POSITION OF THE ANCIENT STAR-ZODIAC

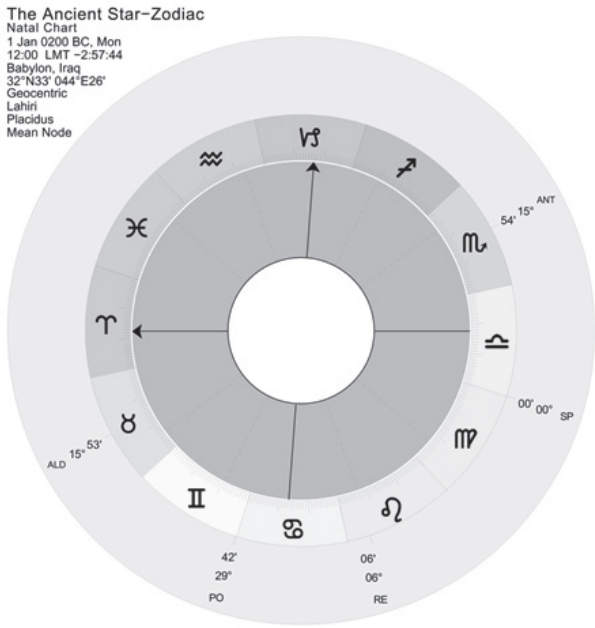
Nicholas Kollerstrom

The ancient Babylonians recorded celestial longitudes, of stars and then of planets, with no hint that they needed to tell anyone what was their celestial reference: their zodiac had no arrow marked, "start here." Centuries later, in the Hellenistic world, we hear philosophers averring that the Babylonians had taken the Antares-Aldebaran axis as bisecting the thirty-degree signs of the Bull and the Scorpion. It is remarkable that two bright, first-magnitude stars both reddish in color should have been exactly opposite each other, within an arcminute, and it would have been reasonable for them to have taken that as their prime reference—but, we don't have any ancient Babylonian text saying that.

It's as if the ancient Babylonian stargazers on their ziggurats just "saw" the longitudes and somehow did not need to explain them.

If a single star-zodiac was used in antiquity, we should then see a consistent and simple relation between it and the modern sidereal zodiac used for investigating it. For this investigation we will mainly use the "Lahiri" star-zodiac (i.e., the Indian version of the sidereal zodiac) as given by the Solar Fire program. Thus our reference-zodiac is positioned with reference to the fixed star Spica.

In a couple of earlier articles, horoscopes of antiquity were analyzed by the author to try and ascertain what celestial reference system they had used.[1] A tropical-zodiac reference was used for this, and



Stellar longitudes (200 BC) using Lahiri zodiac, of ANT–Anteres, ALD–Aldebaran, SP–Spica, RE–Regulus and PO Pollux.

that involved using the concept of an *ayanasmsa*—i.e., phase-difference between the tropical reference and whatever sidereal zodiac might have been in use in antiquity. Such an *ayanamsa* will vary with time because one of these systems is precessing and the other is not. However the whole analysis would be in many ways simpler if one just used a sidereal reference system, and forget entirely about the tropical reference.

A century of academic work has been done on this question, always using the tropical zodiac and laboriously converting from one reference-system to another.[2] We here turn a bright new page and

1 Kollerstrom, "The Star-Zodiac of Antiquity," *Culture and Cosmos* (vol.1 no.2, winter/autumn 1997) and Linguaccio Astrale (spring 1999); Kollerstrom, "On the Measurement of Celestial longitude in Antiquity," *Optics and Astronomy, Proc. 20th Int. Cong. Hist. Sci.*, Liege, 2001, pp.145–160.

2 Recently, see Steele and Gray, "A Study of Babylonian Observations involving the Zodiac," *Journal for History of Astronomy*, 2007, 38, pp.

use only a sidereal reference. This should give us some much simpler answers than have been obtained hitherto.

We let the computer do the hard work: it computes the "proper motion" of stars, whereby their longitude changes very slowly with time, and takes account of the slow change in rotation rate of the Earth whereby times in the ancient world may be compared to ours, and will measure longitudes from wherever we tell it to.

