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AS WE WERE...

Gardeners and herbalists: the first anaesthesiologists?

Most anaesthesia historians define the beginning of modern anaesthesia as the moment when William Morton gave ether anaesthesia in the Massachusetts General Hospital on 16 October 1846. But in fact, anaesthesia had been created many times for many hundreds of years before this. The problem lies in trying to produce absolute scientific proof for events hundreds or thousands of years ago.

Opium has been available for use for at least 6,000 years. Seeds of *Papaver somniferum* have been found in Neolithic burial sites in Spain. The Egyptian civilisation created a wealth of medical papyri in which obscure recipes defy modern pharmacological rationalisation. However, they did use Blue Lotus flowers which, when steeped in wine for some time, created a sedative effect from the alkaloids, like nuciferan and aporphine, that were released.

Mandrake root was a popular ingredient in sedative recipes from the time of the Greeks right through the Middle Ages. Dioscorides described the use of mandrake to produce an unconscious state, and the plant does contain alkaloids like scopolamine. Other plants used to relieve pain include turmeric (which contains curcumin and was popular in

Ayurvedic medicine as an analgesic) and cloves (which contain eugenol and were advocated for the relief of toothache). Willow trees contain salicylates, and their products were used by the Sumerian and Assyrian civilisations. Aspirin was derived from meadowsweet by Bayer following an idea put forward by Felix Hoffman. Lettuce was regarded as a useful sedative, and Beatrix Potter, who herself had a huge herbal garden at her house in Ambleside and actively collected plants for medicinal use during World War One, highlighted this in *The tale of the flopsy bunnies* who ate too much of Mr McGregor's produce and were captured by him while sleeping off the effects! Hemlock was said to have been used by Socrates to hasten his death. It contains the very potent alkaloids, conhydrine and coniine, the latter being a powerful respiratory depressant. Henbane contains

other alkaloids, including hyoscyamine, atropine and scopolamine.

Combinations of all these herbs and plants have been used over the centuries to produce an unconscious state. The major problems encountered with their use were firstly, the lack of reproducibility with different levels of alkaloids found in the same species, and then secondly the proximity of therapeutic and toxic threshold! In one of the Cambridge University Libraries there is an illuminated manuscript entitled 'How to make a drink that men call dwale to make a man sleep whilst men cut him!' This drink contains a mixture of hemlock, mandrake, lettuce and opium in wine, and presumably it worked. Those performing archaeological pharmaceutical research in the old medieval hospital at Soutra Aisle in the Scottish Borders have found

seed-ball groups with combinations like many medieval recipes and, in nearby rooms, fragments of sawn bone! So, for many, many centuries it is likely that monastic orders housed the first of our profession, and utilised products from their extensive herbal gardens to create states (anaesthesia!) which permitted surgical treatment.

Seishu Hanoaka (1760–1835) in Japan had been made aware of the work of the Chinese physician, Hua Tuo (c140–208), who had experimented with a herbal drink called 'mafeisan' – literally 'cannabis boil powder'. This, he had apparently used to create an anaesthetic state, but the exact constituents remain unclear as all his writings are thought to have been destroyed after his execution in 208. There has been much debate about what mafeisan included, and

suggestions have been made about cannabis, opium, datura, and various other alkaloid containing plants. Hanoaka spent more than 30 years experimenting on his wife and mother-in-law, using a variety of combinations of datura to create unconsciousness, and eventually perfected a combination he called 'mafutsusan'. This contained six plant extracts: datura, aconitum, two forms of angelica, cnidium, and arisaema. After intensive research he created a mixture which had a standard effect, and on 13 October 1804 he produced anaesthesia for the removal of a breast carcinoma.² This was the first confirmed anaesthetic in modern times. Hanoaka went on to teach his method to numerous other surgeons in Japan, and this was the accepted form of anaesthesia until information about ether and chloroform reached Japan.

Manuscripts across Europe and the work done in Japan indicate that forms of herbal anaesthesia were regularly created for many centuries prior to the 'accepted dates' for the introduction of our specialty. It is likely that more and more information will come to light on these matters as the translation and digitalisation of manuscripts and books from Arabic, Indian and Chinese sources continue.

References

- 1 Syndics of Cambridge University Library (MS Dd.6.29, f79r-v).
- 2 Matsuki A. Seishu Hanoaka and his medicine. *Hirosaki University Press*, 2011.



Seishu Hanoaka – picture courtesy of Professor Akitomo Matsuki, Hakodate, Japan