

How the galactic center replaced the constellations

A competing paradigm for the Great Year and astrological ages

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Where in heavens have you been? —your mother

Abstract: The lack of unanimity regarding the timing of the ages in the Great Year precessional cycle has been problematic for astrology and is a perennial source of derision emanating from the scientific community, where it is sometimes incorrectly argued that Ophiuchus should be a zodiacal sign. Despite the minimal role that the precessional ages plays in the practice of astrology, this is one of the main issues today that prevents astrology from entering into modern acceptance and the potential it would otherwise offer for research. Even after many years of effort, the precessional problem in astrology cannot be educated away to the satisfaction of critics and the time is overdue for a change of paradigm. This proposal argues that zodiac meanings are derived from observations separate from the constellations and that a more modern consideration of galactic structure will resolve the issue of the astrological ages.

You are standing alone on the Earth with the infinite plane of the horizon extending around you. Half of the universe is up, and half is down. Perpendicular to the horizon is the meridian where you are. It is another plane that divides the universe in half. Where you are, at the center of the universe, up emerges from down and down emerges from up.

You watch the sunrise over the course of a year. For part of the year, the Sun ascends in a big arc high in the sky. Daylight is long and the weather is hot. For the opposite part of the year, the Sun ascends in a low arc. Then, daylight is short and the weather is cold. You stand up stones to mark the places where the Sun rises in the extremes of the year. Two great stones mark the solstices — one to watch at the longest day and one to watch at the shortest day. Because they mark where the Sun turns, you call these places the tropics. They are the ends of a hierarchy between high and low. Midway, you stand up another stone, at the place where night equals

day — the equinox, a stone to mark where low becomes high and high becomes low.

You watch the horizon among these stones. The Sun, Moon, and some of the stars seem to be buoyed by an invisible tide. They approach and recede between the shore of one stone and the other. The Sun brings its season of heat, but from that you cannot infer what other stars might bring. You watch the seasons of the stars with these stones, which are the timers of certain things. The villagers also watch with you.

It crosses your mind that there are as many centers of the universe as there are individuals. There are as many universes as there are individuals. There are as many solitudes of mind as individual things and universes.

In the foothills, you learned to be a tracker of expressions, light, heavy, hungry, tired and every emotion that crept, crouched and cried.

The Moon could not but follow every skull, including yours and slash a dashed line across the night to finally stab the humidity that walked upon your heart.

From each epicenter to some circuitous event a birth, a death, a victory, a loss, in every epic encounter that poured upon the radii of your horizon treks you would inscribe each star's gift.

In the city at the edge of the desert where you live, everyone knows everything about everyone else. People share their lives to live here. At night, as you closely track the stars, they seem to converse, as the city itself does, in the same moving proportions. Most peculiar are the wandering stars, the ones called planets. They move about in a plane that circles the city and all terrestrial-

oceanic existence. You watch the stars that wander in the nearby distance, and others that wander more distant still. You watch how each unreachable star inhabits a dimension of the city's immediate soul. And you impart your knowledge as something of what you share.

In this moving multiverse, shared by each person of the city multitude, you notice the virtues of things. Some things have the virtue of upward motion, like goats that climb desert mountains, as high up as you can see. This, you think, is the ambitious virtue. You notice other things that have a virtue of downward motion, like the crabs that seek refuge in the sea, as far down as you can dive. This, you think, is the prudent virtue.

You discover contrariness in how the universe appears to be and what you want to think. Ambition is when the wandering stars go in low trajectory. Prudence is when they go high. It's the opposite of what you might expect between physically high and low. The effect is greater in the north such that it could reverse in the south. Yet, it does not matter what you might think. It's the virtues themselves that concern you and the observation that they are timed by the stars as they wander between a hierarchy of high to low and low to high.

You see too that when wandering stars pass by the equinox, virtue there depends on what tropic was visited last. One direction is like the head-butting fights of rams of equal stature. Equality cannot sustain and one adversary wins by virtue of bravery. In the other direction, the equinox is like the weigh scales in the market. Equality is carefully created in virtue of honor. The main virtues then, are bravery, prudence, honor, and ambition. The names most befitting them are: ram, crab, scales, and goat. All life hinges on these cardinal virtues, and they are sub-divided to make 12. A dozen is a good number for ordinals. They are the means to find order in the drama of life and to mark each epoch.