The figure opposite shows the Solar Fire computation of key stellar longitudes for 200 BC, using that zodiac. Spica here appears as by definition at the 0°00' boundary between the Balance and the Virgin. Other stellar longitudes here given are:

Aldebaran 15°53' of the Bull;
Antares 15°54' the Scorpion
Regulus 6°6' of the Lion
and Pollux 29°42' of the Twins

It is a recent thing, that an astrology program puts the stars into a chart, or gives one the option to do so, and I hope readers agree that this helps one to picture what is going on more clearly.

Searching for a "Prime Reference"

Different suggestions have been made over the years concerning a stellar "prime reference" (if indeed there was one) for the ancient star-zodiac, e.g., John Britton and Christopher Walker wrote that the star β–Gemini (Pollux) defined zero degrees of Cancer.[3] That definition, we see from this star-zodiac diagram, differs by 18 arcminutes from that whereby Spica is the boundary of the Balance and the Virgin, a difference which may turn out to be insignificant.

Or, if Aldebaran were to define 15° of the Bull, as Cyril Fagan originally proposed, more recently endorsed by Robert Powell,[4] then Pollux would be 28°49'. (In the Solar Fire program, choose "Fagan-Allen" for this zodiac). There is a 54 or so arcminute difference here. These are the main options that have historically been advocated. There is almost one degree at stake here between the different options. Or, maybe all of these marker-stars were "prime fiducial" references, depending upon which part of the zodiac was visible in the sky.

The earliest Babylonian experience of zodiac measure comes from a tablet surmised to be around 400 BC, with stellar longitudes written as "1–30°." That is our first evidence of the human race dividing a circle into 360°—although, the Babylonians may not have seen it that way.

In 1952 Abraham Sachs published a list of these,[5] from a fragment of pre-Seleucid era star-catalogue (NB, that term "Seleucid" alludes to the first three centuries BC). As shown below, the star Spica was given as 28 degrees of the Virgin. Peter Huber in 1958 ascertained some more,[6] from his analysis of almanacs between -122 and -110—i.e., about three centuries later. He confirmed three of the longitudes found by Sachs and disagreed with none. Thereby we have a list of fourteen ancient Babylonian stellar longitudes. For comparison, sidereal longitudes given by Powell for 100 BC (Aldebaran=15°) are given.

Abe Sachs, 1952		**Aldeb.=15°**
θ Leonis	20°Leo Theta Leonis Chertan/ Chort	18° LEO 38'
β Virginis	1°Virgo Zavijava	1°VIR 56'
γ Virginis	16°Virgo Porrima	15° VIR 39'
α Virginis	28°Virgo Spica	29° VIR 07'
α Librae	20°Libra Zubenelgenubi	20° LIB 20'
β Librae	25°Libra Zubeneschamali	24° LIB 38'

These half a dozen stellar longitudes fluctuate around the Antares-Aldebaran 15° axis (their mean deviation is a mere 3'±51'), so that it does look like a feasible reference-framework. Could this have been the earliest zodiac? (We use the term here as meaning a twelvefold equal-interval division of the

443–458. The central question as to where the Zodiac they were investigating was positioned, was unanswered, and merely swathed in obscurity by translating all their data into tropical longitudes.

3 John Britton and Christopher Walker, "Astronomy and Astrology in Mesopotamia," in *Astronomy before the Telescope,* Walker (ed.), 1996, p.49.

4 Powell and Treadgold, *The Sidereal Zodia*; Powell, *History of the Zodiac.*

5 Abraham Sachs, "A Late Babylonian Star-Catalogue," *Journal of Cuneiform Studies*, 1952,6, 146–50.

6 Peter Huber, "Uber den Nullpunkt der Babylonichen Ekliptik," *Centaurus,* 1958, pp.192–208.

ecliptic—although its root-meaning is more general, as something like, "circle of animals.")

Huber, 1958		
η Tauri	3° Taurus Alcyone	5° TAU 14'
ζ Tauri	0° Gemini Zeta Tauri, Alhecka	0° TAU 01'
α Gemini	25° Gemini, Castor	25° GEM 34'
β Gemini	0° Cancer, Pollux	28° GEM 45'
ε Leonis	25° Cancer Epsilon Leonis Ras Elased	25° LEO 56'
α Leonis	5° Leo Regulus	5° LEO 12'
θ Ophuichi	27° Scorpius Theta Ophuichi	26° SCO 38'
δ Capricorni	0° Aquarius Deneb	28° CAP 35'

(A letter kindly sent by John Britten Oct. 10, 1997, gave this list of "normal stars" with longitudes "directly from Babylonian sources…of which at least eleven seem secure and the rest more probable than not.")

