

The
**naked
flame**
and other hot topics

PART 2



Pic 6: Baroque inspired illustration of a gentleman surveying his estate while cups are engaged to his ample buttocks, presumably for sciatic pain. Note the burning material highlighted within the enlarged cup (right).



By Bruce Bentley

In Part 1 of *The Naked Flame* (*The Lantern* Vol. 14:3) the various ways that a flame could be introduced inside a cupping vessel to produce a partial vacuum were explored in the Western medical tradition up until the 7th century AD. In this second installment, after a brief further reflection on cupping's ancient past, the timeline recommences from the Early Medieval Period up to the present day.



Pic 2: Greek forceps from the 3rd and 4th centuries.

THE GREEKS WERE using the element of fire to perform cupping at least as far back as the latter part of the 5th century BC. For classical luminaries, including Hippocrates, Aristotle, Plato, Hero and Strato, the ability of a flame to produce a partial vacuum^a within a hollow space, surrounded and indeed kept in check by a purpose-designed solid instrument, was a philosophical and medical triumph. It not only captured the imagination but also produced such therapeutic effects that the cupping vessel became the emblem identifying the physician, in much same way that the stethoscope does nowadays. From the Greeks onwards, the flame method has been ubiquitous and revered by countless professional and lay practitioners throughout the world.^b

Part 1 presented a survey of the ancient written and archaeological record, together with speculation on other possible procedural scenarios. In this light, throwing a piece of lit material such as flax or lint (linen) into a cup and immediately placing

a. The concept of a fully blown vacuum was abhorrent to the Greeks who called it *horror vacui*.

b. Besides the flame method, other ways to perform cupping have included oral suction to exhaust the air from inside hollow horns, a practice still performed throughout many parts of Africa, the Middle East and Asia, and using liquid to form a partial vacuum, which appears to have been popular with Islamic practitioners around the time of Avicenna (c.980-1037). In China, some practitioners still boil bamboo cups in a herbal mixture, remove and quickly secure them to the body. During the past 200 years, the vacuum pump has joined the ranks of cupping apparatus, and in the last decade, a new innovation has been flexible silicone cupping vessels, where one bends and pulls back the edge of the cup to apply it to the skin surface.



Pic 1: A display of Greek medical instruments, including forceps (circa 3-4 century BC). The bulbous artifact at the back left is a bronze cupping vessel. These tools were only slightly streamlined by the Romans a few centuries later and are remarkably similar to essential modern surgical apparatus.

it onto the skin surface appears to have been the only method of application described. Yet a theory of mine, based in part on the fact that it appears later in history—as we will soon discover—is that a flame from a candle or an oil lamp could also have been employed to perform the task.

Another probability, which I was remiss not to mention in part one, concerns the likelihood of some lint or other burning material being gripped by a pair of forceps and transferred momentarily inside a cupping vessel before being alighted on the skin surface, in the same manner that is commonly performed these days. It is not a long bow to draw, considering the ingenuity of the Greek medical era, alongside the skills of the artisans who designed and made forceps strikingly similar to those employed today. Furthermore, as the medical historian



Pic 3: The dark brown lamp (top) has three crossed markings within the central round shaped recess, known as a discus, and two holes to pour oil inside. It is believed to come from the Balkan region of central Europe and is Eastern Roman/ Byzantine inspired. The museum curator I spoke to at the National Archaeological Museum in Sofia, Bulgaria in 1998 told me the three crossed lines have a Christian meaning and symbolise the Holy Spirit “lighting the way”. She dated this lamp to the 6th – 7th century AD. This is a replica I procured at a nearby market. The (lower) oil lamp, with its elongated open nozzle, is typical of those used during the Moor (Islamic) Period in Spain and Portugal. I brought this replica in Portugal in 2011. Many originals found in Southern Portugal are dated to be from the 11th century.



Pic 4: French illustration of cupping being performed beside a fire: note the wood burning on the ground between the practitioner and patient. It is found in a manuscript with the surrounding text including the word *ventouse*, which means cupping in French. (Dated 1287).



