

Cockatrice



**Bone carved Cockatrice made by the late THL
Lughaid Cnuachd Dharaich mac Aonghuis
Dhuibh of Southron Gaard**

August A.S. 52

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From the Editor

Greetings!

Welcome to a very diverse August 52 edition of Cockatrice!

I recently had the privilege of attending Midwinter Coronation in the beautiful Hamilton gardens. It was wonderful to see the good gentles of Lochac looking their finest in such an appropriate setting of Tudor and Italian Renaissance gardens.

We are advertising for a new editor for Cockatrice and I do encourage you to consider taking on this role. I have been Editor for the past 5 years and have

loved every minute of it. It is so much fun to see the contributions appearing in in inbox and reading about such a variety of Arts and Science activities from all over Lochac.

While I have enjoyed my time as editor I think 5 years is long enough to hold this position and it is time for Cockatrice to be refreshed with new energy and new ideas. If you think this is you then please contact the Kingdom Arts and Science officer at artsandsciences@lochac.sca.org to express your interest.

En servicio

Elisabetta Foscari

Cockatrice Calendar AS 52 (2017/18)

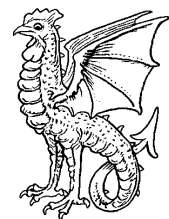
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From East to West

Ælfred se leof

Whilst researching Southeast Asia in the SCA period for a previous *Cockatrice* article (see leof, 2016), I read numerous accounts of European travellers, colonists and missionaries who travelled into the east. But what about people moving in the opposite direction? Did anyone from Asia come to Europe during the SCA period and, if they did, what did they think of what they saw?

Of course Europe is attached to the western part of Asia, and there has been traffic between the two for all of recorded history. People familiar with European history would know that Alexander the Great conquered lands from Greece to India, and both the Roman Empire and the Crusaders occupied territory in what we now call the Middle East. From the other direction, the Mongol and Ottoman Empires occupied parts of Eastern Europe over the thirteenth to fifteen centuries. But in keeping with my previous article, I'd like to focus on travellers from the east of India.

China and Rome

Europe and Asia have been connected economically since ancient times through the series of trade routes now known as the Silk Road. Goods could travel from East Asia through Central Asia to Europe, and vice versa, through a series of exchanges between merchants, but very few people made the entire journey themselves. There were certainly no Greek or Roman colonies in China, or Chinese colonies in Europe, of the sort I wrote about in my previous article.

Roman geographers were aware that there was some land in the east – inhabited by people known as the “Seres” – from which silk and other goods originated, but they had only the vaguest idea of where it was or what it might be like. Strabo, writing in the first century BC, records doubtful tales of the Seres living for up to two hundred years. Pliny, writing in first century AD, reports them to have yellow hair and blue eyes, and that silk is obtained by soaking the leaves of certain trees in water.

The situation appears to have been much the same at the Chinese end. The Han Dynasty (202 BC – 220 AD) had relations with Parthia, in what is now Iran, and was aware that that there was another empire further to west, called *Lijian* or *Da Qin* (“Great China”).

What they knew of it is recorded in a chapter known as *The Peoples of the West*, written by Yu Huan in the third century AD, and a history known as the *The History [or Book] of the Later Han*, compiled by Fan Ye in the fifth century.

Yu Huan's information seems to be correct when it states that *Da Qin* extended for thousands of kilometres and contained hundreds of towns, but more questionable when it reports that its rulers were replaced whenever disastrous "unusual phenomena" occurred, and downright baffling when the inhabitants of *Da Qin* are said to make cloth from "the down of water-sheep".

The History of the Later Han records that Ban Chao, governor of the western regions of the Han empire in the first century AD, sent an assistant by the name of Gan Ying on a mission to contact *Da Qin* in 97 AD. Gan Ying eventually arrived in a place called *Tiaozhi*, on the edge of a sea that Parthian sailors told him would take three months to cross with favourable winds, or two years otherwise. This information prompted Gan Ying to turn back.

Most historians, including McLaughlin (2016) and Liu & Shaffer (2007), think that *Tiaozhi* lay on the Persian Gulf, and that the three-month-or-longer journey was a garbled and/or exaggerated account of how to reach Rome itself by sailing from the Gulf. McLaughlin observes that Gan Ying could in fact have reached the eastern border of the Roman Empire in about forty days by travelling overland to Syria, had he known to do so. A few others, such as Zhang (2005), speculate that the sea involved might have been the Mediterranean, which might make Gan Ying's sailor's estimate more reasonable. But Liu & Shaffer argue that this cannot be, since Gan Ying's *Tiaozhi* was controlled by Parthians, while the Mediterranean was controlled by Romans at this time.

The subsequent Wu Dynasty (220 – 280 AD) had another opportunity to reach Rome in the third century AD, when a document known as the *Liang-shu* tells us that a Roman merchant called Lun arrived in southern China. The Wu emperor sent one Liu Xian on a return journey with Lun, along with twenty "blackish coloured dwarfs" who had been captured by some Chinese and who Lun thought would make a novelty in Rome. No record exists of Lun, Liu Xian or any dwarfs having reached the Roman Empire, however, and the *Liang-shu* supposes that Liu Xian must have died on the journey.

This seems to have been the end of Chinese adventures into the far west, until the voyages of Zheng He in the fifteen century. Zheng He visited Arabia and East Africa in several voyages over 1405-1431, before dying in India in 1433. But the Ming Dynasty

turned against international exploration in 1430, withdrawing from Southeast Asia, and (we now know) leaving the seas to be dominated by European powers over the following centuries.

The Mongol Empire

In between the times of the Han and Wu Dynasties and those of the Ming Dynasty, came the Mongol Empire. Genghis Khan famously conquered territory all the way from Korea to the Ukraine in the early thirteenth century. After his death in 1227 AD, the empire was divided into four khanates, of which the Golden Horde is of most interest to this article.

The Golden Horde occupied the north-western part of the Mongol Empire, covering the Caucasus, the Ukraine, and parts of Russia. Over 1237-1242, armies led by Genghis Khan's grandson, Batu, and one of Genghis Khan's generals, Subedei, ventured deeper into eastern Europe, sacking cities in what is now Hungary and Poland; a recent book by Frank McLynn (2015) gives a detailed account. The campaign reached as far west as Vienna, but here the Mongols turned back. It is often supposed that this was due to the death of the Great Khan, Ogedei, in 1241, but no one is really sure and historians have suggested a number of other explanations that you can find in McLynn's book.

A few decades later, Marco Polo and his brother arrived at the court of Kublai Khan in Mongolia itself. According to Chapter 7 of Marco's *Travels*, the Khan asked the brothers to bring a letter to the Pope, accompanied by a Mongol baron known as Cogatal. What happened to Cogatal, however, is unknown.