Again this group of star-longitudes fluctuates closely around the same star-axis (their mean deviation being -6' to 68').

Huber has here given zero degrees longitude for three stars. There was no zero then so the meaning here is not at once evident. Planetary ingresses were being recorded—i.e., dates when planets entered a new zodiac sign—as, too, were star-conjunctions. Thus their star-almanacs recorded various planetary conjunctions with β-Gemini (Pollux) *on the same date* as it reached the zodiac sign Cancer. That is why experts have tended to put Pollux at 30° Gemini (=0° Cancer). That's what Huber meant.

John Britton expressed the view that "Had Spica been placed at the very end (i.e., 29° or 30°) of Virgo, β-Gemini [Pollux] would have fallen into the sign Cancer, ς Taurus [zeta Tauri, Alhecka] into Gemini, and δ Capricorni [Deneb] into Aquarius."[7] Three possible "boundary stars" above-quoted are here alluded to. Let's give two different reference-frameworks for these three stars, which may (or may not) help to clarify this:

	Aldeb. = 15°	Spica - Lahiri
β-Gemini [Pollux]	28° 48'	29° 41'
ς Taurus [zeta Tauri, Alhecka]	00°02'	00° 55'
δ Capricorni [Deneb]	28° 41'	29° 34'

More recently the same view has been expressed (in a vague sort of way) by Steele and Gray, that the Babylonian zodiac was defined "either directly in the case of Gemini, Cancer and Aquarius, whose beginnings coincide with zeta Tauri, β-Geminorum and δ Capricorn respectively, or indirectly through the other signs."[8]

Hellenistic Greek sources have given Aldeban (α-Taurus) as 15° Taurus and Antares (α-Scorpio) as 15° Scorpio. Historian Otto Neugebauer cited Cleomedes as stating around AD 370 that the two bright stars Aldebaran and Antares were "both located at 15 of their respective sign;"[9] he also cited a similar comment as appearing in a Greek treatise by Anonymous of the year 379. These are reconstructions from a time centuries after the Babylonian civilization that had somehow "seen" the zodiac longitudes in the heavens.[10] Others have taken the view that Cleomedes lived earlier, maybe in the first century. No one before them ever says this, no Babylonian tablets list their longitude.

These two first-magnitude stars, both close to the ecliptic and both pale-pink in color, so exactly opposite—remaining within an arcminute of opposition to each other during the historical period we are looking at—stand as obvious candidates for primary reference, stars, but in that case, why have no Babylonian tablets yet discovered ever mentioned them? This fact has greatly impeded experts from accepting that they functioned as such a reference.

Seven Babylonian Horoscopes

There remain seven horoscopes from ancient Babylon that give degree longitudes to planets.

7 Britton, personal communication, Dec. 11, 1996.

8 Ref (3), 2007, p. 444.

9 Neugebauer and van Hoesen. *Greek Horoscopes*.

10 For discussion, see Powell, *History of the Zodiac*, p.101–105. Powell also claims (p.102) that Hephaeston of Thebes had given the longitude of Aldebaran as 15 Taurus, citing Neugebauer and Van hosen, *Greek Horoscopes*, p.187, but I couldn't see it there.

Babylonian horoscope Sidereal longitudes							Differences (Historic–Lahiri)				
		SU	SA	JU	MA	VE	SU	SA	JU	MA	VE
-262	Apr. 4	13:30					-3.5				
-248	Dec. 29	9:30	-	-	-	-	-3.0				
-234	Jun. 3	12	6	18	24	4	-1.8	4.1	-3.3	-2.9	4.3
-199	Jun. 4		10	26	10	5		1.5	-3.4	1.3	0.6
-198	Oct. 31		3	10	10	4		-1.4	3.7	1.9	6.4
-87	Jan. 5			27	20	1			-2.4	-1.1	-1.5
-68	Apr. 15	30	15	24	14	13	2.0	-0.6	0.8	2.7	-0.3

Compiled by Francesca Rochberg in her *Babylonian Horoscopes* of 1998, those ancient charts display the miracle, of newly manifesting zodiac longitudes. Times of day are sometimes given, and here lunar longitudes have been used to fine-tune the time of day, and so are not here cited. Mercury is excluded, as generally subject to greater errors than the other planets. No one knows how these longitudes were found, so we compare them here with respect to the simplest possible celestial reference, namely that of the star Spica at the boundary of Libra/Virgo.