Pic 5: In this lively scene from an early 14th-century illuminated manuscript, a woman appears to be alternating two large cupping vessels to a man's backside—possibly to draw a boil. From the position of her grip on the attached cup, she appears about to release it to make way for a second fast-approaching cup to be placed on the same location. This alternating method, performed by applying one cup, taking it off and immediately reapplying it in a succession of applications, is known as flash cupping in Chinese practice, and in Greek folk-cupping it is performed throughout the back to decongest phlegm from the lungs and withdraw climatic pathogens.

John Kirkup wrote, “the sophistication of surgical instruments indicated in the Hippocratic writings suggests that their ancestry extends further back through the Bronze Age to at least the New Stone Age”^c.

Might I add, the same could be considered with regard to the bronze Greek cupping vessel. Its deliberate design, fulfilling a complex theoretical purpose, suggests it too might have been part of a learning curve that went back in time.

One of the advantages of using a pair of forceps to hold a flame inside a cup is that it allows the measure of heat within a vessel to be precisely calculated to suit each person's treatment requirements. Paulus Aegineta (Welsh, 2007) in his epic medical compendium of the 7th century AD knew as such when he directed that a cup should be applied with “great heat” for certain conditions. To best achieve this requires some

c. Also known as the Neolithic Period, which began around 10,000 BC. Both metal forceps and cupping vessels may have been produced during the Bronze Age, which for the Greeks began around 3000 BC.



Pic 7: Detail featuring a physician using the flame from a candle (in a holder) to apply cups.

lit material to be held by a pair of forceps inside a cup, as the practitioner turns it in his/her hand to ensure a broad heatedness to the interior. I have little doubt that the best Greek and Roman physicians developed a high level of skill in this procedure.

From the 8th century onwards

Since written descriptions about how a flame is brought inside a cupping vessel are rare to find among medical manuscripts from the Medieval Period (the Middle Ages, 5th-15th century), it is fortunate that it was graphically portrayed in numerous works of art. It is fascinating to discover that the flame from both a candle and an oil lamp are commonly featured.

Pictorial evidence from the Medieval Period also lends weight to the assertion made in Part 1 that while we cannot be certain that the flame from an oil lamp or candle played a role in cupping's *modus operandi* during early Greek and Roman times, the likelihood is strong, and further enhanced by the fact that consensus exists among historians

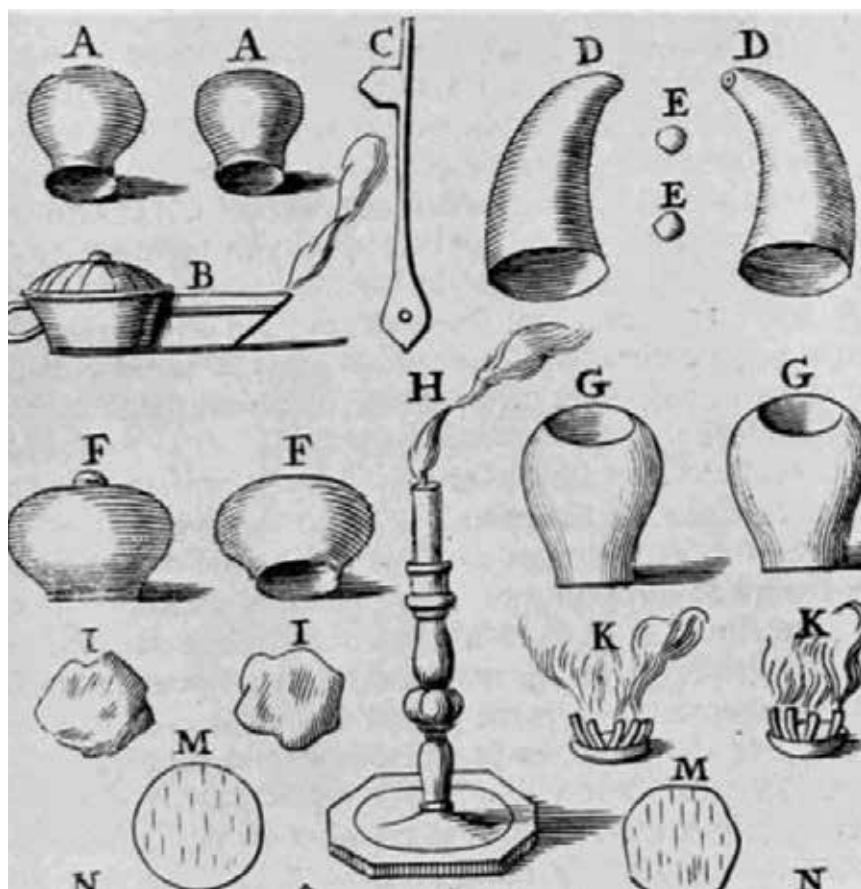
that the ancients well and truly exploited the possibilities of early technologies—and in doing so provided the fundamental precedents for the same activities during the forthcoming centuries—particularly during stages of the Medieval Period when innovation was arguably not so dynamic.