The Golden Horde continued to exist in various forms for the next few centuries, but never again came so far into Europe. The Horde itself was eventually absorbed by the Ottoman Empire in the late fifteenth century.

Southeast Asia

Arabs seem to have been travelling to south-east Asia within the first few centuries after the Prophet Mohammed (Lockard 2009). After much of the Malay Peninsula, Sumatra and Java converted to Islam over the course of the fourteenth and fifteen centuries, at least a few south-east Asians travelled back to Islamic centres in the Middle East. The most famous of these is Hamzah Fansuri, a Sumatran poet who lived in Baghdad in the late sixteenth century or early seventeenth century, but I couldn't find any stories of anyone making the extra step to Europe.

Evidently at least one south-east Asian was brought back to Europe, however, because contemporary accounts of Ferdinand Magellan's circumnavigation of the Earth refer to Magellan bringing with him a slave that he had earlier acquired in Melaka. Maximilianus Transylvanus says that the slave was originally from Maluku, and both Transylvanus and Antonio Pigafetta have him acting as an interpreter once the voyage reached the Philippines. In later writing, the slave came to be known as "Enrique", the Spanish version of the name given to him by Pigafetta. What Enrique did whilst in Europe awaiting Magellan's famous voyage, or thought about being there, is not recorded.

Some speculate that Enrique might have been the first person to travel all the way around the globe, albeit without having had much say in the matter. Magellan himself was killed in the Philippines, and Enrique would have completed the circuit upon arriving in Melaka (or Maluku, if Transylvanus is correct) while the rest of Magellan's crew had to return to Europe to complete the journey. While Pigafetta says the Enrique survived the massacre that did for many Magellan's crew in the Philippines, no more is said of him and so we do not know if or when he ever made it back to his point of origin.

Conclusion

Stories of Asians travelling to Europe during the SCA period seem to be somewhat rarer than those of Europeans travelling to Asia, and several of the Asians who tried are reported to have met bad (or at least mysterious) ends. None of them seem to have left us with details comparable to those that survive from Marco Polo, or Ibn Battuta, or Tomé Pires. It's possible that this is a bias introduced by my perspective as a Westerner looking eastwards, and by reading mostly histories written by other Westerners (though I also searched several modern histories translated from Chinese, such as Zhang's and Li's). But I hope this little history gives some idea of what the SCA's world might have looked like from the Far East nonetheless.



Marco Polo at the Court of Kublai Khan from a contemporary manuscript of *The Travels of Marco Polo*. Image from

https://commons.wikimedia.org/wiki/File:Marco_Polo_at_the_Kublai_Khan.JPG

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Translations of relevant sections of *The History of the Later Han* can be found in the modern histories cited above.

Hemlock - *conium maculatum*

Adelindis filia Gotefridi

This paper was written as an entry in the Ynys Fawr A&S competition, "Make or Document an Instrument of Assassination", held at the Assassin's Ball, September 9th 2016.

Introduction

Hemlock as a poison has an ancient history. It was known to the Ancient Egyptians, being mentioned in the Ebers papyrus, a compilation of medical and toxicological lore dated to 1500 BCE. As well as being the poison of choice for state executions in Ancient Greece (it is generally considered to have been the poison used to kill the philosopher Socrates in 399 BCE), hemlock was referenced by a number of Ancient authors as used in suicide or euthanasia, particularly in the elderly¹, and is considered to be one of the more common poisons used in the Ancient world. William Hayes writes of the Romans: 'Poisoners preferred plant poisons rather than animal or mineral poisons. Favourites included belladonna, aconite (Wolfbane, monkshood), hemlock, hellebore, colchicum, yew extract, and opium.'²

Unlike more violent means, poisoning is a difficult method of assassination to substantiate, due to the absence of forensic science in period and a medical model of knowledge which was based on very different principles to ours. Deaths were often attributed to poison which may have been from other causes, particularly in periods when the danger of poisoning was considered to be rife, such as Rome in the first two centuries CE. Outside of legally sanctioned or semi-voluntary Greek examples such as Socrates, Theramenes and Seneca, which have come down to us in the works of classical historians, there are no historical deaths I can reliably identify as being directly caused by the ingestion of hemlock. Therefore the evidence I have collected relies on contemporary descriptions of the use of hemlock, both in medicine and in toxicology. There are also literary references which, while they cannot be reliably substantiated as referring to historical poisonings or poisoners, still help paint a picture of how hemlock was seen in period.

Description of *Conium Maculatum* and its Effects

Description: *Conium maculatum* is a member of the carrot family and closely resembles other species of *Apiaceae* such as wild carrot, parsley and Queen Anne's Lace. It is usually a biannual, growing to about 45cms tall in the first year, and up to 1.8m in its second season, when it flowers. The root is long, white to pale yellow, and resembles wild carrot or parsley root. The

1 Some examples are collated here: <http://laudatortemporisacti.blogspot.com.au/2012/07/senicide-part-iv.html>

2 Hayes, A. Wallace, *Principles and Methods of Toxicology*, Fifth Edition, New York, 2008, p. 14

stem is hollow, bright green mottled with purple splotches, and slightly ridged. The leaves are dark green, lacy and fernlike. Both leaves and stem have a strong, unpleasant smell when crushed, often described as being mouse-like or resembling cat urine. The flowers are small, white and umbelliferous, and are highly attractive to bees. The seeds are small and slightly ovoid (2-3mm).

Toxicity: All parts of the plant are highly toxic, although the effects are most concentrated in the seeds and root. There have been eight alkaloids identified in poison hemlock, of which two - coniine and gamma-coniceine (the precursor to the other alkaloids) - are most prevalent. Coniine is reportedly up to eight times more potent than gamma-coniceine. The levels of the alkaloids in the plant can fluctuate considerably due to weather conditions, fertility of the soil, soil moisture, and ripeness, and even what time of day the plant is collected. Young green fruits contain more alkaloids than mature fruits, so the toxicity reaches its height as the fruit ripens, then reduces as it dries³. The harmful dosage appears to be variable, but shows that a lethal dose of juices containing coniine is probably not very large:

In man [sic], 3 mg of coniine is said to have produced symptoms, but 150 mg have been tolerated without discomfort. Perhaps 30-60 mg is dangerous and death may occur with doses greater than 100 mg. It has been reported that a lethal dose may be 6 to 8 fresh leaves.⁴

Effects and Treatment: The International Program on Chemical Safety's Poisons Information Monograph (PIM) on *c. maculatum* describes the primary effects as follows:

The clinical effects are mainly neurological and when death occurs it is probably secondary to respiratory paralysis with hypoxia. The most prominent signs are due to peripheral paralysis and loss of sensation... Seizures may occur terminally. (Lampe, 1985; Geehr, 1984; Gosselin, 1976; Dreisbach, 1987).⁵

There is still no known antidote to hemlock poisoning, and - then as now - treatment involves inducing vomiting to prevent further absorption in the stomach, and supporting the patient while the toxins already absorbed pass through the body. Modern treatment could also include sedation and artificial respiration, with other treatments administered as needed⁶.

