

## Leechcraft in nineteenth century British medicine

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In the early nineteenth century, British physicians accepted the use of leeches as an ancient and honourable part of their professional heritage<sup>1</sup>. Moreover, the beneficial consequences of leeching were immediately obvious to physicians and patients alike. At that time, diseases were generally conceived as collections of morbid symptoms. For example, local inflammation was typically defined as a combination of swelling, heat, redness, and pain<sup>2</sup>. These features were taken to indicate an excessive quantity of blood in the affected area and could thus be relieved, if only temporarily, by abstraction of blood from the inflamed site. Leeches were deemed especially useful in areas too constricted to allow other methods of local bloodletting—for example, around and within the nose and ears, inside the mouth and in the rectum and vagina. They were also used as a method of general bloodletting—for example, in a patient too weak or otherwise unable to withstand venesection. The usual principle, however, was to place them as near as possible to the focus of the morbid process: for headache, on the temples; for gastrointestinal inflammation, on the epigastrium; for bladder troubles, on the shaved pubis; and for menstrual disorders, on the thighs, the groin and the vulva<sup>3,4</sup>.

### TECHNIQUES

When brought into contact with a living animal, a leech punctures its victim's skin with a bite that 'resembles the emblem on a Mercedes-Benz'<sup>5</sup>. It then secretes various anaesthetic, anticoagulant and diffusing agents, and for about half an hour sucks the blood that flows from its host. Tests conducted in the early nineteenth century indicated that a leech would consume about half an ounce of blood (15 mL) before detaching itself<sup>6</sup>. However, leeches are sometimes reluctant to perform their duties, and the medical use of leeches required mastery of certain techniques. In 1804, Wilkinson recommended that the area to which leeches were to be applied should be washed with soap and water, rinsed thoroughly, and, when appropriate, shaved very close to the skin: 'I have found the sharp points of the incised hairs so greatly to annoy them, as to prevent their fixing<sup>7</sup>'. He observed that leeches could best be controlled if placed in a wine glass; this was

useful not only 'for observing their motions, circumscribing their limits, retraining them in their proper place assigned for their bite, but it also tends to support them when filling, and thereby prevents their separating from the parts sooner than they otherwise would do.' Wilkinson recommended using smaller glasses when applying leeches to the temples, pubes, groin, scrotum, knee or elbow joints, or eyelids, or to the limbs of children. If leeches were reluctant to bite, they could be encouraged by rubbing the target area with sugar-water, milk, or, most effective of all, a small quantity of fresh blood. Later in the century, practitioners found that submerging leeches in diluted wine or, very briefly, in warm full-strength porter, would cause them to bite and suck vigorously<sup>8</sup>. If a leech became attached at the wrong site (or 'what is equally bad' the practitioner's fingers) it can be made to release its hold by sprinkling table salt on its mouth<sup>9</sup>. Wilkinson warned that the practitioner should 'be careful not to pull at the animal lest he destroy it, and perhaps ineffectually put the patient or himself to unnecessary pain.'

### Anus

Through the nineteenth century, there was considerable interest in improving techniques for applying leeches to less accessible areas of the body. In 1818 William Brown observed that morbid accumulations of blood commonly developed in the head and the lower belly. 'These congestions are often repeatedly relieved by the efforts of nature; in the one case by bleeding from the nose, and in the other by bleeding from the extremity of the rectum<sup>5</sup>.' However, Brown criticized British physicians for being slow to develop alternative methods for use when these 'efforts of nature' were inadequate. Brown recommended the following procedure for taking blood from the haemorrhoidal veins—a procedure he described as well-established in many parts of Europe. The patient

'is seated on a perforated chair, which only uncovers the anus itself; the operator, stooping or kneeling, by means of a taper, sees the part to which the leech is to be applied; and, provided with a small round wide-bottomed bottle with a long neck, just large enough to contain one leech, he allows the animal to crawl out and fix itself on the part intended. The operator having applied one leech, withdraws the bottle, and proceeds to

fix one after another till the desired number have been applied; a basin is placed under the chair into which the blood flows'<sup>5</sup>.

Brown pointed out that this technique was useful in most abdominal inflammations 'such as hepatitis, enteritis, puerperal fever, [as well as] in suppressed menses, lochia, etc.'

