

***The Tools Of Asclepius* [Surgical Instruments In Greek And Roman Times]
Summary of a presentation made to
The Northwest Society for Classical Studies
by Lawrence “Larry” J. Bliquez, Ph.D.,
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**Summary prepared by Michael McGoodwin (M.D.)
incorporating corrections provided by Professor Bliquez**

The Northwest Society for Classical Studies (NWCS) was honored and privileged to have Professor Larry Bliquez speak on one of his favorite topics, the surgical instruments found in classical archeological sites and described in classical literature. Professor Bliquez is a distinguished and popular University of Washington professor, trained in classical (Latin and Greek) philology, winner of the Distinguished Teaching Award in 1998, and President of the Society for Ancient Medicine¹. The meeting, held on a Saturday night in a classroom in Denny Hall, was well attended by members of the NWCS as well as by numerous guests, including some physicians and others interested in medical history. This was an enjoyable presentation given by an enthusiastic and animated lecturer.

The following summary is made from notes I recorded at that meeting. For clarity, I have expanded a little on classical references he made, using the *Oxford Companion of Classical Literature* (1989), *Dorland's Medical Dictionary 27th Edition*, and various web sources. My interpolations from other sources and my own interpretations are generally indicated in square brackets. Disclaimer: I am not a surgeon, I claim no special knowledge of ancient medicine, and I have neither Latin nor Greek. Professor Bliquez has graciously looked over this summary and offered some corrections, but I claim responsibility for any errors that remain.

Textual Sources for Medical Instruments and Procedures

The textual sources which he has used in pursuing this interest include:

(1) The Hippocratic Corpus. This is an extensive body of some 60 treatises customarily attributed to Hippocrates (born on the island of Cos c. 460, died c. 370) or to his followers. The collection is thought to date in part as far back as the late 5th century BCE according to Professor Bliquez, and was assembled up to as late as the third century BCE. [According to *The Oxford Companion*, this collection may have in fact been the medical library of a Greek school of medicine located at the shrine of the mythical god of healing Asclepius/Asklepios/Aesculapius on Cos.]

(2) Celsus [Aulus/Aurelius Cornelius Celsus], a Roman Latin encyclopedist and contemporary of emperor Nero (37-68 CE). [*The Oxford Companion* also mentions that he was a also contemporary of emperor Tiberius, 14-37 CE. His encyclopedia *Artes* included eight books on medicine, and became popular starting in the 15th century when it was reprinted].

(3) Galen/Galenus of Pergamum/Pergamon [129 - 199 CE], a highly influential Greek physician and contemporary of emperors Marcus Aurelius, his son Commodus, and Septimius/Septimus Severus.

(4) Oribasius of Pergamum/Pergamon. [c. 325-403 CE. “Oribasius ... has been unfairly neglected by classical scholars. Physician to the emperor Julian [“the Apostate” 360 - 363], he and his works occupy a pivotal position in the development of the literary medical tradition in antiquity. With the *Medical Compilations*, Oribasius founds an important new genre of medical writing: the encyclopaedia,

a single work purporting to encompass all the knowledge most useful for the goal of medicine, as selected from the treatises of the best physicians. Foremost amongst these is Galen, who provides both the theoretical framework for the collection and the bulk of the material collected. This foundation, therefore, marks a key stage in the triumph of Galenism in the Greek East of the Roman Empire.” (Excerpted from a book review on the Web)^{2]}

(5) Other early Byzantine sources including Aetius of Amida, a contemporary of emperor Justinian [527-565 CE], and Paul of Aegina (who flourished in the 7C).

Archeological Sites for Medical Instruments

The sites Bliquez mentioned from which the most medical artifacts derive are doctor’s graves and settlement sites in the Roman empire (there are apparently few artifacts deposited in classical Greek times). These sites include the “Vesuvian” cities of Pompeii and Herculaneum, both destroyed 79 AD by the Vesuvian eruption, and a Roman empire site in Germany near Bingen and Mainz. The Pompeii site(s) include one of a surgeon who was probably a Greek, presumably not high in the social hierarchy though respected as a member of a learned profession, either a slave of a Roman citizen or an independent practitioner, possibly part-time.

