

A Survey of Symbols of Medicine and Veterinary Medicine

**Paper presented by Bruce Grainger, Macdonald Campus Library, McGill University
at the Third International Conference of Animal Health Information Specialists (Session 6)
Eighth International Congress on Medical Librarianship (Parallel 7, Session 4)
July 5, 2000 - London, England**

The traditional symbol of medicine from ancient Greek times to the present has been the staff of Asclepius (various spellings include the Latin Aesculapius and the Greek Asklepios) - (Slides 1, 2). In more recent times, the caduceus or magic rod of the Greek god Hermes (whose Roman equivalent was Mercury) has also been used as a medical symbol although its use for this purpose has often been criticized (Slide 3).

Asclepius was the Greek god of medicine, born of the nymph Coronis and of Apollo, the god of light, truth, and prophecy. He was taught the art of healing by the centaur Chiron (also spelled Cheiron) - (Slide 4) - but having displeased Zeus, the king of the gods, by bringing back to life those Zeus had specifically condemned to death, he was killed by Zeus' thunderbolt. Originally, as described in Homer's Iliad, he was simply a skillful physician; only later in Thessaly did he become worshipped as a god. As the cult spread throughout Greece, temples were erected in his honour and cures were effected by sleeping in them. The worship of Asclepius spread to Rome and his adherents remained an important rival to Christ (who was also represented as physician and healer) in the first and second centuries A.D. Worship of Asclepius continued as late as the sixth century.¹

Asclepius was frequently represented standing, dressed in a long cloak, chest bared and holding a staff with a single snake encircling a staff, classically a rough-hewn knotty tree limb.² By contrast, the caduceus is described as "a short rod entwined by two snakes and topped by a pair of wings".³ In Greek mythology the caduceus was the magic rod of Hermes, the messenger of the gods, and the god of wealth, of trade and travellers, of commerce, of manual skill, of oratory and eloquence, of thieves, of the wind and patron of athletes.⁴ In his study of the caduceus as a symbol of medicine, Friedlander attributes its use as a medical symbol in part as due to its simply being confused with the single snake staff of Asclepius. That Hermes was also the god of thieves has not escaped the comment of modern critics of organized medicine.

The snake or serpent is an extremely common symbol found in many cultures. Friedlander points out that serpent cults can be traced to certain American tribes such as the Apaches, Seminoles, and Navahoes, the Brassmen of Niger in Africa, the Nagas of India, and the Druids at Stonehenge in England.⁵ Friedlander cautions against the explanation that the widespread occurrence of the serpent symbol in many cultures must of necessity be derived from a common source. He suggests that the reason why “different groups of people have come to use the same symbol or imagery is that there is a commonality among men in the conceptualization of symbols which has been arrived at independently”.⁶ Serpent imagery occurred in pre-Columbian Central America, in Melanesia, as well as Assyria, Phoenicia, and ancient Greece and Rome. Furthermore, “references to the serpent in Buddhism, Jainism, Sikhism, Judaism, and Christianity emphasized the great importance attached to this reptile”.⁷

Among the characteristics attributed to snakes have been fertility; immortality, thus a relationship to health and medicine; wisdom, both in the sense of possessing knowledge as well as being prudent; prophecy; evilness as when the serpent tempted Eve; goodness and good fortune; the bearers of men’s souls; great physical strength and rapidity of movement; and creatures of the underworld.⁸

The serpent has represented two directly opposed ideas, one as the foe of mankind and the symbol of evil, and secondly as man’s protector and saviour in disease and distress. In the Old Testament of the Bible, the serpent is the tempter of Eve and is cursed as the enemy of mankind (Genesis 3:1-16) – (Slides 5, 6). The ancient Israelites also knew the “serpent of brass” made by Moses as a cure for snake-bite (Numbers 21:9)⁹ – (Slide 7). These two contradictory roles attributed to the serpent derive from the ancient idea of the serpent as the “embodiment of the mystery of the one absolute life of the earth, which entails a continual dying and resurrection”.¹⁰

