

## OF WOOD AND WORM

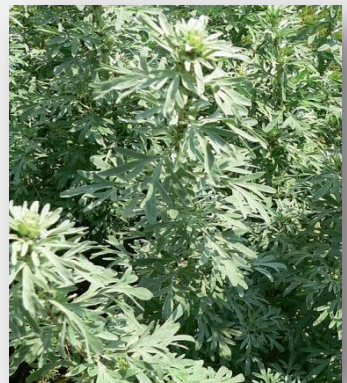
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"For as physicians, when they seek to give  
Young boys the nauseous wormwood,  
First do touch the brim around the cup with the sweet juice  
And yellow of the honey, in order that the thoughtless age of boyhood  
Be cajoled as far as the lips, and meanwhile swallow down  
The wormwood's bitter draught, and, though befooled,  
Be yet not merely duped, but rather thus  
Grow strong again with recreated health." Lucretius, On the Nature of Things Book

The name of the family farm on my father's side is 'Wildealslaagte'. The name means 'valley where wildeals grows'. Here, narrow shady valleys are engraved into a vast landscape of grey hills speckled with white sheep and even whiter stones. From these valleys, shrubs of African wormwood or *wildeals* send a Delphian fragrance into the summer air. The hardy *wildeals* bushes, with their woody stems and silver leaves, are the oldest and best known medicinal plants in Africa. *Artemisia afra*, the African version of *wormwood*, grows right through Africa, from the Cedarberg Mountains in the South Western Cape to as far north as Ethiopia.

As children, we were well aware of the plant's medicinal qualities. We would respectfully avoid damaging the plants, but could not resist breaking a twig or two to release the gluey sweet oil, which, to a child's imagination, was reminiscent of menthol toffees. When we had a cold we would roll leaves and put them into our noses, usually with great results. The leaves were also very effective at stopping our feet from sweating in our shoes during long walks through the veld. Most impressive was how well the leaves would clean our cuts and scratches.

However, we also did our best never to complain of stomach ache, for this guaranteed a dose of the mercilessly *bitter tea*, brewed from the leaves. The bitterness was enough to scare us into sudden health, irrespective of how much honey would be promised on the side. That is, unless the image of "...long white worms..." inside our bowels won the day and we swallowed it with clenched fists. Adults, of course, would freely smoke the leaves and drink '*wildeals brandy*' at the first signs of stomach discomfort or fever.



**Today, wormwood, a hormetic phytochemical, is still part of everyday living, whether in the smoke of the African hunter's fire or in the liqueur from a Fifth Avenue cocktail bar.**

*goddess of the moon...*

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"...that liquor of honey or milk  
Yields in the mouth agreeable taste to tongue,  
Whilst nauseous wormwood, pungent centaury,  
With their foul flavour set the lips awry;

*Thus simple 'tis to see that whatsoever  
Can touch the senses pleasingly are made  
Of smooth and rounded elements, whilst those  
Which seem the bitter and the sharp, are held  
Entwined by elements more crook'd, and so  
Are wont to tear their ways into our senses,  
And rend our body as they enter in..."* Lucretius, (Roman philosopher. 99-55 BC)

The *Artemisia* genus is from the Aster family and there are at least 400 species of *Artemisia* or *wormwood* all over the world. *Artemisia* probably refers to the goddess Artemis, although some scholars think it was named after the wife of the Greek/Persian King Mausolus, Artemisia, who was exceptionally knowledgeable about medicinal plants. Whatever the source of the name, medical preparations made from *Artemisia*, like the original earth goddess, have restorative and life saving capabilities which have led to the formation of a special bond between humans and these plants through the ages.

Even the name *sagebrush*, often used for the genus to indicate the grey-green colour of sage, reminds us of the 'sage-like' wisdom of the goddess.