One of the best collections of authentic surgical instruments is held at the Johns Hopkins University Institute of the History of Medicine (1900 E. Monument Street, Baltimore).

General Medical Environment in Ancient Times

In Greek the physician was termed “iatros” = “doctor”. By the time of the Roman empire, Bliquez states there were 110 different surgical procedures routinely performed, for the most part through orifices of the body or superficially on the body surface. These included highly sophisticated procedures such as mastectomy which are still performed today. Most of the instruments in use then are readily recognizable to the modern surgeon and had considerable empirical practical utility. The word surgery comes from the Greek “cheirourgia” = “to work with the hand” [Latin “chirurgia”]. In general, surgery was performed with some type of analgesia such as opium or other mind-numbing substances [I did not catch the names he gave for certain plant extracts or “banes”]. The good surgeons operated quickly! There was no understanding then about the nature of infection or of antiseptic technique—in fact, pus and suppuration were apparently not always regarded as undesirable and could be “noble”. There was no concept of malpractice (unlike the earlier and somewhat infelicitous Code of Hammurabi³), but physicians could be prosecuted for homicide, and it was expected that specialized procedures should be performed by specialists. However, some writers such as Pliny the Elder held Greeks in general and physicians in particular in great contempt. Pliny said they were argumentative and were the only ones who could get away with murder.

Instruments and Procedures

The handles and bodies of instruments were usually made of copper alloys, bronze or brass. In contrast, the business end, such as the blade of a scalpel, was unusually made of steel and was replaceable—the blade fit into a slot at the end of the handle. These steel components have therefore rusted away in most specimens. The copper alloy handles and bodies are truly works of art, with intricate esthetically pleasing designs, exquisite turnings and damascened patterns including ivy (a symbol of life) and birds. Some were gilded with gold or silver. Bliquez suggests that these tools were valuable and treasured by the practitioners who wielded them, and that the elaborate designs might have helped to convey a sense of mystique or impressiveness to the patients and families [who undoubtedly needed to be reassured that the surgeon had the necessary tools for the job]. Many of the tools had usable opposite ends. Bliquez referred this end as the “diagnostic” end—this versatility in one tool provided a kind of efficiency for rapid use. For example, the sharp-bladed scalpels had

flattened opposing ends shaped like a bay leaf which were used for blunt dissection. [Perhaps in the sense that these were used for probing, exploring, and developing a plane of dissection, these might therefore be termed “diagnostic”, as opposed to the more overtly “therapeutic” end used for sharp dissection].

The scalpel (diminutive of Latin “scalpo”, “to scratch or cut”) came in various shapes: a belly-or breast-shape for superficially incising the skin, and a triangular-shape for puncturing or cutting deeper. An Attic red-figure vase depicts the use of one of these scalpels for bloodletting on a rather apprehensive-appearing subject. Bleeding cups were used to catch the blood. Also, after heating and applying to the smooth skin surface, they were used to generate a vacuum to enhance the rate of flow of blood from the incised vein. Such cups and scalpels were depicted on a doctor’s grave marker in Bingen. Bleeding was done in adherence to the theories regarding bad humors and was sometimes actually efficacious. [In fact it is still done today for conditions such as polycythemia vera, an excess of red blood cells, and until recently for congestive heart failure. Cupping is also still practiced by healers from other traditions].

A hooked instrument (lithotomon, ?spelling) was shown in which the inner curve of the hook was serrated. It was used to pull out objects such as bladder stones, or a deceased fetus (hooked by the cranium, orbit, clavicle, etc.). Bliquez stated that bladder or urethral stones were especially common in young males, perhaps related to a particular diet of gruel. He described the procedure of lithotomy whereby the surgeon extracts a stone in the urethra [or bladder]. The surgeon feels and isolates the stone by palpating through the rectum, then makes an incision in the perineum (the space between the scrotum and the anus), and uses the hook device to remove it. The wound was left open without suturing. The Hippocratic oath states “I will not cut persons laboring under the stone, but will leave this to be done by men who are practitioners of this work.”⁴ Bliquez states that lithotomy, like several other complex procedures of the time, was performed only by skilled specialists and not by generalists.

