beg to enclose for your publication the results of several cases in which I have extracted teeth with success under the above circumstances. It was on the 17th of this month that I received from my friend Dr Boott the first intelligence relating to this discovery, and which intelligence had been conveyed to him on that day in a private letter from America, and stated that numerous surgical operations had been performed at Boston, and amongst others numerous extractions of teeth, and I immediately contrived an apparatus for the purpose of testing these remarkable allegations. On the 19th in the presence of Dr Boott and his family at his own residence, I operated upon a young person thrown into sleep by the inhalation and extracted a molar tooth from her lower jaw. The inhalation occupied a minute and a half, and the patient's recovery from sleep another minute. Dr. Boott questioned her respecting the tooth, and she expressed her great surprise at finding that it was removed. She said that all she had felt was merely a



Figure 1 Dr James Robinson.

sensation of cold around the tooth, a sensation which was caused perhaps by the coldness of the extracting instrument. The apparatus employed consisted of the lower part of Nooth's apparatus, with a flexible tube, to which was attached a ball and socket valve and mouthpiece similar to those commonly used for inhalation. I repeated the experiment a few days after on other parties, but in several cases, little or no effect was produced by the vapour; the fact was that the ball and socket valve though impervious to water, was not so to air, moreover, as the patient was becoming insensible, and the breathing tranquil and involuntary, he had no longer the power of raising the ball. Hence the breath passed into the vessel and diluted the ether vapour, and only an incomplete insensibility ensued. Instructed by these circumstances, I have had another apparatus made by Mr Elphick, of Castle Street, Oxford Street. It consists of a mouth piece, containing two valves, a perpendicular one which permits a perfectly free inhalation, but closes when expiration begins, and opens the other, a horizontal valve, with a perpendicular action at the top. By this means inspiration and expiration are other allowed with the greatest freedom. To the end of this mouth piece is attached a pad, containing a spring well stuffed and adapted to the external contour of the mouth, also a clip for compressing the nostrils, and this preventing the patient from drawing in the air, either through the nose or by the corners of the mouth. This apparatus I tried on Saturday the last on two patients, from one of whom I

removed an upper molar, from the other a deep seated stump. My success was complete. Yesterday I again operated at my house, in Dr Boott's presence, on Mr Dixon, surgical instrument maker of Tonbridge Place, New Road. The account he gave of his status during the operation is extraordinary: he described that he underwent a most remarkable dream, in the course of which all that he had done and read and known, and all the events of his early youth, seemed to be 'compressed into a circle'. He then felt as if an evil spirit was endeavouring to triumph over him, but still his confidence in his own victory was predominant. The actual removal of the tooth seemed to be co-incident with the last effort of the supposed evil spirit. In half a minute the patient was conscious of the presence of those around him and in two minutes he was fully recovered. He had been completely unconscious of the operation. This morning at the Metropolitan Free Hospital, in the presence of several medical men, I again operated in two cases with some success – one a child of 12 years of age, and the other a young man of 27 years of age. From the child I removed two teeth, from the man a large molar tooth from the upper jaw; the latter on being questioned as to pain, replied that he knew nothing about it as he had lost his brains. Both recovered in two minutes and left the hospital perfectly well. In conclusion, I may remark that I entertain the most confident hopes that at last a means is provided which beyond all fears of failing, without any reference to the peculiarities of individual temperament, susceptibility or idiosyncrasy, will be at the service of all who are obliged to undergo the operations of dental surgery. I trust however that no incautious or unwarrantable experiments will be tried – that whether the patients suffer pain or not the worth of the human body will be too thoroughly recognised by all humane and scientific men to allow them to palter for one moment with the interests or in the avenues of life, the general humanity and enlightenment of the age will thus allow a discovery to be harmless which might otherwise have been made the means of much reckless mutilation. In this case the new application of steam will be, indeed a wide blessing and the steam of ether and other substances innumerable, if properly applied, may lead to results as new, whether in surgery, physiology, or psychology, as the steam of water and its application has been in the physical, domestic and social existence of mankind.

