

Supplementary Tables and Diagrams

Figure 1. Long-term variation of the true obliquity of the ecliptic (JPL DE441) from 7600 BCE to 12,400 CE. The vertical red line marks the reference epoch of 7 April 5060 CE ($\epsilon = 23^\circ 03' 32.7438''$), the only moment in the entire 41,000-year obliquity cycle at which the Aries and Pisces rising arcs equal exactly 1h51m36.4268s of Universal Time, yielding the precessional age of 2001.6735789377 years required by the pyramid's metrology and the biblical chronology. SE verification links are provided in Supplementary Table 1 or workbook under Data Availability.

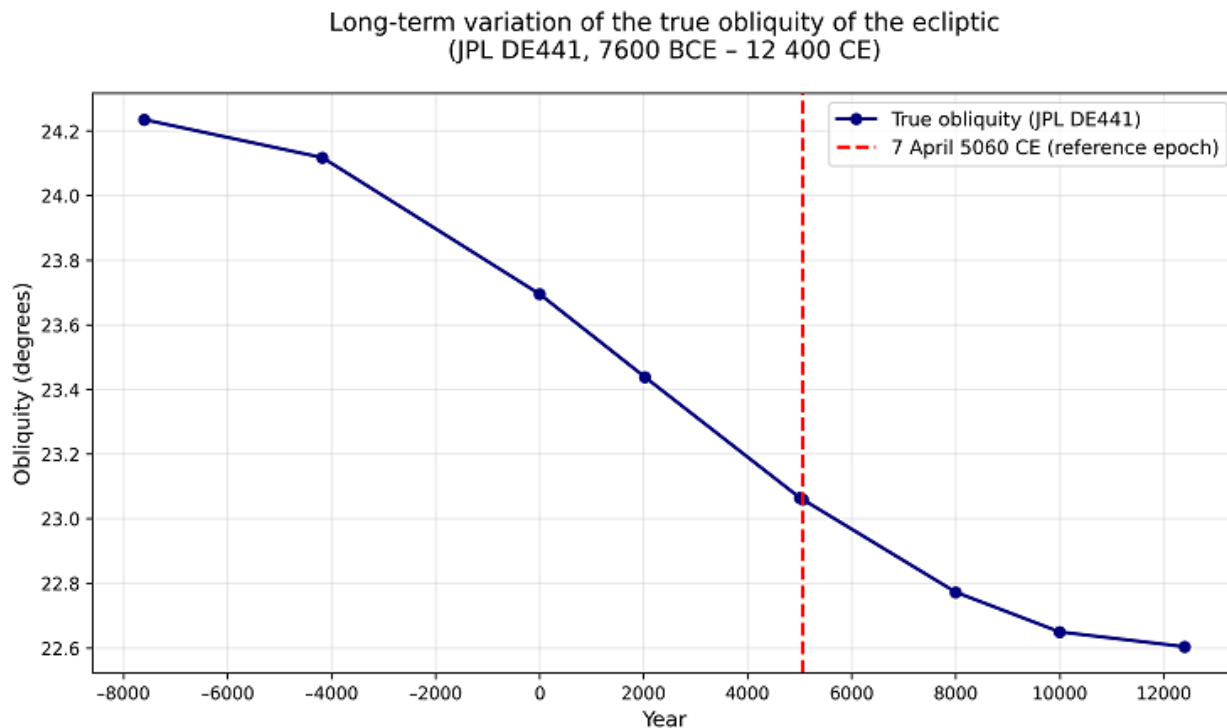


Figure 2. Diurnal transit times and resulting precessional ages for the twelve zodiacal signs at the reference epoch (7 April 5060 CE, JD 3569283.62). Transit times are given in Universal Time (UT) at the terrestrial equator (Swiss Ephemeris / DE441). Scaling by the Great Pyramid's measured base-diagonal sum of 25,826.4 pyramid inches yields a conversion factor of 1.0027377747 pyramid inches per precessional year and a full cycle length of 25,755.8861873455 years. Note: this 25,755.8861873455-year cycle is the effective precessional period produced by the variable rising times at the reference obliquity; it is not the standard mean lunisolar precession rate.