Asclepius’ serpent, which coiled around a staff symbolizes medicine to this day, was “the snake whose home was deep down in the underworld, where [Asclepius] himself dwelt because, according to the ancient view, it was precisely in the realm of the dead that the mystery of life and of recovery lay hidden”. The

serpent represented the totality of life, that is, “life dying and rising from the dead”. Thus the serpent was sometimes cursed as the arch-enemy of man and sometimes venerated as a powerful and divine saviour.¹¹

The rod or staff is itself a symbol of resurrection and thus of healing. The rod was often portrayed as a rough or gnarled branch, sometimes with leaves intact. Its vegetative origin symbolized the mystery of plant growth and the living earth, and embodied both death and resurrection. The staff of Asclepius was seen by the ancients as a magic wand. The serpent and staff were first seen as separate entities with regard to their association with Asclepius. In time, as representations of the living earth, the coiled serpent around a staff were united into one symbol as the rod and serpent or staff of Asclepius.¹²

Other symbols associated with Asclepius are the cock, omphalos (navel of the world), scroll, bloodletter trocar, and various vegetable attributes such as the cypress, palm twig and bunch of grapes¹³ (Slide 8). Also associated with Asclepius was his daughter and principal helper, Hygieia¹⁴ who added the aspect of preventive medicine to Asclepius’ task as a physician¹⁵ (Slide 9).

Knowledge of Asclepius and his rod and serpent persisted throughout the Middle Ages but during this time the emblem did not represent medicine. The rise of Humanism and the desire to promote classical values played a part in the modern development of the rod and serpent as a symbol of medicine. The more important cause for the re-adoption of the Asclepian staff as a medical symbol was the widespread familiarity with the related Brass Serpent of Moses which was a familiar image during the Middle Ages.¹⁶

During the 15th and 16th centuries, the growing respect for the classical heritage of the West led to the replacement of St. Cosmas and St. Damian as patron saints of physicians and apothecaries by the ancient Greek god of healing, Asclepius. After the Protestant Reformation, Asclepius and his attributes were deliberately substituted for the Catholic patron saints.¹⁷

From the early 16th century onwards, the staff of Asclepius and the caduceus of Hermes were widely used as printers' marks especially as frontispieces to pharmacopoeias in the 17th and 18th centuries.¹⁸ Over time Asclepius, the Greek god of medicine, and the various related figures and symbols associated with him, became separated from the rod and serpent as a representation of health and medicine. Gradually the Asclepian staff emerged as an independent symbol of medicine.¹⁹

In 1954, the 10th General Assembly of the World Medical Association held in Havana, adopted a medical symbol for use as protection for civilian doctors, their assistants and medical civil defence units which were not protected by the Red Cross under the Fourth Geneva Convention. "The emblem is a red, straight, vertical stick and a serpent represented by a sinuous line over the stick with two undulations on the left side and one undulation on the right side displayed on a white field"²⁰ (Slide 10).

Despite the unequivocal claim of the staff of Asclepius to represent medicine (and healing), the caduceus, a rod with two entwined serpents topped by a pair of wings appears to be the more popular symbol of medicine in the United States. Friedlander attributes this popularity of the caduceus to simple confusion with the staff of Asclepius, the true symbol of medicine. He notes that "many people... have used the word caduceus and the staff of Asclepius, or have used the word caduceus to mean both of these emblems".²¹

Originally, the wand caduceus referred to a nonspecific herald's wand but for the purposes of this discussion the caduceus will refer to that of Hermes (the Greek god known as Mercury by the Romans) with two entwined snakes encircling a rod and topped by twin wings. According to mythology, Hermes threw his magic wand between two fighting snakes. The serpents then ceased fighting and wound themselves around his wand. Although the actual origin of the caduceus is unknown, the two most common explanations are that it derived from a representation of the Babylonian god Ningizzidia (Slide 11) and secondly, that it developed from a shepherd's crook that was forked on top.²² An antecedent to the caduceus was a figure-eight shaped symbol on top of a rod with the top loop open (Slide 12). Later, the figure-eight became entwined serpents.²³

The earliest example of the figure-eight with snakes is from the 5th century B.C. The oldest caduceus with wings is believed to date from the first century A.D., although statues as early as the fourth century B.C. (now destroyed) may have represented this symbol. Not until the 15th century was the caduceus with snakes commonly shown with wings²⁴ (Slide 13).