In the quiet nights, you watch the Moon move in multiphase with the Sun. You see the same lots of rhythmic sky apportioned to each pair of wandering stars. Faster stars overtake the purview of slower ones. They extend and recede, and then revisit former partners. There is a natural symmetry and cadence in the slowly advancing and arcing aspects. Each complexity of circumstance adds a stitch of intricacy.

Yet beyond these wandering stars is a host of non-wandering stars that always rise at the same places. You imagine constellations and give names to those between

the tropics for the virtues where they rise. Their shapes and sizes are of no concern, because it's the individual stars within them that you want to watch. These imagined constellations are not physical but metaphysical. If you could conceivably journey the distance as far as a constellation, you would not find a physical crab or a goat.

Then, in hundreds of years that go by, you notice that the far host of stars no longer rise at the same places where once they did, as you always thought they would. At the equinox stone, the constellation Fishes now replaces the Ram. The stars of Archer now rise at the tropic of the Goat. No one has moved the stones, and they continue to work well for the Sun, Moon, and the wandering stars. But you did not figure the distant stars would shift, and the order of the world would be unhinged, slipping as if it was off kilter.

You mention the problem to your friend Hipparchus one day in the second century BCE. He too has seen that the host of stars, in the vicinity of the wandering stars, has slowly shifted. From the records of earlier observers, he figures that the shift is about one degree per hundred years. The sidereal year, he explains, is longer in duration than the year that we measure by the Sun's tropics.

With that, you feel some regret at having given the constellations the same names as the tropics. It's evident now that they really don't match. You could have given the constellations any silly names and it wouldn't have mattered. In fact, it would have been better. You suggest to Hipparchus that the constellations need to be updated. You could keep the same names, but use different stars to adjust to the shift. But, as Hipparchus points out, such a change in constellational metaphysics would need to be made again and again. The stars will continue to shift. He remarks how the idea is neither feasible nor necessary. It has always been the planets and individual stars that interest you, not the constellations.

Sometime later, in the second century, you mention the same problem to your friend Claudius Ptolemy. He says that the metaphysical sphere, upon which the distant stars are fixed, is slowly moving relative to the tropics. He disdains the idea of reconfiguring the constellations with different stars. Where he lives, entire temples have been dismantled and rebuilt to align with a fixed star. Reconfiguring constellations, he says, is just as much a folly as realigning temples.

In his suggestion, it is more prudent to measure all celestial bodies, including fixed stars, directly from the tropics. It is easy enough to do. The tropics do not move relative to fixed stars, but fixed stars move relative to the tropics. The astrological tropics, he says, are the reliable foundations that demarcate the seasons, the virtues, and the rhythms of the universe. Hence the tropics organize the goodness and quality of life.

After many more years go by, you learn the reason why the fixed stars shift. It is due to precession, a wobbling motion of the Earth's poles. The rate is about 50.3 arc seconds per year, or approximately one degree per 71.6 years. A complete 360 degree cycle might take about 25,772 years, although the period varies. Later still, you learn that the constellational shapes are falling into ruin. Each star moves on its own unique course. The stars comingle and the erstwhile constellations that you made up so long ago will be scattered like dust in the wind.

Sometimes it's difficult to tell where a cycle begins and ends. All cycles are relative to a specific point of reference, but where is this point? The 26,000 year cycle of precession makes you wonder. You now know that you cannot fix this point on a constellation, because constellations move. The positions of stars in constellations, like the wandering stars, need to be measured within a common frame of reference. Astrological measurement, as Ptolemy emphasized, should be relative to the tropics. The question then is what celestial thing in the precessional cycle moves relative to the tropics? What special star would it be, and why would any star be special?

With this thought in mind, you extend your hand to greet your new friend, astronomer Dr. Nilo. You're meeting him face-to-face for the first time, mid-afternoon, at the Sagredo Café, on New York's 10th Avenue. You both take your decaffeinated coffees and settle at a table in a quiet spot.

"This is a nice little place," you say, pulling off your coat, "but a bit far from the planetarium. You must like to walk on your break."

"I only agreed to come at the insistence of our mutual friend," Nilo answers, shifting his gaze uneasily around the café. "If someone recognizes me, I'd have to introduce you, and that would not be easy for me."

