



URANOS: STARS, CONSTELLATIONS AND SKY LORE

all publics – educators & pedagogues – researchers & passionate amateurs

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Celestial Sky figures & Sky lore as a springboard for astronomical knowledge

Earth and Moon as seen from Mars,
NASA/JPL-Caltech/University of Arizona



Whatever scientific aims we are seeking in observing the stars, we cannot fail to be enchanted by the spectacle of the celestial vault. We have probably there a reason why human society have been mixing into a unique knowledge their astronomical observations and their cosmogonical and cosmological conceptions.

But it means also that the contexturation of the celestial vault into constellations, just as the rich game of star lores that are offering to us the various cultures, are both concealing real means to organize and memorize an astronomical positive knowledge.

Paying attention to the celestial representations of the societies that precede the modern one, but also to those of other cultures in the world, has not only an interest on an aesthetic or anthropological point of view. It may also mean a real springboard for initiating youth, and more particularly children, not only to the history of astronomy, what allow to make this discipline less arid, but also to make understand, on a pleasant and even ludic way, the sky movements and many astronomical phenomena, and constitute so an precious educational tool.

We propose to take as an example the constellation of *Orion*. We intend to show with this celestial figure that the formation of constellations, with gathering of certain stars and separation from others, establishment of relations between

these groups and, at least, the attempt of harmonization of the whole vault, meet not only to esthetical and sometimes religious preoccupations but also the need of presenting clearly to the people the movements of the sky.

We recall, in a first Part, the mythology of *Orion* in the Greek culture by quoting major authors, and give the evidence that this figure is a Mesopotamian heritage.

In a second part, we intend to examine the representations of the correspondent to *Orion* and theirs functions in various cultures, with the following points:

1. *Orion* as a clock of the night.
2. *Orion* as the antecedent of *Sirius* in the sidereal calendars
3. *Orion* as a guide marks for travelers and sailors.

First part: On the constellation of *Orion*

1. Mythology of *Orion*

We find the most ancient references to Orion in Greek literature in Homer and Hesiod.

Homer describes, in the extreme end of the 9th century BC or in the beginning of the 8th, the construction of the shield of Achilles by Hephaestus, in a cosmogonical painting:

The shield had five layers. On the outer one,
with his great skill he fashioned many rich designs.
There he hammered out the earth, the heavens, the sea,
the untiring sun, the moon at the full, along with
every constellation which crowns the heavens—
the Pleiades, the Hyades, mighty Orion,
and the Bear, which some people call the Wain,
always circling in the same position, watching Orion,
the only stars that never bathe in Ocean stream.

Iliad, Book XVIII

As for Hesiod (latter half of the 8th century BC), here are some extracts of his famous parapegma presented as a poem:

“Set your slaves to winnow Demeter’s holy grain, when strong Orion first appears, on a smooth threshing-floor in an airy place. [...]

[...] when Orion and Sirius are come into mid-heaven, and rosy-fingered Dawn sees Arcturus, then cut off all the grape-clusters, Perses, and bring them home.

[...] when the Pleiades and Hyades and strong Orion begin to set, then remember to plough in season: and so the completed year will fitly pass beneath the earth, [...]

[...] when the Pleiades plunge into the misty sea to escape Orion's rude strength, then truly gales of all kinds rage.”

Hesiod, *Works and days*, 597-620.

Here is now the legend of *Orion* told by Aratus of Soles (ca. 315 BC/310 BC – 240 BC) who set into verses the description of the celestial vault due to Eudoxus of Cnidus (410/408 BC – 355/347 BC):

“The winding River will straightway sink in fair flowing ocean at the coming of Scorpion [Scorpio], whose rising puts to flight even the mighty Orion. Thy pardon, Artemis, we crave! There is a tale told by the men of old, who said that stout Orion laid hands upon her robe, what time in Chios he was smiting with his strong club all manner of beasts, as a service of the hunt to that King Oenopion. But she forthwith rent in twain the surrounding hills of the island and roused up against him another kind of beast – even the Scorpion, who proving mightier wounded him, mighty though he was, and slew him, for that he had vexed Artemis. Wherefore, too, men say that at the rising of the Scorpion in the East Orion flees at the Western verge.”

Aratos, *Phaenomenia*, 634-647.

Eratosthenes (ca. 276- ca. 174 BC) told us a similar story:

“Orion left for Crete and was devoted to hunting in company of Artemis and of Leto and it seems that he threatened to exterminate all the animals living on Earth. Angry with him, Gea made emerge a gigantic scorpion which killed it by striking it of its dart. This is why Zeus, taking into account its courage, placed it among the constellations at the request of Artemis and Leto, and also placed the scorpion there, so that one remembers the event”.

Eratosthenes, *Katasterismoi*, “Orion”.

2. *Orion*, as a Mesopotamian Heritage

As we may read on Mesopotamian astronomical tablets dated back to the 7th-6th centuries BC, Orion’s space is occupied by a figure named SIPA.ZI.AN.NA, “True Shepherd of Anu”. According to the most famous Mesopotamian astronomical treaty, tablet *MUL.APIN* – BM 86378, etc., dated before 625 BC –, SIPA.ZI.AN.NA, “True Shepherd of Anu” is a manifestation of PAP.SUKAL, “the Messenger of Anu and Ištar”.