Basis of Interpreting Precessional Years							
Date	UT	JD	Length of Transit Time		Precessional Years	Age	Notes
5060-04-07	8:41:47.8565	3569283.862359450	1.988832247	1:59:19.7961	2140.1823804718	Taurus	6143.529538 Precessional years
5060-04-07	6:42:28.0610	3569283.779491447	1.860118557	1:51:36.4268	2001.6735789377	Aries	5.709069360 Hours of UT
5060-04-07	4:50:51.6341	3569283.701986506	1.860118557	1:51:36.4268	2001.6735789377	Pisces	0.23787789 Fraction of day
5060-04-07	2:59:15.2073	3569283.624481566	1.988832001	1:59:19.7952	2140.1821158920	Aquarius	Length of Sidereal Day 23.9344728067517 hours
5060-04-07	0:59:55.4120	3569283.541613565	2.134667527	2:08:04.8031	2297.1157257300	Capricorn	
5060-04-06	22:51:50.6092	3569283.452669088	2.134667281	2:08:04.8022	2297.1154611502	Sagittarius	
5060-04-06	20:43:45.8063	3569283.363724610	1.988832235	1:59:19.7960	2140.1823684454	Scorpio	Length of Solar Day 24 hours
5060-04-06	18:44:26.0108	3569283.280856607	1.860118557	1:51:36.4268	2001.6735789377	Libra	
5060-04-06	16:52:49.5841	3569283.203351668	1.860118322	1:51:36.4260	2001.6733263843	Virgo	
5060-04-06	15:01:13.1575	3569283.125846731	1.988832247	1:59:19.7961	2140.1823804718	Leo	Length of Precessional Years 25755.886187 * 23.9344728 = 25826.4 years
5060-04-06	13:01:53.3621	3569283.042978728	2.134667516	2:08:04.8031	2297.1157137036	Cancer	
5060-04-06	10:53:48.5587	3569282.954034244	2.134667762	2:08:04.8039	2297.1159782834	Gemini	
5060-04-06	8:45:43.7552	3569282.865089759					

Figure 3. Precessional ages of the twelve zodiacal signs derived from equatorial rising arcs at the reference obliquity of 23°03'32.7438" (7 April 5060 CE). The total raw (rising-time) cycle is 25,755.8861873455 years; when scaled by the epoch-specific sidereal day length and the pyramid's base-diagonal sum, it equals the encoded precessional cycle of 25,826.4 years. The exact equality of Aries, Pisces, and Libra (2001.6735789377 years) and the maximum duration of Gemini (2297.1159782834 years) are direct geometric consequences of this single obliquity value.