"Maybe it would be best just to tell the truth," you say

with a frown. "You're meeting an expert to make sure that you don't misrepresent astrology."

N: I don't know all the details of astrology, but I don't think I've misrepresented anything from a scientific standpoint. That is the extent of my concern. When astrology contradicts science, or misrepresents itself as science, that's where I come in, because then it has to do with science literacy.

Y: Tell me then what all astrologers want to know. Why do you suggest that Ophiuchus should be part of the zodiac as a 13th sign? You're not an astrologer and that's a misrepresentation. The constellations are not signs. The tropical signs are equal divisions of ecliptic longitude. You can't just go and arbitrarily add more signs like that.

N: Well, it's one way to illustrate the divergence of astrology from science. There are more constellations along the Sun's path than astrology acknowledges, and so there's a discrepancy. The Sun, Moon, and planets move through those constellations, and Ophiuchus happens to be one of them. It's obvious to anyone who looks at the ecliptic, but astrology fails to recognize this.

Y: So you don't agree with the tropical measurement system that astrology has used for centuries, that the zodiac signs are equal segments of longitude? You are trying to suggest that the irregular and imaginary boundaries of constellations are somehow better. It just seems to me that you and your colleagues, who are not astrologers, are deliberately trying to sabotage astrology by stretching and chopping off pieces to fit your procrustean bed. It's consistent with research shenanigans that have been well documented (Rawlins 1981). Either by ignorance or intent, so-called skeptical researchers have sabotaged their own astrological experiments. Their conclusions have passed for truth, yet they have no accountability. The objections of astrologers are simply ignored. You need to hear this. To me, this Ophiuchus argument is consistent with a pattern of misleading assertions that have the appearance of science, but in fact fall short of scientific objectivity.

N: With all due respect for the efforts of astrological researchers, the measurement system that astrology uses goes contrary to objective observation. Until that system changes, all research is unavailing. Although there was an alignment between the tropical signs and

constellations more than 2000 years ago, the signs have gone more out of synch with each passing year. The vernal equinox, which is the starting point of the tropical zodiac, moves because of the precessional motion of the Earth's poles. So, while you might believe you're a Scorpio, based on where the zodiac was historically, in fact you're really a Libra, because that's the actual constellation where the Sun was when you were born.

Y: There's a flaw in that reasoning, Dr. Nilo, and it's an important one. Astrology doesn't care about the constellations. I think this is something that you and your colleagues should already know, are you're just using this argument to cover some deficiency that you don't understand. To ignore the signs, and suggest that astrology should instead use the constellations that have the same names, is a straw man argument. Individual stars are used in the practice of astrology, but constellations are not. Individual stars move by precession through the signs, only much more slowly than the planets do. In the second century, Ptolemy established the tropical zodiac as the inertial frame of reference. Even Indian Vedic astrology and other so-called sidereal astrologies are fundamentally tropical. They are configured according to the unmoving reference frame of the tropics.

N: I don't think your argument is entirely accurate. Everyone's heard of the dawning of the Age of Aquarius. It's one of the most popular concepts in astrology, and it's based on precession. It means that the vernal equinox, having moved from Aries through the constellation Pisces, is now approaching the constellation Aquarius. As I understand it, this is a basic concept in astrology, and as such, it has drawn the attention of scientists. What makes it worse is that no one seems to even remotely know when the Aquarian Age begins. I think an astrologer has collected more than a hundred estimates, and those estimates vary by as much as hundreds of years (Campion 2004). To me, it's an admission by an astrologer that astrology is inaccurate and irresolvable as a system.

Y: To be honest, I don't know how the idea of constellational ages ever got started, or whether it's just intended to create confusion and harm to astrology. The debate on this goes back only to the nineteenth century and has nothing to do with the everyday practice of astrology. In my view it goes against the principles. Astrologers should not accept it. The underlying

problem is that the constellations are not real. Someone made them up long ago. Maybe that was a mistake.

N: Then you admit that astrology has a problem and maybe there was a mistake. You're saying that the constellations aren't real, but you don't mean that the stars aren't real? You can't argue against that.