What Killed Socrates? Historical confusion between *Conium maculatum* and *Cicuta virosa*

3 *ibid.*, 6.2 and 7.3

4 International Program on Chemical Safety, Poisons Information Monograph "Conium maculatum L.", found at <http://www.inchem.org/documents/pims/plant//conium.htm>, accessed 24 June 2016

5 *ibid.*

6 Larsson, *op. cit.* 7.6

The first difficulty in any investigation into the herb known as *cicuta* in sources from Rome through to modern times is ascertaining which plant is being talked about. There has been a considerable degree of confusion for many years as to the nature of the poison which Socrates was given - Plato himself did not name it, referring only to "the poison", although Pliny refers to hemlock (disapprovingly) as the judicial poison of the Greeks⁷ - which illustrates the difficulty of tracing references to *c. maculatum* in the sources.

This confusion is largely linguistic in origin. The Greek name *koneion* and Latin name *cicuta* were used by classical authors to refer a highly toxic plant, translated as "hemlock", and most likely what is now known as *c. maculatum*. The name *cicuta* continued in that usage in later Islamic and European works drawing on the classical texts, but was increasingly broadly applied. The word "hemlock" itself is from the Old English *hemlic* or *hymlice*, and the modern spelling first came into usage with Shakespeare⁸. The usage of "hemlock" and "*cicuta*" became increasingly confused after the Romans, and eventually broadened to cover all known members of the hemlock family more or less interchangeably. The authoritative botanical name *Cicuta virosa* was given (by Gesner) to water hemlock in the 16th century, while poison hemlock was given its current name *Conium maculatum* (by Linnaeus) in reference to the Greek *koneion* - doing nothing to decrease the confusion⁹.

Pliny's description of *cicuta* from the first century CE is worth quoting in full, as the most complete classical reference I have found:

This stem is smooth, jointed like a reed, of a swarthy hue, often as much as two cubits in height, and branchy at the top. The leaves are like those of coriander, only softer, and possessed of a powerful odour. The seed is more substantial than that of anise, and the root is hollow and never used. The seed and leaves are possessed of refrigerating properties; indeed, it is owing to these properties that it is so fatal, the cold chills with which it is attended commencing at the extremities.¹⁰

Of this, only the description of the root as hollow recalls water hemlock more than poison hemlock. As Bloch argues, the description of the effects as "cold chills...commencing at the extremities" is far more reminiscent of slow peripheral paralysis than the violent "hot" convulsions of water hemlock toxicity. Indeed, the marked differences between the effects of the two plants has been the biggest reason for the confusion as to identification persisting into the 20th century.

7 Pliny the Elder, *Naturalis Historia*, 25:95, translation found at <http://www.perseus.tufts.edu/hopper/text?doc=Plin.+Nat.+25.95>, accessed 24 June 2016

8 Larsson, *op. cit.*, 10.2

9 Bloch, Enid, "Hemlock Poisoning and the Death of Socrates: Did Plato tell the truth?", *Plato 1* (2001), online: posted January 2008, <https://gramata.univ-paris1.fr/Plato/article9.html>, accessed 23 June 2016

10 Pliny, *op. cit.*

Bloch summarises the modern debate, in which authors such as classicist Christopher Gill and pathologist William Ober, writing in the 1970s, and Bonita Graves et. al. in 1991, argued that the description given by Plato was distorted for political and philosophical reasons, in order to provide a picture of a dignified, peaceful death¹¹. However, she argues that this rests on the longstanding linguistic confusion between the various hemlock species contributing to a misunderstanding of the clinical effects of *conium maculatum* as being similar to that of *cicuta virosa* and other members of the hemlock family. Of all the hemlock species, *c. maculatum* is unique in possessing toxic alkaloids. She goes on to argue convincingly that linguistic and cultural evidence from the Greek and Roman sources combined with detailed nineteenth century scientific examination of the effects of *c. maculatum* paints a remarkably faithful picture of poison hemlock as the poison given to Socrates, and thus as the plant referenced as *keoneion* or *cicuta* by most Greek and Roman authors¹². Because of this confusion, I will confine my discussion to the Greek and Roman sources.

Which Part of the Plant was Used?

As all parts of *c. maculatum* are toxic, the entire plant could have been utilised by poisoners. However, there are certain drawbacks which mean that some methods of preparation and administration seem more plausible than others. The distinctive acrid smell and bitter, burning taste of the fresh herb must limit its effectiveness as a surreptitious poison in food, since it could be easily detected by a trained taster or a sufficiently paranoid diner. I address the fresh leaves and root in the second section, on methods of ingestion.

The characteristic odour is at least in part attributable to coniine, which is a volatile a colourless [sic] liquid with a bitter taste (Schvarstman, 1979; Gosselin, 1976; Keelers, 1978).¹³

Since the source of the distinctive smell is partly also the source of the toxicity, it must be assumed that most methods of preparation would have to disguise the taste and smell. If not used fresh, there must have been some method used to concentrate and preserve the active compounds for storage and transport. The parts of the plant which will be discussed in this section on preparation are the seeds, juices, leaves and flowers. The primary sources I have found do not always specify what part of the plants were used in poisons (reasonably enough,

11 Bloch, *op. cit.*

12 I also find her argument against the reliability of Nicander's description of *cicuta*, which conflicts with Plato's description and with modern understanding of the effects of *c. maculatum*, to be convincing, but for reasons of space will not cover it here. She argues that he has most likely become confused with his sources and is attributing the effects of aconite to hemlock.

13 International Program on Chemical Safety, *op. cit.*

since, particularly for the Romans, they would be wary of the potential for their work to be misused), so some of my argument will necessarily be conjectural.

Preparing the Poison

Seeds

There are a number of references to hemlock seeds in Celsus' works, but all refer to its medicinal properties rather than as a poison, and do not discuss methods of preparation¹⁴. Pliny describes the use of the plant thus: "It is the seed that is noxious, the stalk being eaten by many people, either green, or cooked in the saucepan."¹⁵ He goes on to write,

The seed is crushed, and the juice extracted from it is left to thicken in the sun, and then divided into lozenges. This preparation proves fatal by coagulating the blood—another deadly property which belongs to it; and hence it is that the bodies of those who have been poisoned by it are covered with spots.¹⁶

From this, it appears that the ancients understood very well that the seeds contained the highest concentrations of coniine, and that the concentration was highest in the ripe fruits.