### Mucous membranes

Since disease processes often involve the mucous membranes, it seemed desirable to apply leeches to these as well, but this was often difficult. Through the first decades of the century, physicians announced new techniques for doing so. In 1822 Philip Crampton reported that, 'in every kind and degree of inflammation of the eye' one or two leeches applied directly to the conjunctiva 'had a more decisive effect in unloading the inflamed and turgid vessels of that membrane, than the application of five times that number to the temple and eyelids'<sup>6</sup>. Encouraged by this success, Crampton also applied leeches directly to inflamed tonsils. But this procedure involved obvious risks: leeches could become displaced and accidentally suffocate the patient. To avoid this problem,

'a single thread of silk was passed through the body of the leech, at about its lower third, the ligature being made fast to the finger of the operator, the leech . . . was introduced into the mouth, and its head, directed by a probe, was brought in contact with the inflamed tonsil. The animal fixed itself to the part in an instant, and, in less than five minutes, being gorged with blood, it fell upon the tongue, and was withdrawn'<sup>9</sup>.

A later physician reported that passing threads through leeches, 'far from incapacitating them from action, causes them to bite with increased ardor, and, in fact, may be used to stimulate torpid leeches'. Crampton reported that when leeches were applied in this way, 'relief [to the patient] was immediate'. He also found that the application of leeches to the internal surface of the nostrils provided the greatest possible relief in cases of 'undue determination of blood to the brain' or in cases of habitual nose-bleed.

### Larynx

A decade later, in 1833, Osborne acknowledged the value of Crampton's pioneering work and recommended a few improvements. In bronchitis, he observed, 'the application of leeches to the larynx and to the trachea in the triangular space between the mastoid muscles, has appeared . . . to be the most decisive and immediately successful remedy of all those I have ever employed'. This use of leeches was also

effective in laryngitis and was 'of singular efficacy in stopping the cough of phthisis, in so much, that by resorting to it . . . we have been enabled to secure sleep at night, and during the day to keep the phthisical patients so free from cough that a superficial observer might readily believe that we had cured the disease.'

Osborne also pointed out that leeches would continue to suck when submerged in water 'at a temperature considerably above 100 degrees[F]'. This meant that the patient could be placed in a warm bath; when the leeches finished sucking and dropped off, the warm water ensured that the bites continued to bleed so that more blood was extracted. One physician, 'desirous of being enabled to get about among [his] patients as speedily as possible, applied sixty leeches to his own sprained ankle which he then soaked in hot water. 'The consequence,' he reported, 'was not merely a faintness, like death, from which no measures could for half an hour or more restore me, but an excessive degree of general debility, from which I did not recover entirely for months'<sup>10</sup>.

### Rectum

Osborne felt that his own most valuable contribution to leechcraft was in solving a problem that had long vexed physicians. In treatment of intestinal inflammation, application of leeches to the anus had little effect, and 'to apply them internally is often difficult, on account of the violent contractions of the sphincter.' Osborne overcame this difficulty by use of a grooved metal rod (with an elegant leather handle) that he designed and ordered to be constructed especially for the purpose. In using the rod, Osborne explained, one first passes a thread through the *tail* of the leech (as Crampton had recommended a decade earlier). It is then placed in the groove of the instrument and,

the operator, holding the ends of the threads, introduces the instrument into the rectum, and pushes it up so as to cause it to draw up the leeches along with it into the rectum. When they have thus been conveyed up beyond the sphincter, the instrument is withdrawn, and the leeches are suffered to remain till gorged with blood and loosened from their hold, when they are drawn out by means of the threads which the operator retains outside the anus.'

Osborne observed, 'I have never used more than four leeches at once, in this way, fearing lest too great a haemorrhage might be produced.' Similar devices were constructed later in the century to allow leeches to be applied rectally to the prostate gland<sup>11</sup>.

## Vagina

Leeches were regularly introduced into the vagina to stimulate menstrual flow and to treat various feminine disorders. However, one obstetrician, Samuel Ashwell, found the leeches applied directly 'to the os uteri . . . [were] decidedly more beneficial than any other local depletion'. He pointed out that 'the speculum tube may be introduced into the vagina prior to their application; and if the cervix be brought fully into view, neither the vagina nor any other part than this portion of the congested viscus will be fixed on by the leeches'<sup>12</sup>. Ashwell recommended that this indelicate use of leeches be 'confined to married women' and that 'a clever nurse should be taught to apply them'.