No one is in a hurry to conclude that Spica actually defined the zodiac, as pertaining to the Libra/Virgo boundary, on account of the above alluded-to tablet which cited its longitude as 28° of the Virgin.

The culture of ancient Babylon was not interested in ascertaining where the "Vernal point" was: that would have been an abstraction having little or no meaning for their astronomy, which was mainly experiential—however they could and did ascertain solar zodiac longitude in their charts, even though it could not be "seen."

We here follow the example of Professor Rochberg and quite a few other people in misusing the word *horoscope*—the *Horoscopos,* or hour, of rising (i.e., the ascendant) did not appear in Egyptian–Greek horoscopes until years AD.

The earliest of these is the first known natal chart to give zodiac degrees, while the latest at 68 BC is the last known horoscope to be written in the ancient cuneiform script. How strange, that the very earliest charts should give the Sun's position to degrees and minutes—but not the later ones!

The zodiac thus emerges, and science historians and astrologers have been wondering ever since how it was defined. Readers may not need reminding that no-one in the Babylonian culture is on record as dividing a circle into 360° or indeed as measuring an angle more than thirty degrees, which happens only later on with the Greek astronomer Hipparchus on the island of Rhodes in the second century BC.

In the previous table, subtraction gives the (Historical–Lahiri) differences, in degrees of longitude. They seem to be *fluctuating around the Spica-reference zodiac* (11'±166'). They derive from the charts assembled by Francesca Rochberg,[11] most of which give no degrees but only signs. For the -198 chart, Sun and Moon positions are only given as signs but degrees are given for planets, and this suffices to lock the chart into only one possible time/space coordinate. These twenty-three celestial longitudes span two centuries.

The range given is from 1°to 30°, as *there is no zero*. So would their one degree be what we would call 0° to 0°59' and should our best estimate therefore be ½°? I haven't done that, because a few values are expressed in degrees and arcminutes. To rephrase this dilemma, if some of their degree longitudes have arcminutes, then they should not be quoting any at 30°, should they? This could burden our work with a half- degree error.

Rochberg has drawn—like most academics investigating this subject—no conclusion as to the star-zodiac's reference. In a footnote she quotes the late John Britton (p. 19) for a "correction factor" based on Peter Huber's determination in 1958 (!)

11 Rochberg, *Babylonian Horoscopes*, pp. 21–22.

		Horoscope Longitudes						Deviation from Spica zodiac					
		SU	MO	SA	JU	MA	VE	SU	MO	SA	JU	MA	VE
40	Apr. 5	19	15	20	6	15	5h	2.0	0.6	-0.1	3.7	3.6	2.8
46	Jan. 3	11:30	11	30	19	14:30	19	-4.2	0.6	4.8	-7.1	7.4	2.9
75	Jul. 19	29:30	12	27	8	7:23	28:18	2.6	-1.3	6.4	0	-5.0	3.8
76	Jan. 24	8	1	5	1	22	12	2.5	5.7	2.1	0.6	-0.1	-4.8
81	Mar. 31	14:6	13:0	5:59	6	16:3	16:4	2.1	-0.6	2.2	2.8	0.2	5.7
110	Mar. 15	25:8	16:53	1:25	25:18	21	8	-0.8	-0.2	4.3	1.4	5.6	-2.6
137	Dec. 4	13:23	3:6	3:38	12:44	30	9:54	-0.5	-0.6	4.3	0.4	4.2	-3.7
218	Nov. 27	7:55	6:51	11:3*	(Me 25 Sco)			1.3		-2.7	0.1		
260	Sep. 29	8	8:32	11:32	3		8:16	0.4	1.5	1.3	0.1	-0.1	0.4
338	Dec. 24			9:1	22	14:16	29			-0.2	1.1	-0.1	0.7

of 4°28' as the "ayanamsa" for -100[12] (i.e., she has presupposed Huber's conclusion). That was based mainly upon the above list of fixed-star positions and planetary ingresses. It was reached well before what is called "Δt" had been ascertained. Caused by a slowing down of Earth's rotation, it is a shift in time by around six hours in our re-computation of the ancient planetary positions and could have interfered with Huber's calculations.

