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Historical Article: *Hirudo medicinalis*: ancient origins of, and trends in the use of medicinal leeches throughout history

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Summary Blood letting and the therapeutic use of *Hirudo medicinalis* date back to ancient Egypt and the beginning of civilisation. Their popularity has varied over the years, reaching such a peak in Europe between 1825 and 1850 that supplies were exhausted. Towards the end of the century they fell out of favour and, during this period, the leech, once used by the physicians of emperors and influential academic surgeons, became associated with lay therapists and quackery. Leeches have enjoyed a renaissance in reconstructive microsurgery during the last 15 years, having been used by maxillofacial [Br. J. Oral Maxillofac. Surg. 41 (2003) 44] and other reconstructive surgeons to aid salvage of compromised microvascular free tissue transfers [Laryngoscope 108 (1998) 1129; Br. J. Plast. Surg. 34 (1984) 358], replanted digits [Int. J. Microsurg. 3 (1981) 265], ears [Ann. Plast. Surg. 43 (1999) 427], lips [Plast. Reconstr. Surg. 102 (1998) 358; J. Reconstr. Microsurg. 9 (1993) 327] and nasal tips [Br. J. Oral Maxillofac. Surg. 36 (1998) 462]. Peer-reviewed evidence suggests that the survival of compromised, venous-congested tissues is improved by early application of a leech [J. Reconstr. Microsurg. 12 (1996) 165; Arch. Otolaryngol. Head Neck Surg. 114 (1988) 1395; Br. J. Plast. Surg. 45 (1992) 235]. Leeches have also recently been used to treat a wide range of conditions, including periorbital haematomas [Br. J. Ophthalmol. 75 (1991) 755], severe macroglossia [Otolaryngol. Head Neck Surg. 125 (2001) 649; J. Laryngol. Otol. 109 (1995) 442] and purpura fulminans [Ann. Plast. Surg. 35 (1995) 300]. The first medicinal leech farm, Biopharm, was set up in Swansea in 1981 by Dr Roy Sawyer, and now supplies leeches to hospitals all over the world. In this paper, we summarise the history of treatment with *Hirudo medicinalis* from its origin to the present day, and take a brief look at the possible future of the annelid.

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History of leech therapy

Hirudo medicinalis has stimulated human imagination for centuries. Its intimate contact with humans have provoked a somewhat symbiotic relationship in which the leech feeds off humans and humans use the leech for medicine, stories and imagery in popular culture[12,13] (Fig. 1).

It is impossible to note accurately the time when man learned of the existence of leeches. However, we do know that both the annelid and the doctor have been closely linked since the dark ages. 'Leech' is derived from the Anglo-Saxon word 'laece' which, when literally translated, means physician. It is also important to note that 'leech' is etymologically distinct from the Latin word 'Hirudo'. The name *Hirudo medicinalis* was assigned by Linnaeus in 1758.[14] Linnaeus (also Carl von Linné, 1707—1778) was a Swedish botanist, physician and zoologist whose work laid the foundations of modern biological systematics and nomenclature.

The first recorded use of medicinal leeches dates back to ancient Egypt and the beginning of civilisation. Leeches can be seen in wall paintings found in sepulchre of the 18th dynasty pharaohs (1567—1308 b.c.). The first written record of their medicinal use has been attributed to Nicader of Colophain (200—130 b.c.) in his medical poem *Alexipharmaca*.[15] In the 1st century a.d. there was more extensive written reference to their usage. About this time, Chinese writings described medicinal leeching, as did references in Sanskrit, Persian and Arabic literature. The Romans were also familiar with leeches during this period, and it was they who named them 'Hirudo'.

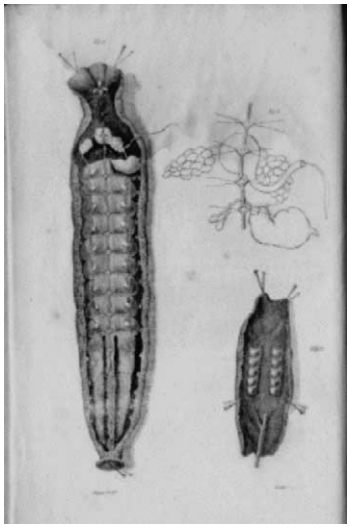

Figure 1 Johnson, James Rawlins. 'A treatise on the medicinal leech' (London, 1816) (History & Special Collections UCLA Louise M. Darling Biomedical Library).

Plinius, described and noted that leeches sucked blood, and documented their useful effects when treating 'rheumatic pains, gout or fevers of any kind'. He compared them with sanguisuga—from sanguis (blood) and sugo (I suck).

The Syrian, Themisson of Laodicae, a pupil of Asclepiades[16] advanced the use of leeches for blood letting at the beginning of the Christian era. He postulated that evil spirits caused illness and removal of these evil spirits required withdrawal of blood. Galen (130—201 a.d.), physician to Marcus Aurelius, further advanced the practice of blood letting through the development of his humoral concept of disease. This concept built on one first outlined by Hippocrates (460—370 b.c.), who believed in the rule of harmony and the theory that all body systems were in balance and that disease resulted from imbalance.

Galen taught the importance of maintaining balance between the four bodily fluids, or humours: blood, phlegm, yellow bile and black bile. Each fluid was associated with a specific personality characteristic. The belief was that removal of the patients blood would correct the humoral imbalance and restore good health. Alexander de Tralles (525—605 a.d.) even treated hearing loss with leeches, in addition to more novel treatments, such as the juices of roaches. Avicenna (980—1037 a.d.), believed that leeches drew blood from deeper sources than wet cupping. His '*Canon of Medicine*' included several pages of instruction about leeches.[17]

In the Middle Ages, barber surgeons, armed with a staff for the patient to grasp (so the veins on the arm would stand out sharply), a basin to hold leeches and catch blood, and a copious supply of linen bandages, continued the practice of blood letting.

The blood stained linen bandages wrapped around the barber's pole in the wind was responsible for the modern day red and white striped pole outside some hairdressers salons. The earliest barber's poles were surmounted by a leech basin, which in time has transformed into a ball on top of the poles.

Leeches were kept in special vessels that were filled with water and had perforated tops to let them breathe. Early leech jars were glass (Fig. 2), and later ceramic, and were often beautifully decorated and highly prized collectors' items. For house calls, physicians would often carry small glass or pewter containers containing a dozen or so leeches.[18] Leeches were better tolerated than other methods of blood letting (e.g. the *fleam* and the *scarifier*[19]) (Fig. 3) as the pain of the bite was