Juices

From the linguistic evidence, the poison given to Socrates may have been prepared from fresh hemlock immediately before administration. When Socrates asked if he could offer some of the dose to the Gods, the jailor replied, "we prepare only as much as we think is enough."¹⁷ Bloch, examining the original Greek with more facility than I can do, writes,

It is evident that [Socrates' jailor] crushed the hemlock, for when Socrates asked him to 'prepare' the poison, he used a form of the verb *tribô*, which means to crush, as in a mortar.¹⁸

Not knowing Greek, I cannot judge whether the same word would have been used for crushing a fresh herb and crushing a lozenge into powder to add to a liquid, but it appears that both the juices from the fresh herb and the concentrated and dried juices formed into a lozenge for storage were both used for their lethal properties.

14 Celsus, *De Medicina*, Book 5, translation found at http://penelope.uchicago.edu/Thayer/E/Roman/Texts/Celsus/5*.html, accessed 5 July 2016

15 Pliny, *Nat. Hist.*, 25:95, He is correct in identifying the seed as the most poisonous part of the plant, but the stem is certainly not safe to eat!

16 *ibid.* I have found no reference to spots or anything similar in the clinical descriptions of symptoms of either *conium maculata* or *cicuta virosa* poisonings; it could possibly be a reference to the discolouration of hypoxia?

17 Plato, *The Phaedo*, pp. 117-8

18 Bloch, *op. cit.*

Descriptions of a compound poison containing the juices of hemlock, which may be similar to that given to Socrates (both Bloch and Larsson argue for the likelihood that the hemlock was combined with opium), are given by Theophrastus in his *Enquiry into Plants*, written some time in the century after Socrates' death:

Thrasyas of Mantinea had discovered, as he said, a poison which produces an easy and painless end; he used the juices of hemlock, poppy and other such herbs, so compounded as to make a dose of conveniently small size, weighing only somewhat less than a quarter of an ounce. For the effects of this compound there is absolutely no cure, and it will keep any length of time without losing its virtue at all...

Now these things seem to have been ascertained far better in recent than in former times. And many things go to shew that the method of using the various drugs makes a difference; thus the people of Ceos formerly did not use hemlock in the way described, but just shredded it up for use, as did other people; but now not one of them would think of shredding it, but they first strip off the outside and take off the husk, since this is what causes the difficulty, as it is not easily assimilated; then they bruise it in the mortar, and, after putting it through a fine sieve, sprinkle it on water and so drink it; and then death is made swift and easy.¹⁹

This would appear to indicate that the plant was crushed and the juices were sieved to remove the plant matter and added directly to liquid. The description does not indicate the exact part of the plant from which "they first strip off the outside and take off the husk", but it is possible this refers to the fruit. I'm not entirely certain how you would do this, given how tiny the seeds are, but taken with the reference to "bruising" (rather than grinding to a powder, as with the dried seeds), one interpretation could be removing the green fruits from the flower umbels before crushing.

However, Pliny refers to juices being extracted from the leaves and flowers as well as the seeds:

A juice is extracted from the leaves and flowers; for it is at the time of its blossoming that it is in its full vigour. The seed is crushed, and the juice extracted from it is left to thicken in the sun, and then divided into lozenges.²⁰

This could be read as two separate preparations, or as including the immature fruits as part of the flowers. Dioscorides supports that interpretation in his discussion of hemlock in the *Materia Medica*. While he notes that hemlock is "one of the venomous herbs", he does not mention lethal

19 Theophrastus, *Historia Plantarum*, found at https://www.loebclassics.com/view/theophrastus-enquiry_plants/1916/pb_LCL079.305.xml, accessed 17 May 2016, pp. 303-5

20 Pliny, *op. cit.*

uses as an agent for suicide or euthanasia, and like Celsus, speaks only of the use of the juices in various medicinal preparations:

The tops (or the filaments) are juiced before the seed is dry, pounded, pressed out, and thickened by stirring in the sun. Dried, this is very useful in cures ... The herb and the filaments (pounded into small pieces and smeared on about the testicles) help lustful dreamers and nocturnal emission of sperm; and smeared on, they weaken the genitals.²¹

The use of "filaments" is somewhat ambiguous here. The reference to using "the tops (or the filaments)...before the seed is dry" suggests it may refer to the umbelliferous flower clusters and unripe fruits, as suggested by Pliny. "The herb and the filaments" might also refer to the leaves. Without a knowledge of Greek I am unable to judge. However, it does look as though the method of crushing the herb - in whatever combination of leaves, flowers or green fruit - and thickening the resulting juices by evaporation was a common one. The drying of the juices may serve to reduce the acrid smell of the fresh plant, making the powder less noticeable in food or drink, although it might also effect its level of toxicity through evaporation of some of the volatile alkaloids. Larsson writes, "If fresh hemlock was to dry under the sun during seven days an important loss of biological activity occurred."²² It is not clear if the same would apply to the juices, but seems plausible.

In both the cases of Socrates and the citizens of Ceos referred to by Thrasyas, the enforced or voluntary consumption of the extract means that disguising the distinctive taste and smell of hemlock is not an issue. However, an ancient poisoner must have had to find a method of ingestion which is undetectable to the intended victim.

Some Proposed Methods for Use by an Ancient Poisoner

We have very few references to the way in which hemlock could have been administered by a poisoner. The most direct reference to hemlock poisoning I was able to find in the early literature was the hemlock in honey of Horace's *Satires*.

Hemlock In Honey

The Roman poisoner Canidia, while possibly apocryphal²³, is commonly referenced as one of an infamous trio of female poisoners in the first century AD. The others are Locusta and Martina, both better attested as historical figures. A later commentator, Pomponius Porphyrius, writing in the third century CE) identifies a real life model for Canidia as Gratidia, a perfume woman

21 Dioscorides, *De Materia Medica*, found at <http://panaceavera.com/BOOKFOURROOTS.PDF>, accessed 17 May 2016

22 Larsson, 7.5

23 In *Latin Verse Satire: An Anthology and Reader*, p. 178, Paul Allen Miller writes, "Canidia is portrayed as poisoner and witch in Horace (*Satires* 1.8, 2.8 and *Epodes* 5 and 7). She corresponds to no known historical personage."