I am sir, your obedient servant,
James Robinson, Surgeon Dentist
7 Gower Street, December 28th, 1846

There are several points of interest. About his first inhaler Robinson states explicitly that he personally 'immediately contrived an apparatus', so ruling out any participation by Hooper. The reference to a further trial 'a

few days later' is misleading. Robinson is not very reliable about dates. There is evidence that after anaesthetising Miss Lonsdale he tried his first inhaler on one or two more patients on 19th December, or debatably on the 20th, without success [6]. How quickly Mr Elphick worked is not known, but it must have taken 2 or 3 days to produce the improved inhaler. The Saturday on which Robinson first demonstrated it was 26th December, Boxing Day; there were no extended bank holidays then. 'Yesterday' was Sunday, and on Monday the 28th he demonstrated two cases to John Snow and two other general practitioners. So in all he used the new inhaler for 3 days before writing his letter to the *Morning Chronicle*. It is difficult to square the number of cases mentioned with those described in the *Treatise*, but even the most charitable reader would have to admit that the letter was based on very little experience. To 'palter' (related to 'paltry') means 'to trivialise.' A further search showed that this letter was printed also in the same week's *London Medical Gazette*.

Patients' perceptions of general anaesthesia

Most histories of anaesthesia have been Whiggish, presenting its introduction as the culmination of the development of civilised society [7]. Excluding the limited objection to pain relief in labour by a section of the medical profession, it has been presented as the greatest boon to mankind; so it was unexpected to find that there was resistance to general anaesthesia among the public from the beginning. Although popular perceptions of the early days have been extensively researched and amusingly described [8], this aspect has not previously been recognised. The description by the instrument maker Mr Dixon appears to be the first account of the unpleasant sensation that can be experienced during induction. As will be mentioned later, this entered into the public domain quite quickly, and had a deterrent effect. More surprising is the speed with which loss of consciousness came to be resisted by some members of the public. As early as 28th December, Robinson's second patient, a youth of 17 years of a weakly and nervous constitution, 'objected to inhale the vapour, having heard, as he said, that "I sent people to sleep and then took out the whole of their teeth"'. By this date Robinson had anaesthetised fewer than 10 patients, perhaps only half a dozen; so where could this rumour have come from, so early in the history of general anaesthesia?

The use of oxygen

After the introduction of general anaesthesia, one of the earliest concerns had been the mode of action of ether. It

was immediately realised that the vapour would displace an equal volume of air from the inspired mixture. Snow's tables of ether uptake showed that at 64 °F (18 °C) about half would be ether, reducing the oxygen content to 10%. The argument was whether ether anaesthesia was merely asphyxiation. On 13th February 1847, at a meeting of the Westminster Medical Society, John Snow described how he had added oxygen to the ether-in-air mixture inhaled by mice, and found that anaesthesia was induced as usual. 'Mixed with oxygen gas it affected mice as powerfully as when mixed with the air, as he had found in several experiments. Asphyxia was a very different state from that produced by ether' [9]. He concluded that oxygen did not counteract the anaesthetic action of ether vapour; but there was the implication, as a result, that there was no need for oxygen in general anaesthesia. Nevertheless, Robinson began, during the third week of March, to administer a few breaths of oxygen to his patients during recovery, as described in the following letter:

Agent for resuscitating patients after inhaling the vapour of ether

To the editor of the *Medical Times*

Sir – For the last week I have been using as an agent for resuscitating patients after inhaling the vapour of ether, pure oxygen gas, with the most perfect success. To-day I operated in nine cases on the teeth; to each patient I administered a full dose of the vapour of ether; and subsequently a few inhalations of oxygen. In not one case did the patient complain of debility &c, but recovered perfectly in less than a minute and a half, timed by the medical men present. I will, by your permission, furnish, in a future number of your journal, the details of these and other experiments with oxygen. I remain, Sir, Your obedient servant,

J. Robinson

7 Gower-street, Bedford-square, March 29

The details that he promised have not been traced, but a communication from Hooper to the Pharmaceutical Society a month later provides evidence, the only evidence we have been able to find, of direct contact between Robinson and himself. Hooper's letter is so full of interest, and shows such acute observation by an enquiring mind, that it is reproduced in full [10]. The suggestion, at such an early date, of patient-controlled analgesia, is astonishing.