In the marvelous myth of the Descent of Ištar, the goddess of fertility, love, sex and war, love, it is PAP.SUKAL who advise Anu, the father of the gods, when the goddess is made prisoner in the Hell by his daughter Ereškigal, that any sexual activity has ceased on the earth, putting in danger life of plants, animals and human beings, what led Anu to find a solution for extracting Ištar from the Hell.

In the texts of the second part of the 2nd millenary BC, for example the tablet called *Astrolabe B*, 12th century BC, the rising of the star SIPA.ZI.AN.NA, “True Shepherd of Anu”, is coming after the rising of GU⁴.AN.NA, “the Celestial Bull”, i.e. *α Tauri*, and before this of the star MAŠ.TAB.BA.GAL.GAL, “the Great Twins”, i.e. *α Gemini*, and may be identified

to α *Orionis*. Then, in texts of the beginning of the 1st millenary – for example BM 787161, 7th 5th century –, when the figure has already took shape, the stars we know are the following:

“Crown of the True Shepherd of Anu” λ *Orionis*.

“Right Hand of the True Shepherd of Anu” ξ *Orionis*.

“Rear Foot of the True Shepherd of Anu” κ *Orionis*.

It is obvious that the figure of *Orion*, though very ancient in Greek culture, is Mesopotamian heritage. If the etymology of the name is obscure, his epithet “the Giant”, is a loan to Mesopotamian mythology where the akkadian name of SIPA.ZI.AN.NA, “True Shepherd of Anu”, is *Šitadāhu*, “the Giant”.

Second part: representations of *Orion* **and their functions in various cultures**

1. *Orion* as a clock of the night.

Very soon, in various cultures, was established a link between *Orion* et *Scorpius*, for the reason why the two figures have simultaneous rising and setting.

Thus, after *MUL.APIN*: “The Breast of the *Scorpion* and the *She-Goat* [= *Lyra*] rise, and the *Old Man* [= *Perseus*] and the *True Shepherd of Anu* [= *Orion*].

As for the Greek Aratos, he wrote in his *Phaenomena*: “the coming of *Scorpion*, whose rising puts to flight even the mighty *Orion*”. And this is quoted in the same way by the Latin Caius Julius Hyginus (ca. 64 BC – AD 17) in his *Astronomia*, II, 33: “he sets at the rising of rear of *Scorpion* and at that of *Sagittarius*”.

But one of the most beautiful legend on this subject is due to the Chinese, who not only use the lunar mansion three stars of *Orion*'s *Belt* as clock of the night in Winter, but also its opposite mansion, that corresponds to *Heart of Scorpius* as a clock for the Summer nights.

Here is this legend: Shichen was the younger son of an emperor named Gaoxinshi. He was always fighting with his elder brother Ebo. The situation was so desperate that his father had no choice but to separate them. Ebo was moved to Shangqiu in Henan – where we may note that was established precisely Ebo Tai, known as the first Chinese astronomical observatory – and was responsible for sacrifices to the *Xīn* mansion, while Shichen was moved to Daxia (in Farghana, nowadays in Ouzbzekistan) and was responsible for the sacrifices to *Shēn*. These two lunar mansions are just like the brothers, who lived far away from each other and never met.

2. *Orion* as the antecedent of *Sirius* in the sidereal calendars

Looking at the sky leads to observe an remarkable alignment of the asterisms of *Pleiades*, *Hyades*, *Orion's Belt*, and finally *Sirius* star. That did not fail to lead the different people to establish a mythological link between the figures linked to them. So, for the Greeks, the *Giant Orion*, who is in fight with *Taurus*, is pursuing the *Pleiades*, and is himself pursued by *Canis Major*. Often, these stars are conceived as stations in the ancient sidereal calendars, and it is particularly true for two peoples:

a. In Ancient Egypt:

Egyptians who attached a particular importance to the rising of *Sopdet* [or *Sothis* for the Greeks = *Sirius*] that announced the flood of the Nile, and could prepare themselves to this primordial date for the life of their country, as soon as the stars of *Orion's Belt* they called *Sah*, “the Man who is walking”. Therefore, there is no surprise in the fact that the couple of gods corresponding to these stars, that is to say Isis and Osiris, occupy a central place in the Egyptian mythology.

b. In India:

Two stars are belonging to the नक्षत्र *naksatrā*, “the lunar mansions”, that constitutes the antique sidereal calendar. The are:

* मृगशीर्षा *Mṛgāśīras*, “Head of the Antelope”, λ *Orionis*

* बाहू *Bāhū*, “the Two Arms [of the Antelope]”, α *Orionis*

We have the following names in this celestial region:

* इषु त्रिकाण्ड *Iṣu trikāṇḍa*, “the Tripartite Arrow”, $\zeta\epsilon\delta$ *Orionis*

It is easy to understand that the constellation of मृग *Mṛgā*, “the Antelope” is corresponding to *Orion*, what is confirmed by the fact that we find also the name of बाहु *Bāhu*, “the Arms [of the Antelope]”, for β and κ *Orionis* as well, both stars being located on the feet of the animal.