## Multiple applications

While treatment of a single disease episode often involved only a few leeches, sometimes many more seemed to be required. 'A gentleman [who] fell from his horse and severely bruised the elbow-joint' was treated by the application of 118 leeches over the course of four days<sup>13</sup>. Between 22 July and 3 August 1824, 130 leeches were applied to the inflamed testicle of a single gonorrhoea patient<sup>14</sup>. In four days, 160 leeches were applied to the abdomen of one woman in an unsuccessful attempt to save her from puerperal fever<sup>15</sup>; however, one year earlier a case of severe metritis, 'was subdued by the application of 220 leeches and two venesections within ten days'<sup>16</sup>.

## DRAWBACKS

There were various difficulties and dangers associated with the use of leeches. Leech bites, an obvious indication of recent medical treatment, could be embarrassing. Referring to treatment of testicular inflammation, Astley Cooper, the surgeon, observed that in private practice he saw 'persons in whom it is of the greatest consequence that a bleeding from these parts should be concealed'<sup>17</sup>. Cooper, recommended that, in such persons, rather than leeching, one should carefully use the lancet to open a few veins in the scrotum.

A more serious hazard was that leeches applied to the throat could suffocate patients, or be swallowed and then attach themselves within the lower oesophagus, 'thereby causing extensive mischief'<sup>18</sup>. This difficulty was controlled by attaching threads to the leeches that were to be used inside the mouth. Another common and serious drawback was that leech bites sometimes bled profusely and led to an excessive loss of blood; within a few hours, even the small bite of a single leech could become life-threatening. In 1819 Anthony White reported that a two-year-old girl had died from the loss of blood induced by a single leech<sup>19</sup> and similar deaths were described through the century. Physicians recommended that, where possible, leeches be

placed over solid internal tissue such as a bone, so that pressure could be applied to stop the bleeding. Alternatively, one should be prepared to stitch the bite together with a needle and silk thread<sup>19</sup>, or to employ cauterizing agents<sup>20</sup>, ligatures<sup>21</sup> or plaster of paris<sup>22</sup>.

Another risk was that the leech bite could itself become the focus of subsequent morbid processes. One physician advised against applying leeches to the eyelids, or to the scrotum or penis, because he had seen 'very violent inflammation, and even gangrene, result from it . . . an accident by which the reputation of the surgeon cannot fail to suffer'<sup>23</sup>. He also observed that leech bites could give rise to erysipelas. Another physician argued against the use of leeches in uterine disorders since they were seldom beneficial and the bites 'easily changed into as many cancerous ulcerations'<sup>24</sup>. There was also a persisting concern that reused leeches might themselves convey diseases from one person to another. Early in the century, Wilkinson did not believe that leeches 'which may have been previously applied to patients in the small-pox, measles, scarlet fever, venereal buboes, or other affections of this sort, or to cancerous, venereal, or phagedemic ulcers, bite of a mad dog, or any other specific disease whatever, will or can communicate a similar affection'<sup>5</sup>. However, reports occasionally suggested otherwise: in 1827 one article claimed that leeches had conveyed syphilis to a child after being used to treat a syphilitic patient<sup>25</sup>.

## SUPPLY

### Recycling and bdellotomy

The general expectation seems to have been that leeches should be destroyed after being used, but from early in the century there were attempts to reuse them. Wilkinson caused the animals to disgorge by applying salt to their mouths, and when unable to secure fresh leeches he used in rotation five different leeches 'for at least 50 times' over seven months. He pointed out that this could save considerable money and, even more significantly, by conserving leeches it was 'a principal means of preventing their future scarcity'<sup>5</sup>.

A few years later another physician, himself in need of leeching but unable to procure a sufficient number to do the job, hit on a similar method: as the leeches fell off, he immersed them in a cup of vinegar: . . . 'In this manner each of them was tortured four or five times, after which the whole were put into clean water, and appeared as lively as at the first'<sup>26</sup>. With methods such as these, physicians claimed that a given leech could be used as often as every third day and for as long as three years<sup>27</sup>.