Furthermore, we can surmise that the lack of written description suggests that the means whereby a flame was transported into a cupping vessel had already been established and therefore unnecessary to record. In these pictorial works, other sources for the flame, symbolically at least, include an open fire featured in Pics 4 and 5, and burning material highlighting the need for a flame can be seen within the enlarged the cup in Pic 6 (see first page).

In these illustrations it is gratifying to note, presuming each practitioner is right handed and standing to the left side of the treatment table, that in every instance the lamp or candle is being held in the left hand. I am constantly bewildered to observe or learn of so many people these days performing cupping by



Pic 8: Detail of Paracelsus (presumed) absorbed in his work applying cupping vessels with a lamp. Paracelsus emphasised observation in diagnosis and is credited as the "pioneer of toxicology". This woodcut portrays a relaxed family scene in a sauna or bathing room. Other features include a set of cups stored on the shelf on the back wall. It is noteworthy to observe that both adults have their feet soaking in a tub of hot water. I have seen this practice in Greece and Bulgaria. The footbath warms the body, produces a mild sweat and enables the cups to more effectively draw out pathogens, including toxins. German Renaissance (16th century).



Pic 9. Detail of cupping instruments: A. cups made of horn; B. lamp for exhausting air; C. fleam [a sharp lancet or blade] for making scarifications; D. horns with holes at the tip for mouth suction; E. balls of wax to close the holes in the horn cups; F. G. glass cups; H. candle to light the tow or the small candles; I. tow; K. small candles on a card which is placed over the scarifications and lit in order to exhaust the cup; M. scarifications made for wet cupping.

holding the forceps carrying a flame in their right hands. I can only assume that their learning came from self-instruction or their training was inadequate. The right hand (or vice versa for a left-handed person) should always be the one handling the cup, simply because the subtlety and precision of applying a cup is far more refined than merely inserting a flame into it. The activity of applying a cup should belong to the most adept hand.

Furthermore, doing so also means that the flame can be taken away safely outside the range of the patient's body, rather than having it linger above it, as is the case if the left hand is performing the task. Secondly, it is probably a confidence issue in thinking that the more competent hand should be the one holding and managing the flame. However, in my many years of teaching cupping, it is never a problem for people to make the change to holding and inserting a flame with their less dominant hand; it is a simple procedure of which any left hand is capable. By making this adjustment, in every case the student quickly learns it is more efficient, effective and, most importantly, safe.

The lamp and the torch

Little occurred in the way of change to cupping apparatus until the latter part of the 18th century and into the 19th. With the advent of the Industrial Revolution (1790–1870), a flurry of new cupping devices emerged on the market, especially new versions of the vacuum pump. It appears that many would-be inventors were focused on impressing consumers with models based on a principle of “the more complicated the better”. Never to let an opportunity slip, patents were taken out on an assortment of new designs ranging from the worthwhile to the bewildering.⁴

New tools supplying the flame, however, were more staid. The two that made a big impact, and developed on from the 18th century brass grease lamp with a cover to regulate the flame, were the medically oriented bronze alcohol lamp of the 1790s with its thick woven wick, and the “cupping torch”. For the prospective buyer, be they a doctor, professional cupper or dedicated lay person, deciding which flame device to go for appears to have been a major decision when deciding on a cupping box, which offered protection for such delicate equipment.