That is one reason why we favor use of a modern program like *Solar Fire,* which will automatically make such an adjustment, so one no longer has to bother about it. As to why Rochberg does not seem able to focus on this matter, the simple answer would be that no sidereal-zodiac program is available to her, assuming that as an academic she does not want to use an astrology program.

Diaries and Alamancs

Ancient Babylonian tablets record the dates of planetary "ingresses"—i.e., when they entered a new zodiac sign, from about 200 BC onward. A thorough analysis of hundreds of these has been published by Steele and Gray, who alas only expressed their conclusions in terms of the tropical zodiac. The best we can do here, is to express their conclusions in terms of the best-fit "ayanamsa" they found, at 100 BC:[13]

Ayanamsa Estimates for 100 BC

Empirical:	Astronomical diaries	4°41'
	Almanacs	4°21'
Theoretical:	Spica zodiac	5°21'
	Aldebaran=15°	4°26'

As regards the last two terms: if one takes a chart for 100 BC, then switching between a tropical zodiac reference and that of the Lahiri (Indian-Spica) zodiac, the planetary positions then shift by about 5°21'—that was then the difference or "ayanamsa" between the two zodiacs. Ditto for a star-zodiac having Aldebaran at 15°, one would see all the longitudes shift by 4°26', from the tropical zodiac reference. No-one was then using the latter, indeed it would be centuries before anyone's solar theory was good enough to use it, but we are here applying it retrospectively as it were. Again, this does look very much as if the Antares-Aldebaran star-axis reference was here being used.

Egyptian Horoscopes

Continuing to check out planetary longitudes, we turn next to Otto Neugebauer's classic text *Greek Horoscopes.*[14] The early "horoscopes" from Babylon were written in cuneiform etched onto clay tablets, then later Egyptian horoscopes were written in Greek on Papyrus, starting 40 AD. These have a *Horoscopus*—i.e., an Ascendant,

12 Huber, op. cit.

13 Steele and Grey ref (3), pp.448–449.

14 Neugebauer and van Hoesen, *Greek Horoscopes.* Actually, they were not Greek. I feel the word was just put in the title to help sell the book. They were Egyptian mainly around Alexandria, but Greek was the written language.

		SU	MO	SA	JU	MA					
AD 508	Feb. 1	13°11'	26°4'	14°19'	3°2'	7°9'		+1.7°	-3.1°	-0.2°	+2.0°	+ 0.3°

and these charts we might expect to be more accurate. Mercury is generally excluded because it is too unreliable; its errors tend to be much greater than other planets. The Moon's position is generally used for fine-tuning the time of day so it can't really be included either: unless the chart has a *Horoscopus* which gives the time of day.

Ten of the earliest Egyptian horoscopes that gave planetary degree longitudes plus an Asc/MC position have here been listed (mainly from Neugebauer's *Greek Horoscopes*): giving their longitude degrees for all planets except Mercury, then differences in degrees after subtracting from them the modern-computed Lahiri longitude.

The zodiac used here (see opposite) is some forty-seven arcminutes away from the Spica-reference zodiac, on average. Bearing in mind here that (see figure on page 110) the Antares-Aldebaran is fifty-three arcminutes from this reference, it is considerably nearer to that star-axis measure than were the original Babylonian longitudes.

Alexander Jones has described a few ancient horoscopes unknown to Neugebauer.[15] That from the year 508 (p. 281) cites eight longitudes to both degrees and minutes, including the *Horoscopus*—i.e., the degree of the zodiac rising. For five of these we give longitudes in degrees and minutes, and measure the deviations just as previously (see above)—indicating that this is a sidereal chart (which Jones did not state). However, the latest horoscope given in *Greek Horoscopes*, that of AD 516, is clearly tropical. Thus, we have a shockingly clear delineation, of the last star-zodiac chart and the first tropical zodiac chart.

We thereby conclude that *the same star-zodiac was in use for eight centuries*, from the charts we have examined. It may well have been in use for two centuries earlier, where we maybe only have the less accurate star-longitudes—i.e., for a thousand years.

If we look at the scatter of the longitudes around the Lahiri zodiac for this 508 chart, on average they deviate by 8 to 106 arcminutes. Going back to the very first horoscope to give a set of longitude values, for the year -234 (see above) this has a scatter on average 5-200 arcminutes from that same reference! Between different cultures, over centuries, the exact *same* zodiac reference has endured. And there is not a single academic in the world who is, apparently, interested in the fact.[16] Earlier in the twentieth century, Otto Neugebauer was sufficiently distinguished that he could publish "astrological" material and have his reputation survive, but I guess that does not apply to academics today.

