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Saros Cycle Dates and Related Babylonian Astronomical Texts

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That some such scheme was used for earlier dates is suggested by the use of the term "5-itu" in several early eclipse reports, since the term can only refer to the interval

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

---S.E.-->

<--------------Saros Canon-------------------->

Saros Cycle (beginning year) <------------ Text A ------------------> |---------Solar Saros----------| - -

EP	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	Grp
		-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	
1		-743		-707	-689	?	-652	?	-616	-598		?	-544			-490												|_{}_	_{}_	
2		-742	-724	?	-688	-670	-652		-616	-598		-562	-544		-508	-490		-454	-436		-400	?	-363	-345		-309	-291			
3		-742	-724	?	-688	-670		-633	-615		-579	-561	?		-507	-489		-453	-435			-381	-363							
4		-741		-705	-687	-669	?	-633			-579			-525		-489	-471		-435	-417		-381	-363	-344	-326		-290	-272		I
5		-741	-723		-687	-669		-632	-614		-578	-560		-524	-506	-488		-452	-434			-380	-362		?	-308	?		-254	
6									-614			-560		?	-506		-470	-452		-416	-398		-362	-344	-325	-307		-271	-253	
7																					-397	-379			-325	-307		-271	-253	
8		-739		-703	-685		?	-631																						
9		-739		-703	?	?	-649		-613	-595		-559	-540		-504	-486		-450	-432		-396	?								
10			-720	-702		-666	-648			-594	-576			-522	?		-468	-450												
11		-738	-720		-684	-666		-630	?	-594	-576		-540	-521		-485	-467		-431	-413		-377	-359		-323	-305		-269	-251	
12			-719	-701		-665	-647			-593	-575		-539	-521	?		-467	-449		-413	-395		-359	-341		-305	-287		-251	
13			-719	-701		-665	-647		-611		-575	-557		-521	-502		-466	-448		-412	-394		-358	-340		-304	-286			II
14													-538	-520		-484	-466			-412	?		-358		-322	-304		-268	-250	
15																										-303			-249	
16		?	-717	-699		-663	-645		-609	-591			-537									-375		-339	?		-285		-249	
17		-735	-717		-681	-663		?	-609			-555		?	-501	?	?	-447	?		-392	?								
18		-735	-716	-698	-680		-644	-626		-590	-572		-536	-518			-464			-410	-392		-356	-338						
19		-734			-680	-662		-626	-608	?		-554	-536	?	-500	-482	-464	-446	?	-409	-391	?	-355	-337	?	-301	-283	-265		
20			-716	?	-679	-661	?	-625	-607		-571	-553		?	-499	?		-445	-427		-391	-373			-319	?		-265	-247	III
21					-679			-625	-607		-571	-553		-517	-499		-463	-445	-427	-409		-372	-354		-318	-300		-264	-246	
22																		?		-408	-390			-336	-318		-282	-264		
23		-732		-696	-678																								-245	
24			-714	-696		-660	-642		-605	-587		-551	-533		-497	-479														
25		-731	-713		-677	-659		-623	-605			-551			-497		?	-443		-407	-389		-353	-335		-298	?			
26			-713	-695		-659	-641	?	-605	-586	?	-550	-532	-514	-496	-478		-442	-424		?	-370			-316	-298				
27			-712	-694		-658	-640			-586			-532			-478	-460		-424	-406		-370	-352		-316	-298	?	-261	-243	IV
28		-730	-712		-676	-658		-622	-604		-567	-549		-513	-495		-459	-441		-405	-387		-351	-333		-297	-279			
29												-549	-531		-495	-477			-423			-369	-351	?	-315	-297	?	-260	?	
30																					-386	?		-332	-314		-278	-260	-242	
31	-746		-710	-692			-638	-620																						
32	-746		-710	-692		-656	-638		-602	-584	-566	-548		-512	-493		-457	-439		-403	-385		-349							
33	-745		-709	-691		-655	-637			-583	-565		-529	-511			-457			-403										
34	-745	-727		-691	-673		-637	-619		-583	-565		-529	-511		-475	-456		-420	-402		-366	-348		?	-294	-276		-240	
35		-726	-708		-672	-654		-618	-600		?	-546		-510	-492	-474		‡438	-420		-384	-366		-330	-312		-276	?		V
36				-690			-636	-618		-582	-564		-528	-510		-474	-456		-419	-401		-365	-347		-311	-293	-275		-239	
37													-527			-473	?		-419	-401		-365	-347		-311	-293		-257	?	
38																													-238	

__{}_ : eclipse belonging to previous group, but not visible at Babylon

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between eclipse possibilities.[17] The term is found in the following list of eclipse reports, where "EP-1" indicates that the five-month interval occurred 1 EP earlier than in our texts. In each case it correctly denotes the boundary between groups as evidenced in Table 5, whether an eclipse was visible or not. This suggests the existence of some scheme similar to that of our texts, but reflecting the actual distribution of eclipses in the earlier period.

Lunar Eclipse Reports with "5-itu"

Date	SC:EP	Visible?	"5-itu"	Reference
−746:Feb 6	0:31	Yes	EP-1	LBAT 1413
−685:Apr 22	4: 8	Yes	EP-1	LBAT 1416
−667:May 2	5: 8	No	EP-1	LBAT 1416
−649:May 13	6: 8	Yes?	EP-1	LBAT 1416
−631:Jun 4	7: 8	Yes	EP-1	LBAT 1416
−598:Feb 19	9: 1	Yes	EP	LBAT 1420*
−591:Apr 2	9:16	Yes	EP-1	LBAT 1420*
−588:Jul −	9:23	No	EP-1	LBAT 1420*
−577:Jun −	10: 8	No	EP-1	LBAT 1420*
−526:Apr −	13: 1	No	EP	B.M. 37276*
−422:Aug −	18:31	No	EP-1	LBAT 1426

* = unpublished

The earliest use of the term "5-itu" to designate the beginning of a new group of eclipse possibilities occurs in the report of the eclipse of −746:Feb 6. This eclipse was the first in Nabonassar's reign and is the earliest detailed eclipse report which we have from Babylon.[18]

[17] While theoretically possible, eclipses separated by five months are seldom, if ever, observed and eclipses separated by eleven months are rare. In the 500 odd years covered by Table 5 there is only one instance of two eclipses separated by five months which might have been visible in Babylon (EP 16 & 17; SC 21). The first of these had a magnitude of only 0.1^{d}, while the second was only marginally visible, if at all, before sunrise.

[18] The eclipse occurred in month XII of the accession year of Nabonassar (i.e., at EP 31; SC 0) and begins a series of consecutive eclipse reports covering at least Group V of SC 0.