(*unguentaria*) from Naples, but this is disputed by modern historians²⁴. Canidia is usually given as one of the few examples we have of specific Roman poisons being referenced in the literature, and is associated with honey poisoned with hemlock. In his *Satires*, Horace writes,

That implacable witch Canidia menaces [her enemies]
with the poison Albucius used on his wife; Turius
imposes a heavy fine if you go to court
while he's on the bench. So everyone would terrify
The ones he most fears by whatever natural means
he can wield. Come now, infer the way of the world
with me, from the following facts: wolves use their teeth,
bulls their horns, to attack. Are they not so instructed
by instinct? Suppose you entrust to the spendthrift Scaeva
An aged mother who keeps living on and on:
his filial hands commit no capital crime-
But what's so amazing? The wolf won't fight with his hoof,
Nor an ox with his teeth. A honey-flavoured cup
of the very best hemlock will fix the old woman up.²⁵

Neither Albucius and Scaeva are known to correspond to historical figures (although Porphyrius also mentions Albucius as a wife-murderer²⁶) and the character of "Scaeva" (presumably from the cognomen *scaevola*, meaning left-handed, and therefore a play on *sinister* as evil or unlucky) may be solely a rhetorical device²⁷.

There are certainly problems in taking the *Satires* as direct historical evidence of contemporary practices, as is often done, given the likely apocryphal nature of the figures being referenced, and the apparently circumstantial nature of the connection between Canidia's "poison of Albucius" and the hemlock and honey administered to his mother by Scaeva. However, given the pervasiveness of fears of poison in the era in which the *Satires* were written, the existence of other professional female poisoners such as Locusta and Martina, the discussion in contemporary and earlier sources of hemlock as a method of euthanasia for the elderly, and the toxicological plausibility of the method described by Horace²⁸, it is certainly suggestive of a method that may have been widely known, enough to make the reference obvious to Horace's readers. The combination of bitter but colourless hemlock juices with honey would certainly

24 Raia, Ann A., "Quintus Horatius Flaccus, Sermo I. 8: Canidia", found at http://www2.cnr.edu/Home/araia/Horace_canidia.html, accessed 21 May 2016

25 Horace, *Satires* 2:1, Bovie, Smith Palmer (trans), *Horace: Satires and Epistles*, Chicago, 2002, p. 101

26 Miller, *ibid.*

27 Miller, *ibid.*

28 Robert Bevan-Jones writes, "The use of it in honey indicates they were aware that hemlock weakens in toxicity and power on drying, honey being an excellent preservative." Bevan-Jones, Robert, *Poisonous Plants: A Cultural and Social History*, Oxford, 2009, page numbers not given.

disguise the taste. There was certainly no shortage of Roman recipes which incorporate honey. Fear of poisoning, primarily through food and drink, was also widespread in the Classical world.

The history of poisons and poisonings in Ancient Rome is vividly recorded over some five centuries, from the first allegation of mass poisoning in 331BCE to the heyday of dynastical poisonings in the first and second centuries CE (after which point there are fewer accounts of poisonings, which may or may not equate to a lessening in the frequency with which poisons were employed). "Poisons were usually administered with food or drink – and for this reason official tasters, *praegustatores* (slaves or freedmen), were employed by the nobility and wealthy. They became so common that they formed a collegium with a *procurator praegustatorum*."²⁹ Employing a praegustator was no guarantee of safety, however, as this office-holder was in the perfect position to be bribed to poison their employer's food, as may famously have happened in the death of Claudius in 54 CE. His taster, Halotus, was considered to have been at least partly responsible for the Emperor's death, in conspiracy with the Emperor's wife Agrippina and physician Xenophon³⁰.

In Wine

Honey appears prominently in the first two recipes in the collection by Apicius: Fine Spiced Wine and Honey Refresher for Travelers. The translator remarks in a footnote, "Apicius is correct in starting his book with this formula, as all meals were started with this sort of mixed drink."³¹ Both recipes are highly spiced, and the combination of wine, honey and spices would presumably hide the bitterness of the hemlock extract successfully. The recipe for Fine Spiced Wine is as follows:

Into a copper bowl put 6 sextarii¹ of honey and 2 sextarii of wine; heat on a slow fire, constantly stirring the mixture with a whip. At the boiling point add a dash of cold wine, retire from stove and skim. Repeat this twice or three times, let it rest till the next day, and skim again. Then add 4 ounces of crushed pepper, 3 scruples of mastich, a drachm each of nard or laurel leaves and saffron, 5 drachms of roasted date stones crushed and previously soaked in wine to soften them. When this is properly done add 18 sextarii of light wine³².

The major drawback to this recipe for a poisoner is that it could not be targeted precisely. Presumably in order not to wipe out the entire household, the poisoner would still have to slip

29 Cilliers, L and F. P. Retieff, "Poisons, Poisoning and the Drug Trade in Ancient Rome", *Akroterion* 45 (2000), pp. 88-100, p. 98

30 see, for example, Suetonius in *The Lives of the Twelve Caesars: Life of Claudius*, 5:44, found at http://penelope.uchicago.edu/Thayer/E/Roman/Texts/Suetonius/12Caesars/Claudius*.html, accessed 2 July 2016

31 Apicius, *De Re Coquinaria*, Vol 1, translation found at <http://penelope.uchicago.edu/Thayer/E/Roman/Texts/Apicius/home.html>, accessed 2 July 2016

32 *ibid.*

drugged honey or extract into the individual cup, rather than poisoning the entire batch. However the next recipe Apicius provides is made up in convenient single serve portions.

The wayfarer's honey refresher (so called because it gives endurance and strength to pedestrians) with which travelers are refreshed by the wayside is made in this manner: flavor honey with ground pepper and skim. In the moment of serving put honey in a cup, as much as is desired to obtain the right degree of sweetness, and mix with spiced wine not more than a needed quantity; also add some wine to the spiced honey to facilitate its flow and the mixing³³.

Honey is also mentioned as sweetening or tempering several other recipes for wine in the chapter. That the Romans indeed feared poisoning with hemlock added to wine is seen in Pliny's discussion of the herb:

The great remedy for it [hemlock], provided it has not reached the vitals, is wine, which is naturally of a warming tendency; but if it is taken in wine, it is irremediably fatal.³⁴

It is also possible that the hemlock extract was added to wine directly. The mention of Thrasyas' potion as one that "will keep any length of time without losing its virtue at all" suggests that the problem of preserving the alkaloids for long storage had been addressed somehow, and, like honey, wine is a chemically plausible method³⁵. The delicate alkaloid coniine is soluble in alcohol, so the juice, when extracted, could have been compounded in alcohol to preserve it for storage, and the mixture later added directly to the wine of the victim.