It is thus no surprise that the hormetic oils in *Artemisia* plants are known to have been part of the human mythological and

The name of the goddess Artemis relates to *artemês*, which referred to her healthy vigour and her ability to supply the same healthy strength to others. She was a moon goddess. As huntress, she was a tall, nimble maiden who carried a bow and quiver (or spear) and was accompanied by dogs. As sister of Apollo, she could send plague and sudden death among humans and animals with her bow and arrows. At the same time, she was the protector of children and animals and could cure and alleviate the suffering of all mortals. Her gracious acknowledgment of a particular human's life would ensure that death for that person would happen only in old age. In Roman mythology she was known as Diana.

healing world throughout our history. Wormwood was burned as an offering to the gods. Shamans, druids, priests and philosophers have sung its praise all over the world. An Egyptian text of 1552 BCE refers to the use of wormwood for its ability to kill worms and cure headaches. In an early Greek text, Dioscorides also described wormwood's ability to expel intestinal worms. The goddess Isis brewed a concoction from the poppy plant, wormwood and honey to cure the divine headache of Ra, the greater god of the heavens. Ancient Greeks saw it as a star which fell into the waters of the earth and made them bitter. Egyptians, Greeks and Romans also used wormwood as a love potion and as an important component in religious rites. The Greek philosopher Pythagoras counselled women to use wormwood to ease labour pain, while Hippocrates advocated it for menstruation pain and arthritis.

In Traditional Chinese medicine, herbal tea from wormwood, *qing hao*, "*clears heat from the system*". This clearing of heat is equivalent to its use as an anti-febrile (fever reducing) agent in malaria and bowel infections while maintaining mental alertness without irritability and exhaustion. Again it reminds us of the feminine qualities of the goddess, full of vitality herself, but able to tone down harsh energy. It is also protective of the '*liver and heart systems*' as defined in Chinese physiology, and can, for example, stop nose-bleeds and reduce blood pressure. The aromatic oil, applied on the skin can also relieve arthritic and nerve pain.

In Africa wormwood has relieved colic, cleaned wounds and helped people to resist parasites like malaria since the beginning of human history, and in the Americas traditional healers used it for lung infections, sore throats and colds.

Today wormwood's soothing effect, based on its ability to reduce fever responses, is still used in contemporary herbal medicines. In fact, a major pharmaceutical company is busy developing a modern drug against resistant malaria, the most dangerous 'fever' of our time that kills thousands across the world every year.

Some of the large pharmaceutical companies are presently researching African wormwood, which seems to be effective against malaria parasites, especially some of the resistant types. Researchers have found seven flavonoids in the extract of *A. afra*. Three of them, namely acacetin, genkwanin and 7-methoxyacacetin, showed in vitro activity against both the chloroquine-sensitive strain (PoW) of *Plasmodium falciparum* and also against the chloroquine-resistant clone, Dd2. A hydro-distilled volatile oil from the aerial parts of the plant has shown antifungal activity against many fungal species such as *Aspergillus ochraceus*, *Candida albicans*, *Alternaria alternata*, *Geotrichum candidum*, *Aspergillus niger*, *Penicillium citrium* and *Aspergillus parasiticus*. The traditional use of *A. afra* for TB was also examined in research studies which have found that the 5,7,2-trihydroxyflavone in the plant has significant activity against *Mycobacteria*.

In a bio-analytic sense, it is especially the toning down of certain aspects of our autonomic nervous system that relates to the nurturing aspect of the goddess. Wormwood reduces spasm in the smooth muscles of our digestive system, causes a fall in blood pressure, slows down pulse rate and deepens breathing. In other words, it interacts with the [acetylcholine](#) feedback cycles of the autonomic nervous system and may even increase the [bradikinin](#) system which steps in when we are dealing with close and direct physical contact with the outside world.

No wonder that in a modern medical research paper of 1992, Huxley et al. described mugwort (*Artemisia vulgaris*) which is indigenous to Europe, Iran, Siberia and North Africa, as a "...condiment with supposed magical properties..." Behind these magical properties lies the fact that wormwood, like most plants used as herbal medicine, contains many active ingredients, most of them to sustain the plant cells, but also others to ward off anything that may hurt the plant from outside. One such defensive toxin is *thujone*, which gives the bitter taste which plays an archetypal role in many myths.