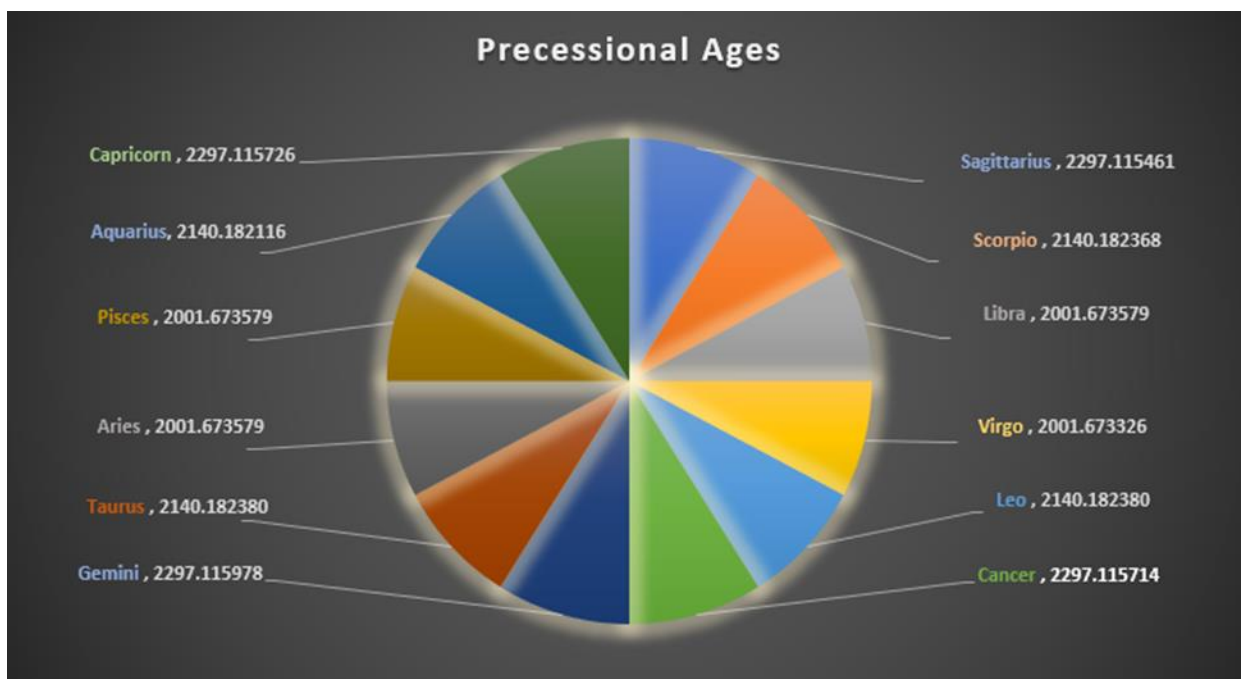


Figure 4. The length of the primary precessional Ages (Taurus, Aries and Pisces) based upon their diurnal rising arcs on the Earth's equator using the reference epoch of 7 April 5060 CE ($\epsilon = 23^\circ 03' 32.7438''$).

Precessional Ages				
Age	Date	UT	JD	Length
Taurus	-4168-11-07	03:44:57.655	199006.65622286	2140.1824
Aries	-2027-01-12	18:29:47.630	980708.27069017	2001.6736
Pisces	-0026-09-16	01:05:22.315	1711819.54539717	2001.6736
Aquarius	1976-06-01	07:40:57.000	2442930.82010417	—
				6143.5295
6143.5295 yrs. = length of Universal Time (UT) for these three Zodiacal Signs to rise on the Earth's equator = 5.70906936 hours divided by 24 hours = 0.23787789 (fraction of solar day) x 25,826.4 years.				

Supplementary Table 1. True obliquity of the ecliptic at selected epochs (Swiss Ephemeris / JPL DE441). All instants are chosen when 0° Pisces is rising on the Equatorial Ascendant (EP). Values before 7601 BCE are omitted due to increasing ephemeris uncertainty. SE verification links are provided in Supplementary Table 1 or workbook under Data Availability.

Date	True Obliquity		Link
-7600-01-01	24.234558472	24° 14'04.4105"	SE
-4175-07-26	24.116978639	24° 07'01.1231"	SE
0001-01-01	23.694711500	23° 41'40.9614"	SE
2022-09-25	23.438306472	23° 26'17.9033"	SE
5000-03-02	23.064902083	23° 03'53.6475"	SE
5060-04-07	23.059095500	23° 03'32.7438"	SE
8000-01-01	22.772378000	22° 46'20.5608"	SE
9999-01-01	22.649318556	22° 38'57.5468"	SE
12400-01-01	22.603699306	22° 36'13.3175"	SE

Supplementary Table 2. Selected Neptune–Pluto conjunctions (JPL Horizons / DE441) illustrating this planetary cycle’s alignment with the chronology.^{3,4} Although the Masoretic Text provides only the year of birth, the Neptune–Pluto conjunction falls within the same calendar year for Enoch (76 days after the year start) and close to the birth years of Saul (482 days after) and Isaac (513 days after) — remarkable proximity for the deepest planetary cycle across millennia (see full table S5 under Data Availability).

Date (UT)	JD	Neptune long.	Pluto long.	Sun long.	Notes
b4544-03-14 11:03	61799.961	18° Aqu 32'43"	18° Aqu 32'43"	18° Aqu 25'44"	Sun 6.5' from conjunction (near cazimi)
b4048-03-23 8:42	242972.862	29° Aqu 27'00"	29° Aqu 27'00"	—	Pre-Adam cycle marker
b3552-03-18 14:35	424132.107	9° Pis 58'48"	9° Pis 58'48"	—	Enoch born 76 days later
b2065-05-28 14:11	967330.091	11° Ari 48'00"	11° Ari 48'00"	—	Isaac born 513 days earlier
b1073-04-27 8:42	1329626.863	0° Tau 32'48"	0° Tau 32'48"	—	Saul born 482 days earlier