Another way of conserving leeches was to cut open their digestive tracts so that they lost all the blood that they consumed and continued sucking without limit. This

technique was perfected by a German physician, Julius Beer, who called it bdellotomy. Beer claimed that some of his bdellatomized leeches had 'for six days running, performed their duties... passing off the blood either through the original wound or through a freshly made one'<sup>28</sup>. He thought that this technique would prove especially useful in treating children or persons suffering from diseases of the uterus or of the eye where there was space for only a limited number of leeches to become attached. Moreover, by suspending the posterior end of the bdellatomized leech in a glass container, one could retain and measure exactly the extracted blood. Thus, Beer claimed, his method had three advantages over conventional leeching: '1. Humanity suffers less; 2. Economy is promoted; and 3. Precision is introduced into the art of local-bloodletting'.

### Hirudiculture

At the beginning of the nineteenth century, leeches were generally harvested 'by the children of the poorer peasantry' who simply waded and splashed in the water and collected the leeches that became attached to their legs<sup>29</sup>. By the 1830s things had changed dramatically. In 1836 John Pereira wrote, 'The consumption of leeches must be enormous'<sup>30</sup>. He pointed out that, collectively, the four largest London dealers imported, on average, 600 000 leeches monthly or 7 200 000 a year. Most of these imports came from France, Germany, Silesia, and Poland<sup>31</sup>. By the middle of the century, there were improved techniques for harvesting leeches; this was accomplished by drawing nets with bait (usually the liver of a recently slaughtered animal) through the water. However, the harvesting in vast numbers meant that leeches soon ceased to exist in whole areas of England; it seemed likely that, within a decade, leeches would be extinct in western Europe. In England, a tax was levied on imported leeches for the purpose of fostering domestic production and thereby making the country 'independent of nations with which we might be at war'<sup>32</sup>.

The decline in the natural supply of leeches led to the development of leech farms and to the pursuit of hirudiculture. Anxious to ensure their own supply, medical faculties, hospitals, and some governmental units established their own large reservoirs in which leeches could be cultivated. Farmers began growing leeches commercially. The main problem in hirudiculture was supplying an adequate quantity of blood to enable leeches to breed and grow rapidly. At first, this was achieved by driving into the swamps

'wretched, lame, and worn-out horses. But these poor beasts, unfortunately, died too quickly for the leech-growers' account. . . . It is now found more economical to feed the leeches on cows. The heavy, dull animal,

haggard, frightened, and yet resigned to its fate, bears the onslaught of the leeches, which are attached like bunches of grapes to its belly and legs, with a sort of stupid surprise. . . . A breeder. . . who has four hectares of marshes, drives into them every year upwards of 200 cows and many dozens of donkeys for the nourishment of 800,000 leeches'<sup>33</sup>.

Through the 1830s, improved techniques for conserving and shipping leeches expanded the opportunities for trade. In January 1841 a sea captain bought 20 000 leeches in Madras, India. They were kept in earthenware tubs on the deck of his ship and received no special care. When the ship reached the Cape of Good Hope the captain sold the surviving leeches for a profit of more than £100 Sterling<sup>34</sup>. In the late 1840s leeches were regularly imported into western Europe by land and sea from Turkey and Egypt<sup>35</sup>, and in the 1860s vast numbers of leeches were exported from Australia to Europe and to America. In 1867, the Murray River Fishing Company of Sydney, Australia reported that '2,000,000 to 3,000,000 of leeches will pass through their hands this season'<sup>36</sup>.

The demand inevitably drove up prices. In 1804 Wilkinson reported that leeches in the Covent Garden market were eight or nine shillings a dozen, whereas 12 years earlier they had been three shillings a hundred<sup>7</sup>.

In a hospital near Nottingham, probably typical of English hospitals generally, demand for leeches crested in the 1830s and then fell in the next two decades; by the mid-1850s, annual expenditures for leeches were less than one-twentieth what they had been two decades earlier<sup>37</sup>. By 1879, one of London's major importers, a company that had formerly sold more than 30 000 leeches a week, was selling only one-tenth as many, 'most of which go to Scotland'<sup>38</sup>. Whatever therapeutic benefits they may have offered, leeches passed out of fashion.

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