***It is indeed the thujone and isothujone in the oil produced by wormwood that brings us to the 'mysterious' effects of wormwood.***

*virgin huntress...*

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*"The name of the star is Wormwood. One-third of the water turned into wormwood, and many people died from the water because it had turned bitter." Basic English Bible 2008, Revelation 8:11.*

In the Old Testament of the Bible, the bitterness of wormwood was mentioned to indicate affliction and punishment, and in the medical astrology of the Christian Middle Ages wormwood was the herb of the planet *Mars*. It could thus treat complaints related to Mars such as wounds, inflammation and infection, fever and blood ailments, liver conditions and mental abnormalities. Here qualities of the goddess appear that are the opposite of her soothing and protective nature and closer to the Artemis of later times, when she was mainly a goddess of hunting and the twin sister of the god Apollo. Now she exemplifies independence and protects the solitude of the inner world with fierce, untamed nature – qualities that make sense in a conscious world that respects individualism and even accepts a concept such as emotional *'re-birth'* as part of personal development. The one-eyed Cyclops made silver arrows for her bow as counterpart to the golden arrows of her brother; and Pan, a god of the forest, increased her natural strength by giving her hounds for her hunting activities. What is important to note, however, is that although she carried the focussed clarity of a hunter, it was deeply ingrained in the symbolic preferences of nature – her virgin shyness, silver 'moonbeam arrows', and the unsettling energy of her hunting hounds. Her insight embraces paradox and ambiguity and her influence can kill as easily as it can enlighten.

This archetypal paradox is visible in modern myths where wormwood appears in the guise of one who entices towards difficult and contradictory choices. For example, in *'The Screwtape Letters'* by C.S. Lewis, a senior demon called *Screwtape* tells the junior trickster named *Wormwood* to tempt humans by making them attend to "the stream of immediate sense experiences" rather than to rational debate. Even the character of Miss Wormwood in the Calvin and Hobbes cartoons echoes this when she always frustrates Calvin's carefully planned mischief, a bit like a reversed trickster.

In modern medical metaphor research into wormwood brings forth the paradox of cognitive focus and creative zeal in one chemical package. This also explains the conflicting claims for wormwood in the avalanche of herbal remedies that have appeared on the market. Measureable changes in neurotransmitters have confirmed that wormwood causes baffling and ambiguous stimulation where it comes to brain activity. What is clear, though, is that its stimulation of the

Is there a meaningful coincidence in Anna Banti's twentieth century novel, *Artemisia*, based on the life of the Italian painter Artemisia Gentileschi? Here the writer wove together their lives - two women, the writer and her subject, who both created against the odds of patriarchal rivalry and desperately wanted to become more than mere pawns in a world limited by physical and psychological abuse of women. Artemisia Gentileschi's most famous painting, *'Judith and Holofernes'*, depicts a scene where Judith hacks off the head of her 'rapist' while he sleeps. The bracelet Judith wears is a depiction of Artemis. (Perhaps this is a sensitive reminder of the goddess Artemis, who with her spear and hunting dogs, could bring sudden death if not respected for her natural qualities.)





brain could also damage and threaten survival as an independent identity. This reminds us again of poor Actaeon, who saw Artemis naked and was transformed into a stag by her silver arrows, only to be devoured by his own hounds.



***This spells out the danger of wormwood: to the naive excitement seeker it may release untamed emotional responses with destructive feedback cycles in the autonomic nervous system.***

### *la fée verte*

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*But him neither the chase nor comradeship in archery on the hills shall save in that hour, when, albeit unwillingly, he shall behold the beauteous bath of the goddess. Nay, his own dogs shall then devour their former lord. And his mother shall gather the bones of her son, ranging over all the thickets." - Callimachus, Hymn V The Bath of Pallas 106.*

This brings us to the main argument for our article: herbs like wormwood with their ...*"bitter and sharp natures tear their ways into our senses..."* and hormetically entice an overwhelmed system to stand its ground and create a new

coherent identity.

During the Romantic era of the nineteenth century, the demonic and heroic became intense personal identifications. Think of Mary Sheley's Frankenstein, Herman Melville's captain Ahab, Goethe's Faust and Emily Brontë's Heathcliff. Artists were obsessed with the liberating ferociousness that emerged from the untamed revolution of the people. However, when the purging violence of populism during the early and mid nineteenth century failed to 'restore an outer paradise', they turned to the inner world. With the help of Freud they sensed an inner brutality in themselves which they believed could eventually enforce a new world and change the human condition. We could say that they found an inner or psychological 'hormetic' spectrum ranging from enthusiastic expectation to accepting the unavoidable tragedy. Their intolerance for control and restraint in the outer world was now combined with the passionate search for a personal encounter with good and bad, safe and toxic, within one container – one inner self. In other words, they turned to an *'imperfect living nature'* to lead them to greater heights of existence.