The link between Hermes and his caduceus and medicine seems to have arisen because by the seventh century A.D., Hermes had come to be linked with alchemy. Alchemists were referred to as the sons of Hermes, as Hermetists or Hermeticists and as “practitioners of the hermetic arts”.²⁵ From ancient times, sulphur and mercury had been regarded as the constituents of all matter in the view of the alchemists, and Hermes or Mercury, as the god was known to the Romans, was considered the father of alchemy. By the end of the sixteenth century, there was an established connection between Hermes and his caduceus with medicine by way of alchemy. At this time, the study of alchemy included not only medicine and pharmaceuticals but chemistry, mining and metallurgy.²⁶ At later times the caduceus was used as the sign of merchants and commerce because Hermes was the god of the agora or marketplace. Other attributes of Hermes-Mercury such as peace and eloquence led some lawyers and poets to use the caduceus as their emblems. The caduceus was also used as a symbol of wisdom regardless of the occupation being represented.²⁷

Despite learned opinion that it is the single snake staff of Asclepius that is the proper symbol of medicine, many medical groups have adopted the twin serpent caduceus of Hermes or Mercury as a medical symbol during the nineteenth and twentieth centuries. A notable example is the purchase in 1874 by the Royal College of Physicians of Edinburgh of a caduceus that is kept outside the door of their hall and is used at College receptions (Slide 14). The symbol of the caduceus was also incorporated into the coats of arms of two prominent English doctors who were knighted: Sir George Burrows in 1874 and Sir William Broadbent in 1893. The seal of the Minnesota Medical Society incorporated a caduceus which was displayed on the cover of the Society's *Transactions* as early as 1871. A statue completed in 1860 and said to represent Hippocrates in the Oxford University Museum includes a caduceus. The office building completed by the American

Medical Association in 1902 incorporates a sculpted caduceus on either side of the front entrance and also had this symbol on the glass door of this entrance.²⁸

Like the staff of Asclepius, the caduceus became associated with medicine through its use as a printer's mark. Although the noted Basel printer Johann Froben used the caduceus as a printer's mark, the medical books that he published were done long after he had adopted this mark²⁹ (Slide 15). The use of the mark seems to be more an association with Mercury as the messenger of the ancient gods, given that printers saw themselves as messengers of the printed word and diffusers of knowledge. Many English newspapers of the 17th and 18th centuries incorporated Mercury within their name.³⁰ John Churchill, a prominent London publisher of medical texts began to use the caduceus as a printer's mark as early as 1838.³¹ Although other contemporary British publishers did not follow Churchill's example, many American medical publishers, most notably the antecedents of Lea and Febiger, did³² (Slide 16).

A major reason for the current popularity of the caduceus as a medical symbol was its official adoption as the insignia for the Medical Department of the United States Army in 1902 (Slide 17). In this case, the caduceus has a second meaning as a symbol of peace described as such as early as the Greek, Thucydides in his *History of the Peloponnesian War* (431- 404 B.C.) and used by the Romans in their war with Carthage. Sending the caduceus to an enemy was also used as a threat to demand surrender which would lead to peace.³³

The use of the caduceus as an allegory for peace from the seventeenth century onwards is demonstrated in various commemorative medallions and coats of arms. The earliest use of the symbol by the United States Army was in 1851 when it was incorporated into a chevron worn by hospital stewards, who could be considered as noncombatants performing a peaceful function. This chevron was used until substituted by a "red cross" in 1887.³⁴

In 1871, the United States Marine Hospital Service adopted an insignia which included the caduceus of Mercury. This particular use of the symbol has been justified “because of its relationship with merchant seamen and the maritime industry”.³⁵

Friedlander suggests that confusion between the rod and serpent of Asclepius and the caduceus of Mercury was created by French military personnel who adopted the Asclepian staff in 1798 but began calling it a caduceus. A French medical periodical published from 1901 to 1920 was entitled *Le Caducée: Journal de chirurgie & de médecine d’armée*. A symbol on the journal’s banner more closely resembles the Asclepian staff than a caduceus³⁶ (Slide 18). However, this use of the word “caducée” is not surprising given that *Harrap’s*, a major French-English dictionary, translates the word firstly as “caduceus”, and secondly as “Aesculapius’s staff”.