Pic 10: A metal lamp and cover alongside a variety of different shaped and sized cupping vessels (1781)

d. The story of 19th century attempts to improve cupping technology is interesting, as a great deal of effort was spent for relatively short-lived advantages. The 1800s heralded the virtual end of bloodletting, being phlebotomy, venesection and wet cupping, yet in its wake doctors for example embraced a renewed interest in (dry) cupping, if only briefly until the 1880s when they switched their allegiance to the emerging science model and pharmaceutical industry. With the intention to secure medical dominance, the medical fraternity then began a campaign to discredit cupping, even though only 50 years earlier Thomas Wakely, founder and editor of the medical journal *The Lancet*, had sung its praises and recommended that medical students learn how to perform it.



Pic 11: A wooden cupping box lined with velvet and including a brass spirit lamp. Made by Savigny of London, late 18th to early 19th century. Medical almanacs advertised a variety of different models of cupping boxes. The top of the range was made of finely polished mahogany or rosewood and lined with red felt or velvet. Each box usually contained two or three glass cups, a spring scarificator to incise the skin for wet cupping, a jar of smelling salts (to revive the patient if required) and either a brass lamp or a cupping torch.



Pic 12: Cupping instruments as described in pic 11. Made by Savigny of London.

Best practice and 'rudimentary' methods

Thomas Mapleton, "Copper to His Majesty" no less, considered that the most effective and safest passage for the flame was an essential part of "best practice". While he held the torch in high regard, for him and for many other cuppers he knew, "the more common, more commodious, and more speedy method of rarefying the air in a cupping glass is by the momentary introduction of the flame of a spirit lamp" (183:82).

While Mapleton preferred to use a lamp, some other cuppers were particularly keen on the torch. Samuel Bayfield, for example, author of *A Treatise on Practical Cupping* (1839) considered the torch to be one of the better new innovations. He described it as "a cylindrical tube of brass or silver, three inches and three quarters in length, half an inch in diameter". Cotton is stuffed inside with "about half an inch projecting from the end of the tube". The end was then dipped in spirit before lighting. G.F. Knox (1831:340) agrees: "The torch is the simplest and decidedly best instrument for exhausting the glasses," and Dr Charles Kennedy (1826:13) makes the self explanatory point when comparing these instruments with the variety of other sophisticated methods by saying, "but abler hands prefer the mode of introducing the torch or spirit lamp".



Pic 13: A leather-bound cupping case with a cupping torch and cover on the left. London, 1801-1900.

In their sweeping survey of the bloodletting equipment housed at the Smithsonian Institution, Washington DC, Appel and Toby (1979:21) described the torch as “more convenient than the older teapot lamp because it was easier to insert into the cup, and was small enough to hold in the hand at the same time as one held the scarificator when performing wet cupping.” If this was the main advantage, then the use of the torch may have lost ground when interest in wet cupping waned from the 1850s onwards.^e

e. The demise of bloodletting was no doubt aided by the “heroic cure” practices carried out by Benjamin Rush (1745-1813), an American medical doctor, and his enthusiastic fellow physicians who performed excessive regimens on their patients. George Washington was one of many who succumbed the same day after receiving a series of copious bloodlettings from his doctor. One needs to appreciate the fact that apart from Rush and his influential branch of the Western medical fraternity, there is no evidence that ties any traditional or folk medical practices of the time to such overzealous practice. It is indeed ironic therefore that modern biomedicine declares “thank goodness practices like blood-letting are no longer the norm” when in fact its own members took it to the degree that it became (to this day) a critical scoring point against “the practices of the past”.