To be brave enough for this journey many of them turned to a 'substance with magical properties', the enticing green fairy in the shape of absinthe. Hemingway describes this "Death in the Afternoon" cocktail as follows: "...Pour one jigger absinthe into a champagne glass. Add iced champagne until it attains the proper opalescent milkiness. Drink three to five of these slowly..." Oscar Wilde is more specific about what to expect: "The first stage is like ordinary drinking, the second when you begin to see monstrous and cruel things, but if you can persevere you will enter in upon the third stage where you see things that you want to see, wonderful curious things."

Absinthe and vermouth were well known alcoholic beverages of their time which contained oils from

The short history of absinthe is as *lunatic* and *metaphorical* as its effects on nineteenth century bohemian users. A French doctor with the name of *Pierre Ordinaire* created a patent remedy from the wormwood *Artemisia absinthium*. Two sisters eventually acquired his recipe, but their medicinal mixture landed in the hands of an army major who saw a great opportunity in distilling the elixir into an inexpensive alcoholic drink. Soon we had the Pernod dynasty, based upon this *emerald liquor*. Although much has been written about possible antimony and copper use, the essential green colour of the real product came from the chlorophyll in the leaves of wormwood and other herbs which were added at the end of the process.

wormwood. Absinthe, the sought after green fairy, was prepared by distilling a wormwood 'brandy' into a liqueur containing up to 70% alcohol. Some critics say that the magical property that ensnared the artists and writers into the notorious absinthe web was nothing more than an obsession with alcoholic intoxication. Rationally it makes sense that if the mystical absinthe effect of

bohemian Europe was mere alcoholic fervour we can assume that the alcohol would take hold of the brain in the early stages, giving an effect of ordinary drunkenness.

However, I find it hard to believe that highly intelligent people could not distinguish between simple intoxication and something that enticed them into inspirational devotion. The rites for drinking absinthe were reverential and many of the followers of the green goddess professed to a clear-headed drunkenness, a sense of lucidity that was a glorious inducement of creativity. Again, modern sceptics could argue that these rituals were merely about the realistic need to make the bitter and strong alcoholic taste palatable, but most rituals are, in any case, based upon the desire to integrate the practical needs of the body with a mythical experience of the unknown. In the Parisian bars everybody had personally designed perforated spoons for the cube of sugar through which a fountain of ice-cold water was added into the absinthe glass (this was called *louching*, a process which changed the clear green drink into an opaque cloud of sea-green and white milkiness.)

Read more about absinthe on <http://www.oxygenee.com/>. Especially take the time to see how the different artists depicted their glasses with absinthe.)

Oscar Wilde, Baudelaire, Rimbaud, Ernest Hemingway, Vincent Van Gogh, Edouard Manet, Degas, Toulouse-Lautrec, Pablo Picasso, and Paul Gauguin all pledged eternal allegiance to this symbol laden

muse, and something urged them to persevere every time until they entered a stage when they started to see "...wonderful curious things."

***The fact is, those archetypal patterns which guide us towards the creative force that lies in opposing qualities can easily be observed in the absinthe tradition.***

*emerald wisdom...*

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Any aspect of nature that becomes linked to our mythological sense of mind carries archetypal influence and will always strengthen of our personal



symbolic interpretation of an experience. As in most cultures and since the beginning of the human era of reasoning at least, people, especially artists and philosophers have strived to move outside the tension zone of opposites. Art and religion teem with symbolic depictions of ways to find the point beyond division -just enough to taste omniscience and immortality without succumbing to self-destruction - ways to re-awaken the *Hermetic truth of the Emerald Tablet*.