The interest relative to this valuable adjunct to ether daily increases, and I am happy to say that our physiologists are taking up the subject in a spirited way. I have no doubt every operating Surgeon and dentist using the latter will adopt the former, not that I imagine there is danger in etherising without oxygen being afterwards inhaled, where due discretion is observed; but the adoption of so satisfactory a reagent will give

the faculty such confidence in administering it as will tend to its universal use. For the inhalation of this gas I have added the necessary requisites to the inhaler Mr. Robinson originally introduced, and which is on the table: it is so constructed that the oxygen may be either given or not, affixed or detached, as the operator may wish: the brass-work connected to the glass vessel and tube contains a two-wayed stop-cock, and to which is annexed by a union joint a gas bladder with a plain stop-cock. I supplied Mr. Robinson with an inhaler of this description, which answers in every respect. His incessant investigations in reference to the inhalation of the vapour of ether, must ever be allied to its recent history. As ether deprives the system of oxygen, it is most reasonable to conclude that the subsequent inhalation of this gas is very applicable. To many, the effect of being *fully* etherised is very analogous to that of drowning, that is, in calling to mind the events of childhood &c., which had not been thought of for many years, and in such cases, oxygen is found to be the best resuscitating agent. I have, however, no hesitation in saying from personal experience and authenticated accounts that have come to my knowledge, that it is not necessary, in order to cause insensibility to pain, that etherisation should be carried to its full extent. I look on this fact as of the greatest importance, and which will cause ether to be a greater blessing to mankind than we originally contemplated – the idea of losing the mind having been a great impediment to its use. The five senses appear to be peculiarly independent of each other, as far as the effect of ether is concerned, inasmuch as that of smelling is the *first* we are deprived of, then that of taste, followed by that of feeling, whilst the sight and hearing remain, and the mind of the patient is perfectly quiescent. At this stage the operation should be commenced by the patient's direction. I quite expect the day will arrive when patients will conduct the inhalation themselves, but at present it should not be given against their will. The vapour of ether acts much more efficiently and pleasantly on an empty stomach; and a meal shortly after its use, especially animal food, prevents nauseating and depressing effects. I have much pleasure in giving these remarks, being the result of my taking and administering these newly-discovered agents for the purpose to which they are here assigned.

7 Pall Mall East, April 14, 1847

Although Sykes states that Hooper's oxygen attachment was marketed, there is no evidence for this [11]. For one thing, quite apart from Snow's demonstration, pure oxygen was not readily available. It was prepared, if required in any volume, by raising manganese oxide to red heat in a wrought iron container; 1 pound of powder

was said to yield between 2 and 5 gallons, equivalent to 8–20 litres [12]. It might be stored in a metal gas holder, or more portably in a rubber bag. But with human nature subject as it is to Newton's First Law, the 'Law of Inertia', it was many years before oxygen became employed as an adjunct to general anaesthesia. Perhaps more interesting are Hooper's comments about the public's resistance to general anaesthesia. He himself was obviously a keen advocate of its benefits, and anxious to overcome anything that might inhibit its use. He was not alone among the early practitioners in observing the gradual obtunding of the senses during induction, leading to the state of ether analgesia. John Snow almost simultaneously said of the former, 'Ether seems to decompose mental phenomena as galvanism decomposes chemical compounds ...' [13]. But Hooper appears to have been the first to suggest that the state of ether analgesia might be induced deliberately, and maintained during an operation. Even more remarkable is his suggestion that it might be entirely patient controlled. Truly, in this respect, as in one or two others, he was a man born before his time.

References

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