In my opinion the cupping torch was on the right track because as a thinner more maneuverable device, it can be held easily within a cup and has the same advantage to the even more preferable approach of wrapping cotton wool around the tip of a pair of medical forceps. To date I have been unable to discover the date and origin of this practice in relation to cupping. It could well be that the current common practice of using forceps (my recommendation is 6 inch/15 cm sponge forceps) has carried over from its practice in hospitals in the United Kingdom and Europe until its demise following World War II. The modern Chinese cupping practice of using forceps to hold a wad of lit cotton wool has also no doubt been a contributory influence. Having said this, although definitely not using expensive forceps, in numerous European folk medical settings I have watched people wrapping cotton wool or material around a kitchen fork or a piece of wire curled at the end to secure it. These lay practitioners have assured me that this way of inserting a flame into a cup goes back several generations.

How does a flame cause a partial vacuum inside a vessel?

According to the literature of the 19th century, a flame or heat within a cupping vessel “rarefied” the air and enabled suction to occur (Sargent 1862, 259). From a current perspective, how does the introduction of a flame into a hollow space cause a partial vacuum?

It is popularly believed that the vacuum achieved by inserting and then withdrawing a flame from a cupping vessel is brought about by oxygen being consumed. This is incorrect. “Burnt” oxygen turns into carbon dioxide, which does not diminish the molecular mass inside the cup. It is all to do with the heat of a fire inside an enclosed space. A partial vacuum is achieved in the following way: The atmosphere inside a cup, as it is on the outside, is relatively stable. However when intense heat is introduced, the atmosphere expands and



the regular neutral order is thrown into an active frenzy. This causes the molecules, a mix of oxygen, nitrogen, carbon dioxide and a small amount of other gases, to become excited, expand, and move away from each other; making their volume no longer able to be contained in a small space. This pressure then causes a portion to exit the cup. As a consequence, a

partial vacuum, or an amount of free space, is momentarily created. As the heat inside dies down, the molecules will resume their regular order and thereafter suction is lost.

In practical terms, the strength or level of the vacuum inside a cup depends on the time taken between a flame being removed and the cup being sealed on the body. It depends on a cooling down process. If the application is performed quickly, the suction will be strong. If a few seconds are allowed to pass, the pull will be soft. In physics this phenomenon belongs to the Ideal Gas Law.

The formula is: $PV=nRT$,
 P = pressure
 V = volume
 n = number of moles (concentration) of gas
 R = ideal gas constant
 T = temperature

During the 19th century other more rudimentary methods enabling the fire element to achieve a partial vacuum were also being practised, and physicians in their correspondences to the British medical journal *The Lancet* shared some of these. J.H. Roberts MD, for example, after extolling the virtues of cupping went on to describe his practice of “throwing a very minute lighted bit of paper touched with ether or turpentine into a large glass or tumbler”. This technique is still common in Chinese folk cupping but regrettably can lead to burns. Spencer L. Rogers PhD (1985:21), a professor of anthropology mentioned this when he conveyed the sentiments of professional cuppers (not surgeons) who “vehemently disapprove of this as being clumsy because the patient could be easily scorched”.

Another method was described by F. W. Sargent MD (1862:259): “The inner surface of the cup be moistened with spirits of wine, which should then be inflamed, and while the vessel is yet warm, should be placed upon the skin.” In most cases, provided diligence is exercised, this method can be effective and relatively safe. Yet for Bayfield (1839:125), even the faint possibility of burning a patient was “reprehensible”. He considered these simple exhaustion methods to be “clumsy expedients” and preferred a lamp or torch especially “made for cupping”. Needless to say, another method that would have made Bayfield, Mapleton and co. grimace was described in *A System of Medicine* by the physicians Latham and English (1914:35) who wrote, “small pieces of blotting paper be picked up with a needle and dipped in methylated spirit and then into a spirit lamp and while burning dropped into the glass, which is immediately inverted over the part to be cupped”—harking back to Hippocratic times.

So while we are reminded that history repeats itself, there are always highlights in time, such as the efforts of those largely unheralded professional cuppers of the 19th century in the Western tradition who were passionate to see the practice prosper.

