



On the etymology of the word iris: from the name of a God to the eye

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Dedicated to Prof Jay M Enoch

The word iris comes from the ancient Greek [Ἴρις – *Iris*]. First, it was the name of the messenger God in the *Iliad* of Homer embodying the rainbow. Later, with the transit of the myth to the logos in the birth of Presocratic philosophy, the meaning turned into a meteorological phenomenon. Afterward, a crucial step occurred at some time around the 1st-2nd century CE when Rufus of Ephesus, probably for the first time, used the word with meaning in eye anatomy. Both meaning transitions were bounded to metaphorical thinking. This article reviews the long history of how the word iris evolved along this fascinating route. © Anita Publications. All rights reserved.

Keywords: Iris, The etymology of anatomic terms, History of ancient optics, Meteorological phenomenon.

1 Early etymology of the word iris

[Ἴρις – *Iris*] appeared first in the *Iliad* of Homer as a deity in which the rainbow, as a meteorological phenomenon, was personified; in this case –in contrast to other deities (e.g. Zeus, “cloud-gatherer”)– the name of the Goddess is equal to its appellative. Iris, daughter of Thaumás and Electra and sister of the Harpies, is like Hermes a messenger-God, carrying messages between Gods or from Gods to men. Interestingly, [Ἴρις – *Iris*] was not the only word used by the Greeks to denote the rainbow. The word [τόξον – *toxón*] –possibly from pre-Greek origin [1] and meaning “bow” – was also used, although rarely [2]. Latin writers translated it as arcus, which comes from a different root: *arkwo-.

Plato himself offered an etymological explanation of the word ἵρις in his *Cratylus* (408b): “Iris also seems to have been called from εἶρεν because she was a messenger”. εἶρεν means to speak; thus Iris communicates messages through language. But this is more Plato’s philosophical-literary invented explanation [3] than a real linguistic etymology (see [4] also for the translation). The etymology fiction was also used by later authors. Ptolemy Hephaestion, a Byzantine grammaticus (someone interested in etymological disquisitions) wrote a book (Novel Research), where a new apocryphal mythological character was created (Arce as a sister of Iris) to explain the appellative [ποδάρκη – *podarkes*] given to Achilles in the *Iliad* [5]. The manuscript is lost, but an epitome has come to us through Photius’ encyclopedic work *Bibliotheca* (cod. 190) [5]:

They say Achilles was called swift-footed [ποδάρκη] by the poet, because Thetis put the wings of Arce [Ἄρκη] around the child, and swift-footed means that his feet had the wings of Arce. Arce was the daughter of Thaumás and her sister was Iris; each had wings. During the war between Gods and Titans, Arce flew away from the Gods and went to the titans. After the victory, Zeus removed her wings and sent her to the Tartarus...

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The similarity between Arce and Lucifer is more than suggestive: "the fallen angel" lost his wings as Arce for his disloyalty to God. Also, in some cultures there is a belief that the secondary rainbow –the colors are inverted with respect to the primary one– is the work of Lucifer; for instance, in Germany and Arabia it is called "devil's rainbow" [6].

Nowadays it is accepted that Ἴρις comes from the indo-european root **wei-* (meaning "to bend or turn" p 598 [1]), with the addition of the suffix *-ri* [7]. Thus, the word iris comes from a linguistic construction based on a metaphor, and picture shown in Fig 1 represents iris. The rainbow has two obvious appearance properties: its colors and its bent nature. The latter one gave the metaphorical name.

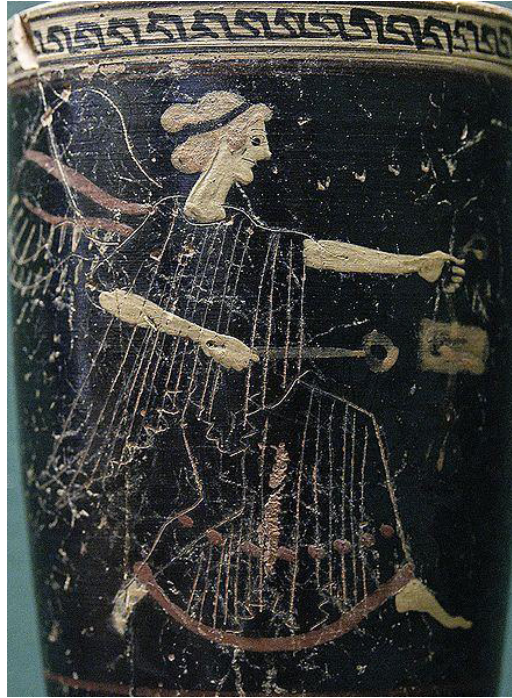


Fig 1. Iris, Attic lekythos in Six's technique (superposed colors).