Other military medical organizations which have adopted the caduceus include the Royal Air Force in 1919, followed by Korea, Paraguay, Iran, and Luxembourg which in 1962 changed to the staff of Asclepius.³⁷

Although the American Medical Association officially adopted the staff of Asclepius as their official seal in 1910, illustrations subsequently published in the *Journal of the American Medical Association* for many years afterwards are that of the caduceus, indicating an apparent continuing confusion of the symbols.³⁸ Friedlander surveyed 242 logos or insignias of American organizations relating to health or medicine in which the caduceus or staff of Asclepius formed an integral part dating from the late 1970s to early 1980s. He found that professional associations were more likely to use the staff of Asclepius (62%) while commercial organizations were more likely to use the caduceus (76%). The exception is for hospitals, where only 37% used a staff of Asclepius versus 63% for the caduceus. Friedlander notes that while the prevalent use of the caduceus for the commercial aspects of medicine might be seen as “more-or-less appropriate”, he thinks the reason is that professional associations are more likely to have a real understanding of the two symbols,

whereas commercial organizations are more likely to be concerned with the visual impact a symbol will have in selling their products.³⁹

Veterinary medicine traces its symbolic representation to the half-man, half-horse creatures in classical Greek mythology known as centaurs. In general, centaurs were known as uncouth, fierce, lustful and brawling creatures whose bad behaviour frequently led to death. The exceptional and “good” centaur was Chiron (also spelled Cheiron) born of a brief liaison between Cronus and the sea nymph Philyra.⁴¹ Chiron was widely acclaimed for his wisdom and was taught the healing arts by Apollo and Artemis. In turn, Chiron became the great teacher of many Greek heroes and gods, including Asclepius.⁴² Chiron the Centaur has been adopted in the insignia of veterinary groups throughout the world. As “half-man, half-beast, he symbolizes the concept that attention to the welfare of animals has been a proper concern of mankind from ancient times to the present”⁴³ (Slide 19).

My presentation has focussed on the two traditionally competing symbols of medicine widely used around the world. There are of course thousands of symbols of every description used by professional associations and private business organizations.

The following symbols are primarily representative of professional medical and veterinary medical associations.

1. *Encyclopedia Britannica I Micropaedia* 1981 p.572
2. *Ibid.*
3. Friedlander, Walter J. *The Golden Wand of Medicine: A History of the Caduceus Symbol in Medicine.* New York, Greenwood, 1992 p.1
4. Zimmerman, J.E. *Dictionary of Classical Mythology.* New York, Bantam, 1964 p.124 as cited by Friedlander p.1
5. Friedlander, p.13-14
6. *Ibid.*, p.13
7. *Ibid.*, p.14
8. *Ibid.*, p.15
9. Schouten, J. *The Rod and Serpent of Asklepios: Symbol of Medicine.* Amsterdam, Elsevier, 1967 p.1
10. *Ibid.*, p.2
11. *Ibid.*, p.37
12. *Ibid.*, p.41
13. *Ibid.*, p.45-48
14. *Ibid.*, p.52
15. *Ibid.*, p.57
16. *Ibid.*, p.106

17. *Ibid.*, p.133-134
18. *Ibid.*, p.171
19. *Ibid.*, p.191-192
20. *Ibid.*, p.6
21. Friedlander, p.7-8
22. *Ibid.*, p.17
23. *Ibid.*, p.19
24. *Ibid.*, p.27
25. *Ibid.*, p.74
26. *Ibid.*, p.76-77
27. *Ibid.*, p.85-86
28. *Ibid.*, p.98-100
29. *Ibid.*, p.110
30. *Ibid.*, p.111
31. *Ibid.*, p.113-114
32. *Ibid.*, p.118
33. *Ibid.*, p.128