Y: I'm not. The stars are real material things, like planets, but their formation into constellations is imaginary. Constellations are just metaphysical props to help locate the stars. I'll give you an analogy. If we think of gravity as a trampoline under a heavy weight that structures the surrounding spacetime, as it's always illustrated in general relativity theory, we're not thinking that there's an actual trampoline out there that we can see and touch. The trampoline is an imaginary metaphysical concept. It's a virtual trampoline. It gives us the mathematics of general relativity, but we should not confuse the physical with the metaphysical and virtual. Let's say you're an astronomer hundreds of years ago, and you describe the crystalline spheres upon which the planets and the stars are fixed. Do you mean for certain that there are physical spheres, just like today there are physical trampolines surrounding bodies in relativistic spacetime? We only imagine these metaphysical things, including the constellations, because they are useful concepts.¹

N: So if I understand correctly, you're arguing that the constellations are just virtual concepts and are a mistake? Then doesn't that make astrology itself, and the symbolism of its constellations, a mistake?

Y: No, I'm saying it's a mistake for astrology to use constellations, or to assume that astrologers use them in practice when they don't. The symbolism of the signs doesn't carry over to the constellations with the same names. There is no constellational basis for a sidereal zodiac as you're trying to suggest. The constellations have been used mainly for one purpose, the 26,000, whatever it is, year cycle of precession, the so-called Great Year.

N: But, you can't have it both ways. Do you hear what you're saying? You just said that the constellations are used for the cycle of precession. And you're also trying to deny it and pretend that constellations don't mean anything.

Y: I'm saying that precession relative to constellations is

untenable. It's incorrect. And it's irrelevant in everyday practice. But your implication is correct in so far as the concept is ill-conceived and extremely damaging. It has incapacitated astrology to the point of paralysis and derision in the esteem of science. There's really no good reason why astrology should accept that the signs have anything to do with the constellations that have the same names. Yet there are good reasons, like the lack of agreement on when the Age of Aquarius begins, why they should not. The problem goes back to a critical issue and that's why I need to talk to you. Astronomy doesn't describe precession correctly for astrology.

N: I don't know what you mean by that. Astronomy describes precession perfectly well. Precession is the wobble in the Earth's spin axis caused mainly by the gravitational pull on the Earth's equatorial bulge by its relatively large Moon. It's a situation that you're not likely to find often in other planetary systems. These are simply the facts and whatever astrology has to say about it is irrelevant to science.

Y: The cause of precession isn't the problem, Dr. Nilo; it's the way precession is measured. In astronomy, let's say you observe the annual shift of a distant galaxy or radio source near the ecliptic. From those observations you would arrive at the figure of 26,000 years for a complete cycle. But there could be many different ways to astronomically measure it. Astronomy doesn't seem to care about the historical epoch of precession. It's considered to be just a local Earth-Moon phenomenon with no defined starting point. But in astrology of course, epochs matter.

N: You could say there is the epoch of the Earth's poles, if you think about how precession is taught. The motion of the poles describes conical shapes in the sky. Because of precession, the star Polaris becomes aligned with the North Pole once every 26,000 years. It's the brightest star that intercepts the pole in that cycle. You might think of that as an epoch.

Y: But that doesn't work because Polaris is just a local star like the other constellational stars. There's nothing special about any local star and there needs to be a bigger view than that. What's the bigger structure? There's a much larger structure with a well-defined center, evidently a black hole, in which the Sun, the local stars, and billions of other stars, are carried along just as participants.

N: Oh, do you mean the galaxy, the Milky Way? Now I

see where you're going with this; you were leading me on. You're saying that instead of using Polaris, precession should be based on the position of the black hole in the center of the Milky Way. So the vernal equinox moves relative to the galactic center and the cycle is 26,000 years.

Y: I wasn't leading you on. I just want to know if it seems reasonable to you.

N: As impressive as it sounds, the galactic center has nothing to do with precession.

Y: Neither does Polaris, at least not in any physical sense. The Milky Way galaxy is a symmetrical structure with a center. Astrology is organized by symmetries. It puts the native in the center of the natal chart and uses physical symmetries, such as the horizon, the tropics, and synodic aspects, as frames of reference. All of the billions of stars in the galaxy, including the Sun, are physically linked in a special way to the galactic center. Because of precession, the black hole at the galactic center, like any other celestial body, moves relative to the tropical signs. As I said before, in astrology the tropical zodiac, as Ptolemy recognized, is the inertial frame of reference.