From Tanagra now in Louvre. Between circa 500 and circa 490 BC. Purchase Hoffmann, 1876. Source: Marie-Lan Nguyen (2010). Wikipedia Commons. https://commons.wikimedia.org/wiki/File:Iris_Louvre_L43_n2.jpg

2 From myth to logos: Iris as the rainbow

The epic shown in the Iliad is the exhibition of the tragedy of men subject to the will of the Gods. The wrath of Achilles, the death of Hector, etc., all occur by divine willfulness. The only possible causal relation is the providence of Zeus. Anyhow, as Auguste Comte stated, the interest in a phenomenon arises first in mythology and religion before it was the object of study of scientific thinking [8].

Starting with the anthropomorphic deities of Homer and Hesiod, which inhabit Mount Olympus, and, therefore, are close to human beings and their avatars, the new Greek religious and philosophical mentality of the sixth and fifth centuries transformed gods ascending them to the heavens –deities of heaven are typical of Indo-European religions. Already the Pythagoreans considered the stars to be Gods [9], which would influence the Platonic doctrine of "visible Gods" [Tim. 40 D]. With Empedocles, this profound religious reform is already manifest: Helios and Selene are the Sun and the Moon as stars (Frgs 40, 45) (p 79 [9]).

The next step in the distancing of Gods from everyday life was established by Presocratic philosophers. They started searching for explanations of natural phenomena through observation and logos. This is the meaning of Anaxagoras maxim: "Appearances (phainomena) are a vision (opsis) of the invisible (adelon)" [Anaxagoras, B21a] [10].

Anaximenes of Miletus (c. 586 – c. 526 BC), the last of the Milesians, was the first (recorded) Presocratic philosopher trying to explain the rainbow phenomena based on logos: "A rainbow is produced when the rays of the sun fall on thickened air" (p 81 [10] 9, see also p 87 [10]). A more explicit contrast between myth and logos is provided by Xenophanes of Colophon (c. 570 – c. 475 BC), a wandering poet and philosopher. He satirically criticized the anthropomorphic Gods of Homer and Hesiod; on Iris he said: "She whom they call Iris, this too is in reality cloud, purple and scarlet and green to the view" (p 125 [10]).

No doubt, the most elaborated naturalistic explanation of the rainbow (among Presocratic thinkers) was that of Anaxagoras (c 500 – c 428 BC). In the cosmogony of Anaxagoras, there was no place for the Gods (p105 [9]). Anaxagoras followed Anaximenes in explaining the rainbow as an interaction between light and clouds ("thickened air"), but he went into a more elaborated explanation. Starting with the idea that light propagates following straight rays, he claimed that the rainbow was produced due to the reflection of sunlight from the clouds as if they were a mirror [2]: "What we call Iris is the reflection in clouds back toward the sun" (p. 301 [10]). Picture representing the iris as a rainbow is shown in Fig 2.



Fig 2. Allegory of Air (c 1700), Antonio Palomino.

Museo Nacional del Prado, Madrid, Spain. Wikimedia Commons. https://commons.wikimedia.org/wiki/File:Antonio_Palomino_%E2%80%94_Allegory_of_air.jpg.

3 From the rainbow to the eye: iris as a part of the eye

Hirschberg pointed out [11] that the dark-eyed Greeks did not clearly differentiate between the iris and the pupil, calling both jointly “*black in the eye*” or sometimes *kóre*. This, of course, refers to the iris's external appearance. This is not surprising because systematic dissection studies of the eye were not carried out till Hellenistic times.

Herophilus of Alexandria (c. from 330/320 to 260/250 B.C.) was the first to describe the morphology of the iris [12]. Several antiquity reports (Tertullian, Vindician, Galen, and Celsus) lead us to think that Herophilus practiced dissection (and probably vivisection) of human bodies (chapter VI [12]). Thus, it is clear that Herophilus's reports are based on his dissection observations. Herophilus probably wrote a treatise On Eyes that could have survived even to Byzantine times; Aetius of Amida quotes it (p 69 [12]).

Unfortunately, as with Presocratic philosophers, only a few indirect fragments deal with Herophilus's eye anatomy. Particularly, the part mentioning the iris is an extant fragment (T87 in [12]) mentioned by Rufus Ephesus in On the names of the parts of the human body (or briefly Onomastikon).

The perforated body [sc. of the eye] is smooth on the outside where it meets with horn-like [κερατοειδει - keratoide], but rough on the side that is turned away, as Herophilus says, resembling a skin of a grape, being interwoven with blood vessels. This coat is called the ‘second’ on account of its position, ‘perforated’ on the basis of its structure, ‘grape-like’ [ράγοειής - ragoieidos] on the basis of the resemble, and ‘chorioid’ [χοριειής] on the ground that is interlaced with blood-vessels like the foetal membrane.