Retractors were used for various purposes, including to retract and withdraw the tonsil during tonsillectomy. Needles on the ends of handles were used for couching cataracts (“coucher” = French for “to put to bed”) during the Hellenistic era and were described by Celsus. The eyeball was impaled and the opaque lens (cataract) was pushed into the vitreous humor hopefully out of the way of the axis of central vision. Some needles were hollow and may have been used to suck out the lens. [Contemplating this procedure on an awake patient, we can only be thankful for modern anesthesia and improved techniques for cataract extraction!]

Cautery (from Greek “kauterion” = “branding iron”) was performed to stop bleeding or for bloodless surgery, and was described by Orabasius. Most cautery tips were made of iron or steel, which best tolerated the red-heat utilized. Cautery tools often had a characteristic kink. One device had a working end shaped like a half moon, which Bliquez matched with the textual description for a device described for stopping bleeding after circumcision. A colleague has kidded him that he would be known for this discovery the rest of his professional life.

Forceps (Latin “to grab, pincers”) were used for hemorrhoidectomy and uvulectomy [I’m not sure why they wanted to remove this structure, which is located hanging down at the back of the mouth]. The ostraga (?spelling) was used to remove bone fragments in comminuted fractures and foreign bodies. Bliquez illustrated the use of this tool in a painting from one of the Vesuvian cities, depicting a stoic-appearing and standing Aeneas having an arrowhead removed from his thigh.

He also showed chisels and saws for bone surgery and amputations. The trephine (trepan) drilling tool was shown—these circular saws were used in conjunction with a bow-like crown drill to drill a circular hole in the skull (trephining or trepanning) in order to release ill humors or traumatic accumulations of blood. [Currently this procedure is still done for drainage of blood collections, epidural and subdural hematomas, resulting from trauma]. Bliquez stressed that many of the ancient medical instruments, such as the crown bow drill, had equivalents in the world of carpentry and that they may have evolved from that body of instruments.

Dental bridges were made by the Etruscans. One sample Bliquez showed depicted a band spanning the canine teeth which could hold prosthetic incisors (front teeth). There was some question whether

these were used to replace damaged teeth or purely for cosmetic enhancement in women. Iron forceps were used to extract teeth, though the ancients were reluctant to do this because of fear of breaking off the tooth root or causing infection. A bronze leg prosthesis sheath was also shown in slides—the sheath had covered the inner wooden part, which had long previously rotted away.

He also showed a variety of speculums [Latin “mirror”, also perhaps “speculator” = “to look around, explore”]. These were used for spreading apart the orifice in order to permit visualization and surgical access to the interior of the rectum or vagina. Some of these from Pompeii were ornately decorated with snake heads, representing Asclepius.

Childbirth was a dangerous business in ancient times, and many women died giving birth. Forceps for live extraction of the fetus were not been invented until later times (the Doctors Chamberlen in the 16C - 17C) and were not used in antiquity. There was no such thing as Caesarian section, other than to deliver the fetus from a deceased mother. As mentioned above, various tools were used to extract a deceased fetus or to perform abortion. Birthing chairs were used to facilitate access during seated childbirth.

Bliquez also showed slides of several different types of cannulas (Latin “little reed”) used to tap and drain fluid collections in the pleural space of the chest—these included empyemas (pus) and effusions related to heart failure (dropsy or hydrothorax). Catheters (Greek “katheter” “to let down into”) in sizes and shapes appropriate to gender were used to drain urine from an obstructed bladder. Finally, he showed several clysters (Greek “klyster” = “enema”), used for administering douche and enema treatments.

There has been a problem of forgery in ancient medical instruments, perhaps because wealthy doctors and medical institutions like to buy these rare devices. For instance, the “Scoop of Diocles”, ostensibly for removing imbedded arrowheads, has been fraudulently recreated in multiple copies.

¹ See <http://ea1785.org/medant/>

² See <http://ccat.sas.upenn.edu/bmcr/1998/98.6.22.html>

³ A sample: “If a physician make a large incision with the operating knife, and kill him, or open a tumor with the operating knife, and cut out the eye, his hands shall be cut off.” c. 1750 BCE, transl. by L. W. King

⁴ Translated by Francis Adams, <http://classics.mit.edu/Hippocrates/hippooath.html>.