Most Bohemian Europeans no longer had a clear-cut religion to sustain a secure sense of collective identity underneath their new world of free individual thinking. Consciously or unconsciously, they reached back to the alchemical influences from Egypt, Greece, India and the early Renaissance to share and connect the diverse experiences of an unpredictable inner world. Absinthe was a perfect ritual way to embody these archetypal patterns and to define the inner reality that "*By this means you shall have ye glory of ye whole world & thereby all obscurity shall fly from you.*"

Hermes Trismegistus, (Hermes, thrice greatest) a legendary Egyptian sage or god, associated with both Thoth, an Egyptian god and Hermes (the Greek god) was seen as the creator of the Emerald Tablet. Legend has it that Alexander the Great found the stone on which the universal text on transformation was carved in Egypt in 331BCE. Whatever the origin, the text became an archetypal example of the evolution of human consciousness. Even CG Jung said that he found his inspiration for defining the concept of collective unconscious in the Hermetic tablet. Here is the translation of the text in the words of Newton: "Tis true without lying, certain & most true. That which is below is like that which is above & that which is above is like that which is below to ye miracles of one only thing. And as all things have been & arose from One by ye meditation of One; so all things have their birth from this One thing by adaptation. The father is the sun, the moon its mother, the wind [air] hath carried it in its belly, the earth its nurse. The father of all perfection on ye whole world is here, its force or power is entire if it be converted to earth. Separate thou ye earth from ye fire, ye subtle from the gross sweetly and with great industry. It ascends from ye earth to ye heaven & again it descends to ye earth and receives ye forces of things superior & inferior. By this means you shall have ye glory of ye whole world & thereby all obscurity shall fly from you. Its force is above all forces. For it vanquishes every subtle thing & penetrates every solid thing. So was ye world created. From this are & do come admirable adaptations whereof ye means [or process] is here in this. Hence I am called Hermes Trismegistus [the thrice illustrious], having the three parts of ye philosophy of ye whole world. That which I have said of ye operation of ye sun is accomplished & ended."

Finding a reality where "*...that which is below is like that which is above & that which is above is like that which is below to ye miracles of one only thing...*" was essential to a world where Darwin and Freud placed the ability to understand and overcome the dualistic nature of our existence squarely in the hands of every individual. The green colour and its change into white were an important part of the symbolic amplification associated with absinthe, which like all hormetic substances, stimulated 'unconscious' acknowledgement of nature's dualism. Although modern sceptics would argue that the absinthe rituals were merely about the need to make the bitter and strong alcoholic taste palatable, we must remember that most rituals are in any case based upon integrating the practical needs of our body with the mythical experience of the unknown.

So, although many have argued, and still do, that there was '*brain damage*' in certain regular users, caused by the alcohol or possible heavy metals mixed into the absinthe, the main substances in wormwood oil and their ability for 'hermetic' double play should always be considered. In other words, we may still have to thank absinthe for Vincent van Gogh's *Starry Night*. After all, he was never warned to

abstain from absinthe in spite of his psychological breakdown. And those who have felt nothing apart from being drunk? Did they merely lack imagination or did they have a different relationship with wormwood?

We will never know.

**Hormesis, however, could at least widen our perspective.**

*Orion's fate...*



*"I flow forth, by divine decree and  
Assisted by the Art, as a healing giving medicine.  
He, who is able to, drinks out of me.  
He, who wants, purifies himself in me.  
He, who dares, jumps into my depths. Drink, brother,  
and live..." Chymische Hochzeit, Christiani  
Rosencreutz*

Today most scientists refute claims of unusual clarity of mind and creative feelings, on the premise that the amount of the main active substance from wormwood, *thujone*, was not high enough to cause

clinical neuro-stimulating effects. However, in none of the research papers have I found any acknowledgment of a hormetic interaction between humans and wormwood. The subtle stimulating effects of a low dose of wormwood depend on the essential background against which this interaction with wormwood happens. In one person, the neuro-stress response created by *thujone* in alcohol would have been a creative lucidity, in another, disastrous psychological disintegration. To some, a small amount of wormwood could bring a cheerful mood, sharpened perception, and creative energy, to others it was a simple case of alcoholic dissolution.

Absinthism, described by doctors as excessive excitability, hallucinations, and epileptic fits, could have been the outcome of wormwood becoming a hormetic poison, while all that the lucky ones experienced was a perfect balance between creative fire and natural instinct. In other words, like most hormetic substances, certain dosages of wormwood in certain people promote health and functionality by '*stressing*' our nervous and immune system into effective adaptation strategies. They push our system to cope and create by selectively imposing stress on specific parts of our nervous and immune systems.