In Food

Honey is mentioned often in the recipes of Apicius, both sweet and savoury, so it would appear that opportunities to use the adulterated honey would have been easy to come by. Any lingering bitterness from the hemlock could have been disguised by other common strong-tasting ingredients. It seems unlikely that fresh parts of the plant could have been directly substituted for similar ingredients. Pliny states that the root of hemlock "is hollow and never used"³⁶, and I have not found Roman or Greek references to the root. It might also be possible to substitute the leaves as part of a salad or other dish. Despite the unpleasant smell and taste, there are many documented modern cases of poisoning from people mistaking it for parsley, which the young leaves closely resemble. A lethal dose, as mentioned above, can be as small as 6-8 leaves. Parsley (*petroselinum*) is also referenced frequently by Apicius, and was popular for cooking and medicinal uses in the Ancient world from the time of Alexander the Great onwards³⁷. However, I have found no references to this being a particular fear of the classical authors, and it seems unlikely

33 *ibid.*

34 Pliny, *op.cit.*

35 Theophrastus, *op. cit.*

36 Pliny, *op. cit.*

37 Anagnostakis, Ilias, "Makedonisi(on): Parsley, the Macedonian Herb", *Flavours and Delights*, 2013, pp. 37-42

given the intense paranoia around poisonings in Rome in particular, the widespread use of tasters who would undoubtedly be able to detect the strong taste and odour immediately, and the common knowledge of hemlock and its effects as reflected in Greek and Roman sources. The effects of *c. maculatum* is no longer as well-known in modern times, resulting in more accidental poisonings. Even so, as Larsson writes, such accidental deaths are still infrequent, due to "the plant's 'mousy' odor, bitter taste and burning sensation of the mouth, throat and abdomen on ingestion" meaning that people who accidentally consume some part of the plant often won't ingest enough for a lethal dose, which supports the idea that the fresh leaves were probably not used by poisoners³⁸. It seems to me that the most likely way to adulterate food or wine would be by using the drugged honey or the extract itself, or a compound poison of some kind containing hemlock, slipped into a dish.

Conclusion

As we have seen, *conium maculatum* was a well-known ingredient in poisons used for execution, suicide or euthanasia in the Greek and Roman world. Its use as a surreptitious poison is also referenced in the literature, often with very little detail. The documented methods I have found of using *c. maculatum* for more nefarious purposes such as assassination by poisoning are an extract of the seeds, leaves and flowers, or some unspecified part of the plant added directly to honey. I have also explored some more commonly feared avenues for administration of poisons, such as adulterating wine or food, or slipping the fresh parts of the plant directly into a dish as a substitute for a similar ingredient. While poisoning is one of the most difficult methods of assassination to substantiate before the advent of modern toxicology, I have attempted to trace some ways in which hemlock may have been used for this purpose.



The Bausor Tree of Noxious Fumes

Image from <http://www.godecookery.com/mythical/mythic02.htm>

38 Larsson, *op. cit.*, 7.6

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Colloquy of the Peerages

A fragment of a Pilgrim's Progress narrative

A fragment in manuscript, translated from Middle English, which is itself very likely a translation from an older source, in an unknown language. The source is a quire of closely written text, found bound into another work. The book, MS Codex A.314159a, is kept in the library of the Invisible College at the University of Erewhon, by whom it was acquired from the Great Library of Borges at an unknown date. The author and translator into Middle English are unknown, as are the dates of composition and translation.

Translated into Modern English by Brian dorcha na Conaill. Recognition and thanks must go to the late Master Ioseph of Locksley, for his great and prior scholarship in this field.¹

...] was led from that happy place full of dance and music.

My guide took me thence to a place which was still and quiet; within there were four figures sitting by a fire. I looked upon them, and they seemed to my eyes as four normal people, boon friends and old companions. Then water rose in my eyes and I blinked, and I saw them flicker in my sight, and when I blinked again they were still but people, although I could not say whether they were men or women, young or old, rich or poor, for it seemed to me that they were all of these things all together.

And these four friends were in an old dispute, each making their case to the others.

The first one among them spoke. I looked, and saw a white belt, and also a white baldrick, and also three rapiers crossed, and I saw a man with a broadsword and shield, and a woman in plate armour, and a fencer with a cloak, and yet also an archer, and one by a trebuchet, and a scout, and a general, and at the heart of all these images was a single person with blistered hands, practicing at striking a pell. This one held up a large horn of beer, and my guide spoke gently into my ear and said: This one is the Peerage Martial, and they are the oldest, for there were Knights before any other, and they are the youngest, for the Masters of Defence are but fresh in recognition. Hearken!

¹ Ioseph of Locksley, *A Dreamer's Travels: Being the Adventures of a Pilgrim In the Current Middle Ages Related as an Allegorical Tale In the Style of the Time*, The Compleat Anachronist #76

The words which the Peerage Martial spoke were these: “My old friends, this is at the heart of the Society: to strive, to fight. Some would say that this is a bad thing, and sooth the concept has been oft sore abused. For these words which have been tainted yet have a noble meaning to them: Kampf, luchar, jihad, whatever it is named, it is the struggle against complacency which is what we do. It is the fight against our own base natures, and against ignorance, and against hatred, and against the easy way. For just as we struggle to prove our skills against each other on the field, do not you also struggle to improve your skills, and to do those hard yet necessary things? And I say also: we fight against each other, for so do we push our friends to improve, and they push us, and so we all rise by holding up each other; but lo we do fight against ourselves as well, for to become better than we have been and than we might otherwise be. And this fight ends not, for always is the temptation to lay down and to give up. But while we may at times need rest to restore our strength, and be wounded by injury or by illness or by age, it is not by mere effect that we shall be judged, but by whether we fight with what we have against that which is wrong, or whether we discard our arms and disdain the good.”

And the others listened well, and thought upon this speech. Then the second one moved. That one raised a morsel of chocolate to their lips before speaking, and I saw then in my mind fine embroidery, and I saw shining armour, and I saw a kingly feast for multitudes, and I saw masterfully crafted items of wood and metal and leather and paper and glass and cloth and sugar and ink and paint, and I saw a teacher before students, and a student before a teacher, and more books than shelves to keep them, and at the heart of all these images was a single person studying and practising. My guide then spoke soft, saying: This one is the Laurel, who both teaches and is taught. Hear their words!