And we meet, in this celestial region मृगव्याध *Mṛgavyādha*, « The Hunter of the Antelope», or लुब्धक *Lubdhaka*, “the Hunter”, for α *Canis Majoris*. i.e. *Sirius*.

The *Mahābhārata*, one of the two major Sanskrit epics of ancient India, which former texts date back to the 8th century BC and the latter ones to the 4th century AD, shows to us a very straight link between the divine figures patronizing the constellation of *Mṛgā*, “the Antelope” and the name for α *Canis Majoris*. i.e. *Sirius*. And we may attend, with this sacred text, to a fabulous mythological scene:

Mṛgavyādha, « The Hunter of the Antelope», who represents Rudra, avatar of Śiva, is percing *Mṛgā*, “the Antelope”, who represents on his side Prajāpati, the male half of Brahma, in order to punish him for having committed, at the world aurora, the primordial incest with his daughter Usha. It is the reason why *Mṛgavyādha*, α *Canis Majoris*. Is also called लुब्धक *Lubdhaka*, literally “the Hunter of Ka”, knowing that *Ka* is an other name of Prajāpati.

3. Orion as a guide marks for travelers and sailors

For the Arabs, *Orion's* space is occupied by a very beautiful constellation named الجوزاء *Al-Jawzā'*, who is figuring a kind of hunter goddess pointing her bow to the Left forefoot of the *Superlion* located on place on $\alpha\beta$ *Gemini*, but her body

goes over the limits of *Orion* and spreads on the areas of *Gemini*, *Monoceros*, *Eridanus* and *Lepus*. So, we may list the following Arabic names:

- * رأس الجوزاء *Ra's al-Jawzā'*, “Head of Elgeuze”,
- or تاج الجوزاء *Tāj al-Jawzā'*, “Crown of Elgeuze”, $\lambda\phi^1\phi^2$ *Orionis*
- * يد الجوزاء *Yid al-Jawzā'*, “Hand of Elgeuze”,
- or منكب الجوزاء *Mankib al-Jawzā'*, “Shoulder of Elgeuze”, α *Orionis*
- (what gave *Betelgeuse* or *Mankeb*)
- * ذوائب الجوزاء *Dawā'ib al-Jawzā'*, “Hair of Elgeuze”, $\pi^1-\pi^6$ *Orionis*
- * فقار الجوزاء *Faqār al-Jawzā'*, “Backbone of Elgeuze”, $\zeta\epsilon\delta$ *Orionis*
- * قوس الجوزاء *Qaws al-Jawzā'*, “Bow of Elgeuze”, $\mu\eta+\gamma\zeta$ *Gemini*
- + $\epsilon\beta\gamma$ *Monocerotis*
- * كرسى الجوزاء المقدم *Kursī l-Jawzā' al-muqaddam*, “Throne Ant. of Elgeuze”, $\beta\tau$ *Orionis*
- + $\beta\lambda$ *Eridani*
- (which gave *Cursa Ant.* for β *Eridani* et *Cursa Ant.* for τ *Orionis*)
- * كرسى الجوزاء المؤخر *Kursī al-Jawzā' almu'ahḥar*, “Throne Post. of Elgeuze”, α *Leporis*

The name of الجوزاء *Al-Jawzā'* means probably “The One who is in the Middle [of the sky]” or “the Median” –. And the constellation which is occupying so a central place in the sky when you look at the South, constitutes the starting point for guiding the traveler, the sailor just as the Bedouin towards the South, marked, for the Arabs, by سهيل *Suhayl*, which the Arabic name for *Canopus*, i.e. α *Carinae*.

We may expect that a legend stage such this fact, and indeed, we get the legend telling the tragic love of *Suhayl* and *Al-Jawzā'* – whose name is, in Arabic, the metathesis of *al-zawja*, “the bride”.

So *Suhayl* married *Al-Jawzā'*. But while entering the layer of the beloved woman, he fell inopportunely on her and broke her backbone. Fearing to be obliged to give an account of her life and to go on staying in the middle of the sky, he flew towards the South. This exile involves a vast disturbance in the southern sky, because his two sisters, who both are called الشعرى *Al-Shi'ra'* on account of their “[brilliant] Hair”, wanted to follow him. The first one, who managed to cross the Milky Way, is named for that العبرى *Al-Shi'ra' al-^cabūr*, “Crossing Al-Shira”. As for the other, she remained on the other bank and its ravaged eyes by the tears make her call الشعرى الغميصة *Al-Shi'ra' al-Ġomayṣa*, “Rhummy-eyed Al-Shira”.

Thus, as we may observe, in addition to the pleasure that they give to us, all these pleasant legends allow us to memorize in a very simple way the relative situation of stars and constellations and the movements of the celestial vault. And we might also examine others representations by others people which are at our disposal, such as those of the Lakotas, an North American Amerindian people, the Incas in South America, the Tuaregs in Sahara, the Namaquas of Namibia, the inhabitants of Palawan, an island province of Philippines, etc.