Herophilus used the word [ειής – eidos] or [ειδει – eidei] “appearance/s” to coin three new words in eye anatomy: keratoide –from where it is derived “cornea” through Latin cornu “horn”– , chorioid –from where it is derived “chorioid”, the word χοριον meaning “skin”– and [ράγοειής - ragoieidos] – composed of rago “grape” or “berry” and eidos –. Additionally, he also coined [άραχοειής] “retina” [12]. Herophilus assimilated the iris with the choroid (in present-time ophthalmic definitions) in a single part, what nowadays we recognize as the uveal layer in its entirety.

Considering Herophilus' skills in creating new eye anatomy nomenclature, one may believe that Herophilus also coined the word iris but Rufus forgot to mention it in the Onomastikon. However, I do not consider it a plausible hypothesis because of the following arguments: 1) Herophilus already used several terms for the iris-choroid coat: denoting location (second), morphological (ράγοειής) and physiological (χοριειής) properties. There is no apparent reason to believe that another word (iris) would have not been mentioned in this detailed enumeration. 2) Galenic and post-galenic writers already differentiated the iris (still not what we consider iris) from the choroid; for the latter, they used the term χοριειής, and for the former ράγοειής [13]. So, they assimilated one of Herophilus' words for the uvea as a whole. Why would they have ignored a supposed term coined for the iris by Herophilus? Indeed, they used the term iris, but for the area of the ciliary body (p 74 [11]).

Rufus of Ephesus (fl. 1st – 2 st century CE) was an Efesian physician and polymath. Rufus drew upon Herophilus' terminology [14] in his terminology of the ocular membranes. In his Onomastikon he wrote [14]:

The iris [ἴρις] is that which extends from the pupil to the white of the eye. They say that the color of the iris is black, tawny, blueish-green, or bluish gray. The crown [στεφάνη] encircles the black and separates it from the white.

Of course, this fragment does not provide a detailed explanation of the term ἴρις, because Onomastikon is just an anatomical dictionary (indeed, the first one to appear in history) aimed at providing anatomical terminology to students. Anyway, this text, as far as is known to date, is the first use of the word

ἴριω in reference to the anatomy of the human eye. Rufus also uses the term [στεφάνη-*stephanen*], meaning “crown” which appears, for instance, in the Bible [16]. With the available texts, the most reasonable thing to assume is that it was Rufus himself who coined the term. Indeed, Rufus stands out for his anatomical terminology creativity [16].

Last, but not least, there is a remaining question: why did Rufus use this term? Galen of Pergamon (129 CE – c 210 CE) provided an interesting explanation of the possible etymology of the word [17]:

This place is called *iris* [ἴριω] by those skilled in such matters; some call it the wreath, and if you go about the dissection of the circles in the right way and make your examination without obliterating them, you will see the seven lying one upon another in this region and differing in thickness and color, so that even if you wished you could not give the place any name other than *iris*.

By “those skilled in such matters” Galen could be referring to Rufus. Many times, Galen’s writings depend on Rufus’s terminology and he usually did not explicitly quote him [16]. It should be noted that for Galen the *iris* denotes a region where the seven coats of the eye converge (see discussion at [15] and pp 467-468 [17]). As it is well known, traditionally the rainbow is composed of seven arches of different colors. Galen was a fervent believer in the structured and harmonic nature of the human body, which he viewed as a micro-cosmos analogy of the planetary cosmos [18]. Therefore, his human eye anatomy comprising “seven circles” fits very well the Greek cosmological view of the seven celestial spheres (five known planets plus the sun and the moon) and the seven arches of the rainbow. Galen’s etymological interpretation could be completely invented a posteriori, as we have seen happen with Plato’s false etymology.

Anyway, it is very reasonable that, at least, the bent nature of the rainbow (*iris*) was again the metaphorical inspiration for coining the word for this bent structure inside the human eye, as for the term crown [στεφάνη]. If this hypothesis is correct, once again the metaphor appears as a source of a new meaning for the word *iris*. This would be no surprise because the origins of scientific cognition are bounded to metaphorical thinking, as shown above with other eye anatomy terminology.

4 Conclusions

I have revisited the etymology of the word *iris* from the ancient Greek [ἴριω – *Iris*]. The first meaning of the word was the Homeric God embodying the rainbow. Later the meaning turned into meteorological phenomena and finally took the meaning in eye anatomy. Both meaning transitions were bounded to metaphorical thinking.

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[Received: 12.01.2023; accepted: 10.02.2023]



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