And the Laurel said: “Well said, and well argued, with fine words and passion and sound logic. And yet, I feel that you have missed the point, for it is skill itself which allows you to strive so well. Skill with words to argue your case, skill with weapons to win your battles. And that is at the heart of the Society: Skill. For it is by skill and knowledge that we improve in all things. Skill in the esoteric and in the mundane. You struggle indeed, as do we all, but I say that you struggle to improve your mastery: for ignorance is the enemy, and it is through study, and learning, and practice that we conquer ignorance. Combat is a craft and an art. And one can help others better the more skilled you are,” – and this was said to the third one there with a nod and a smile – “but it is through learning from others, and studying and practicing of one’s self, and through the teaching to others that we grow. And all these parts are important, I declare this to be true from my certain experience, and all our experiences, soothly. We must learn from others, for there is always something we may learn no matter how much we know already. A statement from

a child may shock an old master into new insights, an approach they had not thought of before. Through teaching, not only do we share our knowledge, but we are there forced to understand our subject so much better. One does not really understand a thing completely until one can explain it to another. But we do not teach for glory: the point of teaching is not to sit before a class and dole out dregs in return for attention and praise, the point is to find others who love a subject as much as you do, to raise their skill until you can discuss your subject with them deeply and broadly, as peers in the original sense: for being the single best and only one of a skill is a lonely thing, and great indeed it is to share the thing you love to do with others who understand. And in study and in practice, in these we do not just improve ourselves but the whole society, for how else may we learn new things? In study we extend what we knew, and find that things we thought we knew were wrong, and thus remove error, and in practice do we learn how a thing is done, and how best a thing is done, and why it is done that way, and what are the failings of doing it otherwise. And this also I say: teaching is, itself, a skill, as is learning. Thus, even becoming better is a thing which can be taught, and learned, and studied, and practised, and improved upon.”

The other three nodded, and sat back, and pondered these words. Then the third of them leaned forward again. And I saw many things then. I saw someone with a lantern at night, I saw someone carrying supplies, I saw someone with a broom in the bright incongruous light between the end of a feast and sleep. I saw yet further someone with paperwork, someone talking to others, someone making sure that this person knew to talk to that person, and I saw events falling into place so smoothly that none else even saw the person who had made it all happen, but they thought nothing of it, and that person saw their ignorance and was glad. My guide then said that only I could hear: This third is the Pelican, who puts others before themselves. Attend them!

The Pelican took a bite of cake, and spoke gently yet firmly, saying: “There is truth in what you say, cousins, but that is not the heart of what we do, for the heart of the Society is in service. For those who fight do not fight alone. What of those who set up the field, who run the list, who call the bouts, who bring water, and who tend injuries? What of those who helped you with your armoury, that the fighters should have designs under which all could know their prowess? What of the marshals who watch the bouts, the official who notes that the paperwork is up to date, the reeve who ensures that the event is paid for, the constable who keeps everyone safe? The assistants in the kitchen, the steward in the hall, the person who sweeps up when all have finished their revelry and the feast is done? There are those who work to not be seen, for the best sign of a job well done is that none even noticed that it had been done, though they would surely know if it

had not. And I say that this is not alone the work of the few, but the work of the many which keeps all running. For all, from the newest guest at their first event, up to the king himself, may take up a broom at the end of the night. All may take some office: whether a child running errands at an event, or the very status of monarch itself. For if all lend a hand, then the work for all becomes easier, and with enough backs beneath it, any burden can be lifted. For why do we struggle, if not to improve things? And why do we study, if not to make things better? Without those who work, there would be no society within which to fight, or for which to make things. And I say this also: that selflessness is not abnegation. For while we may do things for others, we cannot forget ourselves either. If we should burn ourselves out, like a candle in an oven, then we are of no help to others or to ourselves. So, to be of most help, sometimes we must perforce rest and rely on others to help us. And so, sometimes the best and most effective person is not the one who does everything, but who organises, and who makes it possible for every person to help each other. And in this way, all is improved, and the fight is made easier, and the skills may be raised even higher.”

And all four were silent in thought thereupon. But frowns were upon the faces of the Peerage Martial and of the Laurel.

“You speak true,” said the Laurel at last, “but yet I ken that all these things you speak of are skills. For helping others is the height of nobility indeed, but yet do we not study and practice helping itself? For the keeping of the treasury is a skill most keen, and to organise people, whether as a seneschal or a steward or a list-keeper or a feast-cook, this is also a skill which may be practised and learned.”

And the Pelican was about to reply, when the Peerage Martial spoke, saying “but even so, whether it is in skill or in service, is it not the struggle in us which allows these things? Is it not that we strive against laziness, against that serpent of an idea which whispers to us ‘someone else will do that’? For there is temptation to be fought: the temptation to leave the work to others, to never try a new thing, to allow things to be as they are even if they need change to be better, and to change things instead of doing what is needed to make it work? It is that effort which drives learning, and from which we do the work instead of leaving it to others.”

“Ah,” replied the Pelican, “but if not for helping others, then why else the struggle?”

“I disagree,” said the Laurel. “For it is by study and practice that we both fight and help better.”

And I saw these three great people, who were also yet but people, start to raise their voices. For they were all friends, but each was arguing a different view, and each thought theirs the correct view. And the fourth, the last, shifted in their chair. And the other three drew silent. Then did I see a sword, and a rose, and thrones, and duty, and the memory of the weight of a crown. Lo, said my guide, there sits the Royal Peer, who is brother of the Peerage Martial, for they have much in common, but along with having been the Monarch by Right of Arms, they were also Monarch by Grace, and they have both fought, and been fought for. Pay heed!

“My friends, my cousins,” said the Royal Peer, “I pray ye peace. For all you say is true. We fight against laziness and ignorance and unworthy instincts as much as we contend against each other in friendly combat. We study and practice to improve all things, with theory and knowledge and skill, to know things and to do things and to make things, glorious things and mundane things with art and with craft and with love. And we help each other, for it is in helping each other that everyone’s burden is lessened. But these things are not the heart of the Society, for the Society is people, and there is nothing magical about people, and yet there is something gloriously magical about people, and it is this: people can be anything. And what we do, we four, is to be examples of what can be done. For we are Peers, cousins, and while we are looked up to, it is incumbent on us to remind others that we were not always thus. We once were wide-eyed and wondering at our first event, blinking in the candlelight. And we strove, and we learned, and we helped and were helped in return, and we are become Peers in our various fields. And as we have done, so can they. We have a heavy duty, cousins: we show the way for others to follow, if they will it. And not all will follow us all the way, nor should any expect them to. This is not a thing we can force on anyone, because a forced thing is quickly hated, and if they hate the society, then they will likely leave it, and we all are lessened. There are many who wish for nothing more than to dance and play and feast and fight and be amongst their friends, and that they can do so is something for which we all are working. But some will choose to take a skill and master it, or to work for others because it is the right thing to do, or to take up combat and test themselves against all comers with good grace and honour, until they may be counted amongst the best of all. And we, who are held as the best, are their beacons. For by treading the path do we help others to reach our standard? By being known as Peers, we guide others in their behaviour, and this is heavy indeed, for if we ourselves should stray from honour, then we shall draw others along with us, and then we should encourage not pride in good works, but pridefulness in personal status, not confidence, but arrogance, not chivalry, but hollowness. What is at the heart of the Society, old friends, is to set the example, to be the person you would wish to see raised high, to show that courtesy and chivalry and honour, and skill and courage and

selflessness, are all possible, and that all can attain these things. There is the heart: Inspiration. Struggle and Skill and Service are all means to this goal – three legs of the one stool. For while any of the legs is not the whole of the thing, without any of those legs the whole of the thing would be broken.”