N: Symmetry and frames of reference are important but there also needs to be physical influence and there's no physical connection between the galactic center and precession. One does not move the other or have any physical influence. Then there's the question of universal invariance. On some planet orbiting a distant star, maybe there'd be no precession, and there'd be different planets.

Y: This concept might seem counterintuitive to you. The invariance is not about the planets but rather about symmetry within astrological environments, and we are here with the planets and stars that we have adapted to in this environment. The cosmological principle of "As above, so below," considers the spacetime symmetries between a microcosm (an individual) and a macrocosm (the solar-planetary environment and its macrocosms). Astrological reference frames are used to measure and evaluate the complex self-organization of nature within this environment, including the adaptation of an individual's life to that environment. These adaptations are more easily understood through physical symmetries and data science than through physical influences. This is simply Occam's razor at work. The critical

consideration of multiple concepts and theories, even counterintuitive concepts, is actually healthy science. Refusing to consider differing concepts and supporting evidence because of a rigid set of principles is unhealthy science.

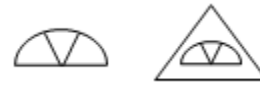
N: I doubt if there's any good evidence of astrology at all. I think I'd know about it if there was, and I haven't seen any. If someone did an experiment that supported the claims of astrology, or the psychological characterization of the planets, and it was scientifically replicated, then it would be big news. It would be reported in science journals and there'd be discussions about the extraordinary implications.

Y: You'd think that should happen but it hasn't. Some astrological theories have been tested and replicated in almost every experiment that was rigorous and fair. Even unfair experiments, where the data has been available, have been critically reassessed through open peer review and the evidence is supportive.² It's clear that a strict protocol must be enforced to objectively rate or rank the gathered data by magnitude or eminence to determine an effect. Opponents have simply ignored the scientific application of the appropriate data protocols that would be mandatory in other statistical experiments.³

N: I think you must be referring to the Gauquelin studies. I've heard that the effect sizes in these experiments are quite small. The mainstream criticism is that the effects don't apply to ordinary people and do not validate astrology as a whole.

Y: The scientific value of the Gauquelin experiments is not whether the astrological effects are small, but that they exist. They have been scientifically replicated and support the traditional meanings of the planets. This makes the evidence quite extraordinary. By comparison, the Wright brothers' first flight was very short, only a few seconds in the air, yet it proved the concept. Many beginning start small. It's good that you and I are talking about this. More people should, but we've digressed. My question today is whether the galactic center provides a better measurement of precession than the boundaries of the constellations. Let's say we represent the black hole at the center of the galaxy as Nut, the Egyptian goddess of the Milky Way. This is a very special star. We could draw the potential glyphs for Nut like this; it represents the Milky Way in the sky derived from Nut, who is typically shown arched over the earth. It also suggests an eye, perhaps the eye in the pyramid

capstone, I don't know. Symbols are weird things:



N: Nut? Is that what you call it?

Y: Because of precession, Nut has been moving through Sagittarius, the sign not the constellation, for almost 2000 years and it's now at about 27 degrees of that sign. You need a reasonably good understanding of the zodiac as described in astrology texts to fully appreciate what happens as Nut transits a sign, but please bear with me.

N: You're going to predict something? I'm listening, but I must warn you, I'll remember it.

Y: It's more like a forecast, except this is for the past and present. The Sagittarian era we are now in that is soon coming to an end has historically been a period of global exploration and rapid population spread, as well as the development of transportation, communications, publishing, and commerce. The world seems a much smaller and more intimate place than it was before. Public religion, law, and education also developed. In the 2100 year epoch of Nut before that, different values were preeminent. That was an era of monumental burials, death rituals, and other Scorpionic values. The research would be to see how patterns of historical events correlate to astrological alignments with Nut.

N: Or, maybe these patterns would just confirm the argument that astrology is good at adapting its symbolism to the cultural context of the times. The interpretations are general enough that they can be tailored to vaguely fit whatever is observed or anticipated. Because of that, there's nothing to stop astrologers from making groundless predictions that exploit peoples' emotions and fears. In the fringy news I hear that because the galactic center is aligning with the winter solstice it foretells the end of the world. Sorry, but I have to leave in a few minutes to go to another meeting.