A Spica-defined star-zodiac would have synchronized with the tropical zodiac around 290 AD, so by the time of the above two charts they would have moved three degrees apart, and could be readily distinguished. Around the time of Ptolemy the two were more or less together so no-one could tell which one was being used, no doubt convenient for Ptolemy writing his immortal opus: which gained its "divine" power partly by having it both ways, defining his zodiac both as seasonal—i.e., tropical and star-based, or sidereal. For an Antares-Aldebaran star-zodiac that synchronizing event happened rather earlier, around AD 220.

Egypt did not have base-sixty mathematics as did Babylon, nor did it have any measure of angles (only of gradient), at which many have been surprised. The researches of Alexander Jones have brought out how in the early centuries AD the techniques of Babylonian mathematics spread around the Mediterranean, being generally superior to those of Greek math, which greatly helps us to appreciate how the Babylonian zodiac continued to be used around the Mediterranean, even after Ptolemy in his *Tetrabiblos* (c. 140 AD) had effectively defined a tropical zodiac reference.

15 Jones, *Astronomical Papyri from Oxyrhyncus,* 1999.

16 This author made the claim in 1997 at the Liege History of Science Conference (published in 2001: ref.1); since then, Robert Powell, and probably no one else, has taken an interest in it.

The Incarnation

The charts give readings of astral fate. The very earliest above-cited from -262 (263 BC) reads: "He will be lacking property.... His food will not suffice for his hunger.... His days will be long.... His wife, whom people will seduce in his presence, will" (Rochberg, p.69). Flattery was no aim of this early soothsayer!

Strictly, Francesca Rochberg's title, *Babylonian Horoscopes,* was mistaken, because these charts have no ascendant or MC, they are only for moments in time and apply universally to all the Earth. One may think of these Babylonian charts as applying to the centre of the Earth. The first horoscope proper was in 4 BC, i.e., it had an ascendant. This was the first horoscope for a real person, in that it defined a unique time/space coordinate for a birth. The *cross* of an ascendant/MC first appears in a map of personal destiny. Babylonian charts may have been for an aristocratic elite (Rochberg, p.6); to them belonged the destiny written in the stars, and ordinary folk only came to acquire that after the Incarnation.

Rudolf Steiner used to talk about the Incarnation in terms of the coming or development of a personal self-awareness...

> At the turning point of Time
> Entered the World-Spirit Light
> Into the stream of Earthly Being.
> Light that warms the hearts of simple
> shepherds.
> Light that enlightens the wise heads of kings

