Saros Cycle Dates and Related Babylonian Astronomical Texts

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It is natural to ask how well this simple scheme agrees with the actual record of historical eclipses. Table 5 shows the Julian years of all lunar eclipses visible in Babylon from the beginning of Nabonassar's reign in −746 through −238. The dates are arranged to be consistent with our texts where they overlap, and the Cycles are numbered so that Saros Cycle 1 (SC 1) is the first complete Cycle after the beginning of Nabonassar's reign. Horizontal lines indicate the boundaries between groups of eclipses separated by a multiple of six months, and thus correspond to five-month intervals in our texts.

For 16 complete Saros Cycles, beginning with SC 13 in −526 and extending through SC 27 (−257), the scheme works perfectly in the sense that all lunar eclipses visible in Babylon occurred in the given months.[16] In SC 12 and earlier Cycles, however, eclipses at EP 16 occur one month earlier than in our scheme, which shifts the boundary between Groups II and III one EP earlier. Similar shifts occur in the boundaries between Groups I and II and Groups IV and V in SC7 and between Groups III and IV in SC 4. Thus before SC 5, which began in −670, only the boundary of the Cycles themselves−i.e., the five-month interval between Group V of one Cycle and Group I of the next−is consistent with our scheme. This boundary persists from sometime before Nabonassar (−746) through SC 27. In SC 28 the eclipse of −238:Oct 23 extends Group V, so that subsequent cycles begin 1 EP later.

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[16] Lunar eclipses did in fact occur in −274 and −256 (EP 1; SC 27 and SC 28), one month after the indicated date, but neither was visible at Babylon. In the following cycle the corresponding eclipse (−238:Oct 23) was visible at Babylon, thus violating the scheme.

TABLE 5.   Lunar Eclipses Visible at Babylon: −746 to −238

Saros Cycle (beginning year) — Text A — Saros Canon — Solar Saros — S.E. →

LP	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	GP	Group
1	−745	−743	−725	−707	−689	−670	−652	−634	−616	−598	−580	−562	−544	−526	−508	−490	−472	−454	−436	−418	−400	−382	−364	−346	−328	−310	−292	−274	−256		I
2	−742	−742	−724	?	−688	−670	−652	?	−616	−598	−580	−562	−544		−508	−490	−472	−454	−436	−418	−400	?	−363	−345		−309	−291	−274			
3	−742	−742	−724	?	−683	−670	−652	−633	−616		−579	−561			−507	−489	−471	−453	−435			?	−363								
4	−741	−741		−705	−687	−669		−633	−615		−579			−525	−508	−489		−452	−435	−417		−381	−363	−344	−326	−308	−290	−272	−254		
5	−741	−741	−723		−687	−669		−632	−614		−578	−560		−524	−506	−488	−470	−452	−434	−416	−398	−381	−362	−344	−325	−308	?	−271	−253		
6	−741	−741	−723		−687	−669	−647	−632	−614		−578	−560		?	−506		−470	−452	−434		−398	−380	−362	−344	−325	?		−271	−253		
7																				−416	−397	−379		−325	−325	−307		−271	−253		
8	−739		−703	−685				−631	−613	−595		−559	−540	−522	−504	−486		−450	−432		−396			−345		−305			−251		II
9	−739		−703	−685		?	−649			−595	−576				?	−486	−468	−450				?				−305	−287	−269	−251		
10	−738	−720	−702	−684	−666	−648		−626	?	−594	−576	−540	−521			−485	−467	−449	−431	−413	−396	−377	−359	−341	−323	−305	−287		−251		
11	−738	−720	−701	−684	−666		−630	−626	?	−594	−576	−540	−521	−503		−485	−467	−449		−413	−395		−359			−305	−286	−268	−250		
12		−719	−701	−683	−665	−647		−625		−593	−575	−559	−521	−521		−484	−466	−448	−412	−413	−394	−358	−358	−340	−322?	−304		−268	−250		
13	−719		−701	−682	−665	−647		−625	−611		−575	−557	−538	−520	−502	−484	−466			−412		−358				−304	−286	−268		−249	
14													−538												−322	−303				−249	
15													−537							−412		−375		−339	?	−285				−249	
16	?	−717	−699		−663		−645		−609	−591		−555			−501		?	−447	?		−392	−375	−356	−338		−301	−283	−265	−247		III
17	−735	−717		−681	−663			?	−609			−555	−536	−518		?	−464			−410	−392		−356	−337		−301	−283	−265			
18	−735	−716	−698	−680		−662	−644	−626	−608	−590	−572	−554	−536		−500	−482	−464	−446	−427	−409	−391	−373	−355	−337		−300	−283	−265	−247		
19	−734				−680	−661		−626			−571	−553	?		−499	?	−464	−445	−427	−409	−391	−372	−354		−319	−300	−264	−264	−246		
20		−716			−679	−661	−640	−625	−607		−571	−553		−517	−499	?	−463	−445	−427	−409	−390	?		−318	−318		−282	−264	−246		
21									−607		−571	−553			−499						−390		−336		−318				−245		
22													−537					−447		−408				−336							
23	−732	−696		−678		−660	−642	−623	−605	−587	−551	−551	−533		−497	−479		−443		−407	−389		−353	−335					−245		IV
24	−731	−696				−659			−605		−551				−497		?		?			−370			−316	−298			−243		
25	−731	−713	−695	−677		−659	−641	?	−605	−586	−550		−532	−514	−496	−478	−460	−443	−424	−406	−389	−370	−352			−298			−243		
26	−713	−713	−695			−658	−640	?	−605	−586	−550		−532		−496	−478	−460	−442	−424	−406	−370	−370	−351	−333	−316	−298	−279	−261	−243		
27	−712	−712	−694				−640		−586	−586			−532			−478		−441	−424	−405	−387	−369	−351	−332		−297					
28	−730	−712		−676				−622	−604	−567	−549	−549	−528	−513	−495	−477	−459	−441	−423	−405	−387	−369	−351	−333	−315	−297	−279	−260	−242		
29																	?					?		?	?	−297	?	−260	−242		
30													−527			−477		−423			−386	?		−332	−314						
31	−746	−710	−692		−678	−660	−638		−602	−584	−566	−548	−533	−512	−493		−457	−439		−403	−385					−294	−276		−240		V
32	−746	−710	−692			−638	−638		−602	−584	−566	−548	−533	−511		−457	−457	−439		−403		−349		−335							
33	−745	−709	−691			−655	−637			−583	−565	−529	−529	−511		−475	−456			−402	−385	−366	−348			−294	−276		−240		
34	−745		−691	−673			−637	−619	−605	−583	−565	−529	−529	−511	?	−475	−456		−420	−402	−384	−366	−348	−330	−312		−276	?			
35	−727		−691	−672	−654			−618	−600	−582	−546	−546		−510	−492	−474	−456	+438	−420	−401		−365	−347		−311	−293	−275		−239		
36	−726	−708	−690	−672		−654		−618	−600	−582	−546		−528	−510	−474	−474	?			−401		−365	−347		−311	−293		−257			
37	−726		−690		−672		−636					−527						−419						−332		−293			−238		
38																					−386								−238		

( ) : eclipse belonging to previous group, but not visible at Babylon
{ } : eclipse visible at Babylon