Wormwood has cholinergic receptor binding activity, and has the opposite effect on GABA receptors to alcohol, phenobarbital and diazepam (thujone has been shown to act as a GABA type-A receptor antagonistic (Höld et al., 2000). The modulation of [gamma-aminobutyric acid](#) (GABA) type A receptors (mainly inhibition) by  $\alpha$ -thujone may contribute to wormwood's psychoactive effects, particularly when co-administered with alcohol, as in absinthe. High levels of thujone could cause "a detectable to major inhibitory effect beyond that of the ethanol content". Research has also suggested that  $\alpha$ -thujone reduces 5-HT<sub>3</sub> receptor activity via receptor desensitization with a resultant inhibitory action on serotonergic responses. In the liver,

Because this hormetic effect is largely ignored in modern studies, research is all about which levels of *thujone* will cause overt clinical effects such as convulsions. If the levels of individual chemical substances are below these values, they are medically considered as having no effect. In other words, to a twentieth



century one-dimensional frame of mind, the romantic mystique which went with absinthe was ridiculous fantasy. In the present century, however, we are slowly becoming more aware of dynamic networks, and the psycho-neurological links that make it easy to understand the seemingly erratic responses of absinthe drinkers to the outer world.

Now does it make sense that Orion, the earthborn, one-eyed god, who in his half blind infatuation with Artemis boasted to kill everything that originates from the earth, was eventually killed by Artemis? Up there in the Southern sky he is still a reminder that the true hero is not the one who forces nature into submission, but the one who can cope with her unpredictability.



***Modern science, especially health science, may do well to dispense with its half-blind obsession with what can be 'taken and controlled' in nature and the natural body, and finding a new relationship with the demonised and discarded green goddess.***

*of wood and worm...*

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The absinthe episode in our recent history also reminds us that our interaction with plants and their chemical substances is way too multifaceted to be explained by one-dimensional research techniques. Our interaction with certain plant substances is always more than a simple chemical reaction between two or three known molecules. It can never be a case of simply comparing low and high dosages. In other words, where it comes to these natural plant substances, the situation is too complex for merely finding a toxic dosage, below which all is fine and above which it is dangerous.

In archetypal imaging, we could say that hormetic plant substances are the worm and the wood, the serpent and the tree of life. They destroy and keep together, provide protection and growth, but only when used with respect and insight. The oil of wormwood is a perfect example. Different dosages can have outcomes that are so different that they can have opposite consequences. It kills parasites and body cells in one situation, but generates creative forethought in another. However, even its creative side can get out of hand and cause convulsions and brain damage. The network of feedback activities between our system and wormwood is typical of our interaction with nature.

To understand the effect of plants – as food or medication - in our system, we have to explore the full range of interaction between our system and these substances: chemical, psychological and mystical.

***It is especially important to rethink our symbolic relationship with plants and never forget that over the course of many ages plants and humans have developed natural, complex arrangements through which they interact for the benefit of both.***

Images used are from <http://commons.wikimedia.org>

- Artemis <https://www.romanoimpero.com/2009/12/il-culto-di-diana.html>
- 'Judith and Holofernes' <https://www.uffizi.it/en/artworks/judith-beheading-holofernes>
- Henri Privat-Livemont's 1896 poster [https://commons.wikimedia.org/wiki/File:Privat-Livemont\\_-\\_Absinthe\\_Robette,\\_1896.jpg](https://commons.wikimedia.org/wiki/File:Privat-Livemont_-_Absinthe_Robette,_1896.jpg)
- An imaginative 17th century depiction of the Emerald Tablet from the work of Heinrich Khunrath, 1606. [https://commons.wikimedia.org/wiki/File:Houghton\\_Typ\\_620.09.482\\_Heinrich\\_Khunrath,\\_Amphitheatrvm\\_sapientiae\\_aeternae.jpg](https://commons.wikimedia.org/wiki/File:Houghton_Typ_620.09.482_Heinrich_Khunrath,_Amphitheatrvm_sapientiae_aeternae.jpg)
- Daniel Seiter's 1685 painting of Diana over Orion's corpse, before he is placed in the heavens [https://commons.wikimedia.org/wiki/File:Diane\\_aupr%C3%A8s\\_du\\_cadavre\\_d%27Orion.jpg](https://commons.wikimedia.org/wiki/File:Diane_aupr%C3%A8s_du_cadavre_d%27Orion.jpg)
- A reservoir glass filled with a naturally colored verte absinthe next to an absinthe spoon. <https://commons.wikimedia.org/wiki/File:Absinthe-glass.jpg>