Y: That's the sort of media hype that astrology is susceptible to—as are some things in science. When that happens, it's an opportunity for scholars to disentangle the hype and clarify the meanings (Scofield 2012). If the galactic paradigm has more explanatory power than the constellational paradigm, then it's a

progressive step. When Nut aligns with the winter solstice, sometime around the year 2228, the era in this new paradigm will not be Aquarius the constellation, but Capricorn the sign. This date might seem far away, but the transition happens slowly and has already begun.

N: And what's the forecast for that?

Y: Everyone knows that a global effort is needed to ensure sustainable energy and resources. It's necessary to control pollution, human population, and climate change. We need to save threatened habitats and species. People know that deeply established values and human habits oppose these pressing needs. The coming age of Nut in Capricorn is one of science and engineering—of efficiently doing much more with much less. Hierarchies and politics are emphasized, as is the polarization between the haves and the have-nots. People today know that these are the long term issues facing humanity. These are all Capricorn themes that don't play out in the same large scale during other eras. As one might expect, the first part of an era needs to repair the damage inherited from the outworn values of the preceding one. At the same time, hardened attitudes of dogma, elitism, heresy, hypocrisy, and ritualistic beliefs tend to shift from the old set of values to the next. This is something that science as well as astrology in the coming era should beware.

Nilo leans back and shakes your hand. "Glad to have met you," he says, flashing his famous smile. You smile back. He nods slightly as if to some inner thought. "I was going to ask if you could send me the names of some books and articles. You may as well add the sources that you think document unfairness or sabotage. Maybe I can have a look."

You assent. He heads east down the street and disappears into the crowd. You want to head east too, to walk in the park. You start slowly. It's been a mild winter and spring is around the corner. There's a sudden gust of wind and a sprinkling of sleet. It makes people laugh. The Sun comes out.

Notes

1. Similarly, the term "influence" has been used in a virtual sense for the descriptions of astrological effects on personality and events. Virtual influence is no more strange or unlikely a concept than the crystalline spheres of ancient astronomy, the heavy weight on a trampoline

of relativistic gravity, and similar virtual concepts in science. It should not deter the evaluation of astrology for statistical effects.

2. An example is the 1985 Shawn Carlson experiment "A double-blind test of astrology" published in the mainstream science journal *Nature*. Carlson, an undergraduate student at the time of the experiment, was an accomplished magician and the article is a fascinating example of the art of audience misdirection worthy of study in itself. Flaws found in the experiment include failure to disclose the literature of similar scientific experiments (which were positive and possibly the reason for this experiment), failure to minimize sampling biases (despite documented protests), failure to segregate sample classes from non-related tests (which skewed results), failure to apply its own criteria of success evaluation(!), and failure to evaluate unexpected results (which were discarded) that might have clarified the mystery of a significant and suspicious "statistical fluctuation." When the published data of the Carlson experiment is evaluated according to the stated success criteria and the probability norms of social science, the two tests performed by the participating astrologers provide statistically significant evidence that is consistent with astrology. (Vidmar 2008, Ertel 2009, McRitchie 2011, Currey 2011).

3. An example is represented by the 1996 book *The "Mars Effect": A French Test of Over 1000 Sports Champions*, published for the French Committee for the Study of Paranormal Phenomena (CFEPP) by Benski et al with commentary by J.W. Nienhuys. This experiment failed to apply objective data ranking protocols that were used to minimize data selection bias in previous Mars effect experiments. No reasons were offered for the failure to do so. Data scientist Michel Gauquelin, initial author of the Mars findings, had formally protested this issue (Ertel 1996b). Due of the overwhelming weight of its many co-authors, the subsequent publication of the CFEPP experiment, without the objectifying protocols, effectually destroyed Gauquelin's reputation. When the objectifying protocols were applied to the CFEPP data in independent assessments by Suitbert Ertel and Kenneth Irving (1994, 1996a, 1996b), the results supported previous findings that the Mars effect for sports champions is functionally correlated to professional eminence. Although Nienhuys in the book appears to dispute Ertel's findings, his complaints are over trivial clerical errors that do not affect the finding of statistically significant

eminence effects in the CFEP data (Ertel 1996c).

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