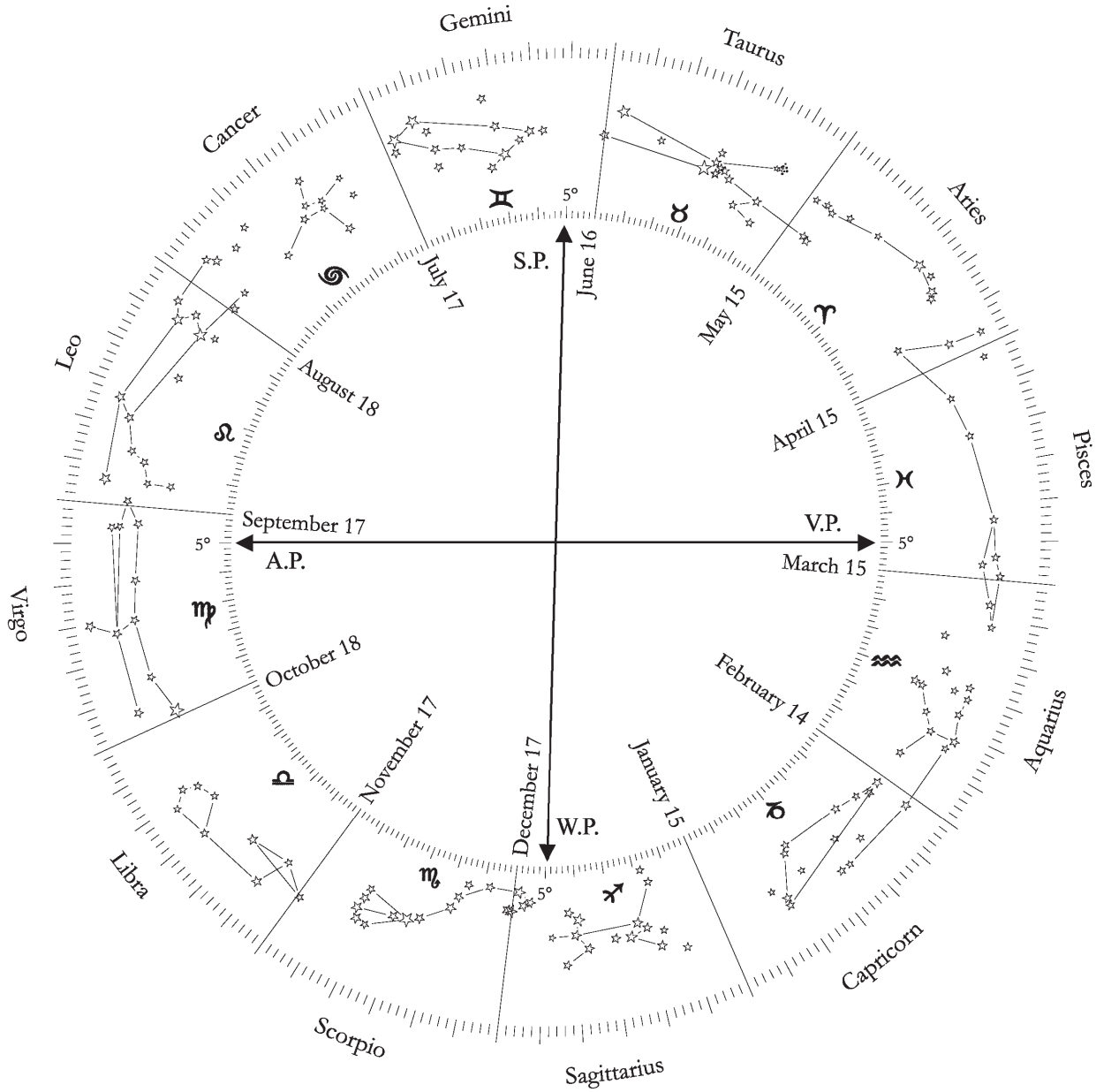
...and would describe it in terms of the dawning "I am" principle of "I"-consciousness: "I am, the Light of the World."

To check this claim, we need to look at ancient psychology, which was astrology. Here we see how horoscopes do exactly synchronize with that Event. At that moment, astrology moved west, from Babylon to Alexandria, and started to be written in Greek on papyrus. Like it or not, the whole birth of astrology is centered in time around this Event.

A Note from the Editor of the *Journal For Star Wisdom*:

It is with great appreciation that Nicholas Kollerstrom's valuable research article is presented here, an article that seeks to pinpoint the original scientific definition of the Babylonian sidereal zodiac, which was subsequently transmitted to India and continues to be used in astronomy and astrology there to the present day—although knowledge of exactly how the original Babylonian zodiac was scientifically defined in relation to the stars is no longer extant in India. As some readers will know, the theme addressed in Nicholas Kollerstrom's article is the same one that forms the essence of my PhD thesis that was published in book form as *History of the Zodiac* in 2007. Related to this theme: In my article "Zodiacal Ages and Cultural Epochs" published in the previous issue of the *Journal for Star Wisdom* (2015), some indications are given which, I believe, offer support for the conclusion reached in *History of the Zodiac* that the **prime reference** for the original scientific definition of the zodiac in relation to the fixed stars was the Aldebaran (Bull's Eye)—Antares (Scorpion's Heart) axis from the middle of the sign/constellation of Taurus (Aldebaran at 15° Taurus) to the middle of the sign/constellation of Scorpio (Antares at 15° Scorpio). Without going into the extensive material presented in the article "Zodiacal Ages and Cultural Epochs," it suffices to point out that, as indicated in the article, the dates for the cultural epochs found by Rudolf Steiner agree *exactly* with the dates of the zodiacal ages arising from studying the precession of the equinoxes through the signs/constellations of the Babylonian zodiac. This *exact concordance* over a period of some 2,400 years between the ancient Babylonian astronomers who first scientifically defined the zodiac around 500 BC and Rudolf Steiner who shortly after AD 1900 was occupied with precisely dating the cultural epochs, offers definite confirmation of the original Babylonian zodiac as having the Aldebaran (15° Taurus)—Antares (15° Scorpio) axis as the **prime reference** in their scientific definition of the zodiac. As astronomer