34. *Ibid.*, p.128-129
35. Williams, R.C. *The United States Public Health Service, 1798-1950*. Washington, DC: Commissioned Officers Association of the United States Public Health Service, 1951 p.517 as cited by Friedlander p.130-131
36. Friedlander, p.137-139
37. *Ibid.*, p.145-146
38. *Ibid.*, p.146
39. *Ibid.*, p.153
40. Miller, Everett B. *United States Army Veterinary Service in World War II*. Washington, DC, Surgeon-General's Office, 1961 p.24
41. *Ibid.*, p.25
42. *Ibid.*, p.27
43. Smithcors, J.F. Chiron, Apsyrtus and Carlo Ruini: Veterinary Medicine from Mythology to the Nuclear Age, *Modern Veterinary Practice*, 59(6) June 1978 p.433

Sources for Slide Illustrations

British Veterinary Association Annual Report, 1998-99, 28pp.

Friedlander, Walter J. *The Golden Wand of Medicine: A History of the Caduceus Symbol in Medicine*. New York, Greenwood, 1982, 181pp.

Dunlop, Robert H. and David J. Williams *Veterinary Medicine: An Illustrated History*. St. Louis, Mosby, 1996, 692pp.

Katic, Ivan *World Atlas of Veterinary Emblems*. Copenhagen, Veterinaerhistorisk Forskning, 1987, 118pp.

Katic, Ivan *World Atlas of Veterinary Emblems - Supplementum 2*. Copenhagen, Veterinaerhistorisk Forskning, 1990, 32pp.

Miller, Everett B. *United States Army Veterinary Service in World War II*. Washington, Surgeon-General's Office, 1961, 779pp.

Potter, Edwin S. *Serpents in Symbolism, Art, and Medicine: the Babylonian Caduceus and Aesculapian Club*. Santa Barbara, California, Privately Printed, 1937, 85pp.

Carlsson, Johnny M. and Anna Gjerluf Eslau editors *Animal Health Information: Structuring and Sharing, Global and Local. Proceedings of the Second International Conference of Animal Health Information Specialists July 1-4, 1997*. Frederiksberg (Copenhagen), Denmark, 1998, 120pp.

Schoenmakers, Ton and Joren Jas *Slang, Esculaap en Gaper: medisch-Farmaceutische Symbolen*. Mijdrecht, Roche Nederland, 1993, 173pp.

Schouten, J. *The Rod and Serpent of Asklepios: Symbol of Medicine*. Amsterdam, Elsevier, 1967, 260pp.

Smithcors, J.F. Chiron, Apsyrtyus and Carlo Ruini: Veterinary Medicine from Mythology to the Nuclear Age, *Modern Veterinary Practice*, 59(6) June 1978, p.433-436

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- Mercury; Giovanni Bologna 1564-80;
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British Medical Association; <http://www.bma.org.uk/press/press.htm> (June 2000)

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International Council of Nurses; <http://www.icn.ch/> (June 2000)

International Hospital Federation; <http://www.ihf.co.uk/default2.htm> (June 2000)

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World Medical Health Association; <http://www.wma.net/e/home.html/> (June 2000)

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European Society of Feline Medicine; <http://www.fabcats.org/esfm.html> (June 2000)

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Association of Veterinarians in Industry; British Veterinary Association Annual Report 1998-
99, p.25

Royal College of Veterinary Surgeons; <http://www.rcvs.org.uk/reference/history.html> (June
2000)

Colegio de Medicos Veterinarios del Estado Apure, San Fernando de Pure, Venezuela; Katic,
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World Small Animal Veterinary Association; <http://www.wsava.org/index.htm> (June 2000)

Veterinary Medical Libraries Section of the Medical Library Association; Carlsson, Johnny M.
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