And there the four sat, heavy in thought. And at length, they looked up, and saw that my guide and I were standing there, and the Royal Peer said “Friends! These were not private deliberations, but an old argument which we have had before and will have again, and I hope you have been enlightened and entertained by it. Please, join us at this fire, for it is warm, and all are welcome!”

And we sat with the Peers, and the Peer Martial passed around strong beer, and the Laurel passed around dark rich chocolate, and the Pelican passed around sweet cake, and we told tales, and the Laurel told a ribald joke, and the Peer Marshall recited a poem, and the Pelican led us in song, and the Royal Peer taught me a trick in a craft I was curious of, and all gave me sage advice and listened to my thoughts with solemnity, until my guide advised that we must move on. and I... *the fragment ends here*



Parliament of King Edward. Image from

https://commons.wikimedia.org/wiki/File:Medieval_parliament_edward.jpg

An Introduction to the Heavens

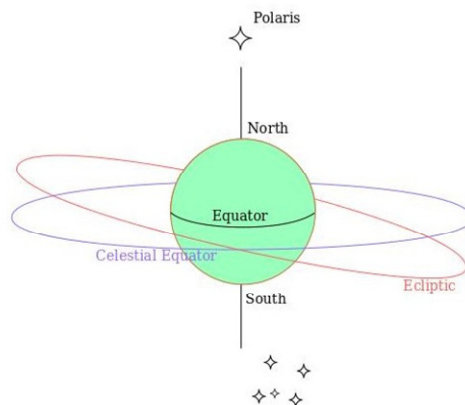
Nathanael d'Avranches

Let there be lights in the vault of the sky to separate the day from the night, and let them serve as signs to mark the seasons, the days and the years. Genesis 1:14

This is the first part of a series of articles I intend to write on period astronomical devices, their functions, and how to make them. This first part will serve as an introduction to the sky and explain some of the terminology that period astronomers used.

When you go outside and look at the stars in the sky, you see the universe overhead stretched into a sphere around you. From ancient times the revolution of this sphere about the earth has been intricately linked to the passage of time: the sun rises and sets: a day; the moon goes from new to full to new again: a month; the sun progresses through the four seasons on its path through the zodiac: a year. These signs could be used to determine when to plant, when to harvest, and the timing of certain sacred days (most notably Easter).

Every day, the heavens appear to make a full revolution about the earth. They are fixed on an axis running through the north and south poles of the earth, and it is about this axis that they spin. Directly above the North Pole of the earth stands the star Polaris. It serves as the North Star and the whole northern sky appears to rotate about it, while it stays fixed. Here in the Southern hemisphere there is no "South Star" at least not one that is bright enough to see. Instead the sky rotates around a point that the Southern Cross points towards. The Southern Cross (and the constellation Centaurus) rotate about this point like a clock, with a full revolution representing one full day of time. Other stars that are further away from this point then appear to rise and set as their rotations carry them beneath the horizon.



The rest of what were called the *fixed stars* rotate overhead in a similar way. They always have the same location relative to the other stars in the sky, so the shapes that they make are recognizable as constellations. In contrast to these are the *wandering stars* (planets). They look like bright stars, but are notable because they do not remain in the same location of the sky, instead wandering through the sky. There are five planets that we can see from Earth without aid, and were known to the ancients. They are Mercury, Venus, Mars, Jupiter, and Saturn. Along with the Sun and Moon, called the *luminaries*, these make up the seven celestial objects in our solar system known before the invention of the telescope.

Although the planets and the luminaries do not remain fixed in the sky, neither do they move about randomly. Each of them lies on a great circle called the ecliptic, which is the plane of the solar system. Each of the different objects has a different pattern of motion around this imaginary circle. The sun has the most consistent path around, taking one whole year to make one revolution around the circle. It moves at nearly a constant rate all the way around, which means that it progresses almost one degree per day (taking 365 days to move 360 degrees). The moon also moves at a constant rate, but much faster. It moves at a rate of about 13 degrees per day, taking 29 days to complete a revolution. The other planets have more complex patterns. Mercury and Venus follow the sun around its path, looping back and forth in the night sky to appear sometimes before the sun, and

sometimes after it. Mars makes a full orbit every 2 years, independent of the Sun. Jupiter takes 12 years to complete a cycle, and Saturn takes 30.

The ancients divided the ecliptic into 12 equal parts (signs) and named them after the constellations in their vicinity. Therefore, we have the signs Aries, Taurus, Gemini, Cancer, Leo, Virgo, Libra, Scorpio, Sagittarius, Capricorn, Aquarius, and Pisces. Each of these signs occupies 30 degrees in the sky, to total 360. The locations of the planets can thus be described by a position on the zodiac: the first degree of Taurus for a planet or luminary just entering the sign of Taurus, the fifteenth degree of Capricorn for one in the middle of Capricorn.

Because the sky is rotating, it is difficult to record the position of a stellar object in a way that is meaningful to another observer. The sky was therefore divided into degrees similar to the latitude and longitude of the surface of the earth. The degrees around the celestial equator were referred to the same as the ecliptic (e.g. by the zodiac sign), while the height above or below the equator were referred to by *declination*, given in degrees. Therefore an object could be at 23 degrees of Cancer, 64 degrees of declination.

There are many period works on the stars and their orbits which can be found in translation. One of the best period works on Astronomy, in my opinion, is Bede's *De Temporibus*, which was written in Anglo-Saxon English in 725AD. It describes several natural phenomena related to the heavens: the tides, the seasons, and the size of the earth, sun, moon and stars.

In subsequent essays we will explore converting from local coordinates to degrees of ecliptic and declination, the use of the quadrant and astrolabe, and the construction of these tools.



Contributors

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Baron Brían dorcha ua Conaill is an early 11C Irish scholar who was studying in York before being made Baron of Stormhold.

Baroness Adelindis filia Gotefridi lives in the Canton of Lightwood in Ynys Fawr. Her research interests are wide ranging, eclectic and constantly evolving, but she has a particular interest in early (sometimes very early) period costuming across various cultures and regions. She is also a singer, and occasional songwriter.

Lord Ælfred se leof is a dancer, brewer and occasional fighter from the Kingdom of Lochac, currently living in an outlying and desolate region of the Barony of the Far West. He's interested in hearing from anyone in Singapore or nearby -- contact him at nps@nps.id.au.



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