In Part 3, I will discuss the flame’s role in cupping from scholarly Chinese, Indian and Middle Eastern perspectives, as well as from various folk traditions.

Bibliography

- Bayfield, Samuel (1839) *A Treatise on Practical Cupping*. Joseph Butler. London.
- Davis, Audrey and Appel, Toby (1979) *Bloodletting Instruments in the National Museum of History and Technology*, Washington DC Smithsonian Studies in History and Technology. Smithsonian Institution Press. USA
- Kirkup, J. R. (1981) The history and evolution of surgical instruments. *Annals of the Royal College of Surgeons of England*. Vol. 63. Pp 279 -286.
- Kennedy, Charles ((1826) *An Essay on Cupping*. Jackson. London.
- Knox, G. F. (1931) The Art of Cupping; A brief history of its operation, its utility, minute rules for its performance. *The Lancet* (1830-31). Ed. Thomas Wakely. Vol.2. Mills, Jowlett and Mills. London.
- Latham, Arthur and English, T. C. (eds) (1914) *A System of Treatment: in Four Volumes. Vol. 1. General Medicine and Surgery*. The MacMillan Company. Great Britain.
- Mapleton, Thomas (1830) *A Treatise on the Art of Cupping*. John Wilson. London.
- Roberts, J.H. 1932-3:526) On Dry Cupping with cases. Correspondence in *The Lancet* (ed. Thomas Wakely). Vol.1. Mills, Jowett and Mills. London.
- Rogers, Spencer L. (1985) *Primitive Surgery; skills before science*. Charles C Thomas. USA.
- Sargent, F.W (1862) *On Bandaging and other Operations of Minor Surgery*. Blanchard and Lea. Philadelphia.
- Welsh, J. (2007) *The Medical Works of Paulus Aegineta. Vol.2*. Treuttel, Wurtz, & Co. London.

Pictorial credits

1. Archeological Museum, Athens, April 11, 2013. Photograph by Bruce Bentley
2. Archeological Museum, Athens, April 11, 2013. Photograph by Bruce Bentley.
3. Photograph by Bruce Bentley. Personal collection.
4. Aldobrandino da Siena (d. 1287) *Le regime du corps*, British Library. From the Iconographic Collection: Wellcome Institute Library, London. Ref: M0007010B00.
5. Wellcome Institute Library, London. Ref: M001187B00.
6. Dekkers, Frederick (1648-1720), *Excitationes practicae, Leiden: J. Luchtman and C. Boutesteyn*. Wellcome Institute Library, London. Ref: L0002320B00.
7. Wellcome Institute Library, London. Ref: V0016800B00.
8. *ibid.* Ref: M0010164B00 Lechler (1565:228) Paracelsus, *Opus Chirurgicum*. Frankfurt. Artist: Jost Amman, c1565.
9. Pierre Dionis, *Cours d’operations de chirurgie demontrees au Jardin Royal, Paris, 1708*. Photo courtesy of NLM. In Davis, Audrey and Appel, Toby (1979:76) *Bloodletting Instruments in the National. Museum of History and Technology*, Washington DC. Smithsonian Studies in History and Technology. Smithsonian Institution Press, USA.
10. Koelbing, Huldrych M. (1937) *Storia Della Therapia Medica: Momenti fondamentali, 1937*. Biba-Geigy Edizioni. Plate 27, conceived by Johann Alexander Brambilla, Vienna 1781.
11. Wellcome Institute Library, London. Ref: M0019450B00.
12. *ibid.* Ref: M0019451B00.
13. Science Museum Group Collection, London.
14. Natural History Museum, London. Photograph by Bruce Bentley, 1998.

■ Bruce Bentley is a Australian registered acupuncturist and Chinese herbalist who presents cupping and gua sha workshops. He is also an editor for WHO in the division of Traditional, Complementary and Alternative Medicine, and is president of World Ethnomedicine Foundation (WEF).
 ■ www.healthtraditions.com.au
 ■ Facebook/Healthtraditions.