The sidereal zodiac
Dates of the Sun´s ingresses into the twelve signs of the zodiac



Joachim Schultz, who was a keen observer of the starry heavens, pointed out:

> It is a remarkable fact that the twelve [zodiacal] constellations show on the whole a strikingly symmetrical distribution. The approximate centers of the constellational figures are distributed at roughly equal distances from one another, about thirty degrees apart. Proceeding from Aldebaran, the primary star in the Bull, in taking equal [30°] steps around, there arises a twelvefold division which falls centrally everywhere in [each of the twelve zodiacal] constellations. In terms of [calendar] dates, at the present time the Sun is located at these positions [the central positions, i.e., 15° of the twelve zodiacal constellations] always around the beginning of each [calendar] month.... Rudolf Steiner gave the valuable indication that the seeking out [looking up to] the central

> positions of the zodiacal constellations—to the "light centers" of the individual constellations—is significant and can lead to consideration of the arrangement of the zodiacal constellations divided regularly according to the twelve primary divisions of space.[17]

Thus, from the standpoint of observational astronomy—in this case represented by the astronomer Joachim Schultz—the zodiacal constellations appear to be thirty degrees long, as they did also to the Babylonians, who defined them accordingly as the twelve 30° zodiacal signs with the same names as the twelve constellations, since the signs are embedded in their respective zodiacal constellations. In other words, for the Babylonians from around 500 BC onward, there was essentially no difference between the signs and the constellations of the zodiac. However, for their definition of the signs of the zodiac, the Babylonians had to have a prime reference as their starting point in defining the twelve 30° signs (defining each sign by way of the degree positions of the main stars in that sign), and evidently they chose Aldebaran, appearing in the middle of the constellation of Taurus, as their prime reference—Aldebaran being thus located at 15° Taurus. Similarly, they found that Antares, located exactly opposite Aldebaran in the zodiac, was located at 15° Scorpio. The natural position of Aldebaran, the Bull's Eye, at the exact center of the sign of Taurus, is confirmed observationally by Joachim Schultz, who in the above description of the division of the zodiacal constellations into twelve equal divisions takes Aldebaran as the natural point of departure.

Lastly, taking a look at the Babylonian sidereal zodiac in relation to our modern calendar dates, we see from the figure *The sidereal zodiac: Dates of the Sun's ingresses into the twelve signs of the zodiac* that, on average, each year the Sun is at 15° in the middle of each sign on these dates: 15° Sagittarius on January 1; 15° Capricorn on January 31; 15° Aquarius on March 1; 15° Pisces on March 30; 15° Aries on April 30; 15° Taurus on May 31; 15° Gemini on July 1; 15° Cancer on August 1; 15° Leo on September 1; 15° Virgo on October 3; 15° Libra on November 1; 15° Scorpio on December 2—note that according to the occurrence of leap years, and considering also other astronomical factors (including the time zone of the place where one lives), these dates can change by one day or so from year to year. Nevertheless, we see that the statement made by Joachim Schultz: "In terms of [calendar] dates, at the present time the Sun is located at these positions [the central positions, i.e., 15° of the twelve zodiacal constellations] always around the beginning of each [calendar] month" is more or less valid.

17 Schultz, *Rhythmen der Sterne*, p. 44 (tr. RP, also notes in brackets [ ] added by RP). This excellent book by Joachim Schultz has been published in English: *Movement and Rhythms of the Stars: A Guide to Naked-Eye Observation of Sun, Moon, and Planets* (Edinburgh: Floris, 1986). [Note from RP: I have not had an opportunity to compare my translation (above) with the one given in the English edition of Joachim Schultz's book.]

"It became clearer and clearer to me—as the outcome of many years of research—that in our epoch there is really something like a resurrection of the Astrology of the third epoch [the Egyptian–Babylonian period], but permeated now with the Christ Impulse. Today, we must search among the stars in a way different from the old ways. The stellar script must once more become something that speaks to us."

—Rudolf Steiner (*Christ and the Spiritual World and the Search for the Holy Grail,* p. 106)