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MOVABLE *W3GJ* AND NUMERATION OF LUNAR DAYS IN ANCIENT EGYPT

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The ancient Egyptians celebrated the *w3gj* feast, an integral part of the Osirian cult. Data from the Illahun archive evidence that there were two instances of it: a fixed one, which fell on a specific civil date, and a movable one associated with a specific phase of the moon. There is disagreement about the lunar day and month on which the movable feast took place. The aggregation of the Illahun lunar dates into a 'date net' indicates that the disagreement is due both to peculiarities of the datasets of previous studies and to the incorrect numeration of lunar days in Parker's list, which has been the standard for more than 70 years. Analysis of the lists of lunar days from the Ptolemaic Period also reveals the erroneous position of one of the days; when it is set to the proper position, the symmetry of the phases relative to the day of full moon improves. Based on the corrected numeration of lunar days, it is concluded that the movable *w3gj* in the original list fell on the 17th day of the second month after the emergence of Sopdet (the heliacal rising of Sirius in modern terms). Further research is needed to examine the effect of the proposed correction on the chronology of the Middle Kingdom.

Keywords: movable *w3gj* feast, *w3gj* dates, lunar month, lunar days numeration, moon, phases, Sirius, heliacal rising

The earliest attestations for *wꜣgj* occur in feast lists from private tombs of the 4th Dynasty. Two different instances[1] of it are recorded in the Illahun archive: a civil one, fixed on I *ꜣḫt* 17/18[2]; and a lunar one, which fell on different civil days; therefore, it is often called 'movable'. The lunar *wꜣgj* follows *prt Spdt* in the Middle Kingdom lists, and its dates were calculated by the Egyptians according to certain rules that need to be clarified.

Days of the lunar month (LM) had names, some of which denote the phase of the moon: *ꜣbd* – 'new crescent day'; *dnjt* – 'first/last quarter day'; while some others contain a numeral corresponding to the ordinal number of the lunar day (LD): *snt* – '6th day'; *smdt/mḏdj-nt*[3] – '15th day', 'day of full moon' [Parker 1950, *11–12, §36–41*].

The movable *wꜣgj* dates are not accompanied by information about the corresponding lunar day, but pBerlin 10016 indicates that the feast took place two days after the full moon (*2-nw n mḏdj-nt*) [Krauss 2006b, *425*], and pBerlin 10165 reports a three-day interval between these events (II *šmw* 19 and II *šmw* 22, respectively) [Luft 1992, *101*; Krauss 1994a, *8*; Depuydt 2000, *177*]. Thus, in the first case, the feast falls on LD 17 (= 15 + 2), and in the second, on LD 18 (= 15 + 3).

Due to the scarcity of documentary evidence, there is no consensus about the day of the movable *wꜣgj* among scholars: Krauss [1998, *53*; 2006, *425*; 2021, *95*] believes that the feast falls on LD 17 (two days difference from the full moon); Luft's [1992, *201–202*] 'date net' indicates that it was LD 18 (whereas the full moon unexpectedly falls on LD 16; two days difference); Depuydt [2000, *177*] and Spalinger [1994, *49*; 2013, *620*] accept LD 18 (three days difference) following Luft.

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[1] pBerlin 10007 lists two different *wꜣgj* in the same year: a movable one preceded by *prt Spdt* (recto, lines 18–19; see [Borchardt 1935, *9*]) and a civil one preceded by *wp rnpt* (recto, lines 22–23; see [Krauss 1985, *90–91*]; for the hieroglyphic transcription see [Luft 1992, *45*]).

[2] See [Posener-Kriéger 1986, *1137*; Krauss 2021, *93–94*] for details.

[3] *smdt* – traditional transcription [Parker 1950, *11*]; *mḏdj-nt*, '15(10+5)-th' – ordinal (see [Parker 1950, *71*, n. 39; Luft 1992, *163*]).

The method used by Luft [1992, *201*; 1994, *40–41*] to find the lunar day number is to calculate the distance between LD 1, *psḏ(n)tjw*, and the sought phase/event. The distance method sounds good, but three date selection rules should be applied to obtain accurate results:

1. an original date of the phase from the document should be used, not a *calculated* one, since the calculation assumes a known fixed interval between phases, and this is not always true[4];

2. a document with conflicting dates (a discrepancy of two or more days) should be excluded;

3. dates of the same phase/event must be consistent within the acceptable error margin (less than one day), i.e., they must correspond approximately to the same lunar day.

Four sets of dates need to be checked:

I. *psḏ(n)tjw*. The event is mentioned[5] in pBerlin 10090, pBerlin 10056 (presumably as the end of a month interval [6 times][6]) and 10056a, pBerlin 10006 (presumably as the end of a month interval[7]). The dates from pBerlin 10003, pBerlin 10248 and pBerlin 10282 used by Luft to calculate *psḏ(n)tjw* are *ꜣbd* originally and therefore they cannot be used (rule 1). There are no significant discrepancies in the dates. The dataset passes consistency check (**Table 1**).

[4] "*The time that must elapse after conjunction for* [new crescent] *visibility to be possible is variable*" [Parker 1950, *4, §11*], so, for example, subtracting 1 day from *ꜣbd* to get *psḏ(n)tjw* will affect the accuracy of the calculation (**Table 5**).

[5] pBerlin 10090: King = [Amenemhat III], Year = 3, Date = III *šmw* 17; pBerlin 10056: King = [Amenemhat III], Year = 30, Date = III *šmw* 25; pBerlin 10056a: Year = 8, Date = IIII *ꜣḫt* 26; pBerlin 10006: King = [Amenemhat III], Year = 32, Date = III *ꜣḫt* 7. See [Krauss 2006b, *424–426*] for more details on the dates.

[6] It is safe to use only the first of the six date pairs from this document, as the rest may not be related to observations, but be calculated [Depuydt 1997, *180–182*].

[7] See [Luft 1992, *42–44*; Krauss 2006b, *426*] for more details on identification.

	10090		10056a		10056		10006	
	ΔLM	Dev.	ΔLM	Dev.	ΔLM	Dev.	ΔLM	Dev.
10090	–		-54.994	0.18	-333.993	0.21	-349.976	0.71
10056a	54.994	-0.18	–		-278.999	0.03	-294.982	0.53
10056	333.993	-0.21	278.999	-0.03	–		-15.983	0.50
10006	349.976	-0.71	294.982	-0.53	15.983	-0.50	–	
Avg. dev.		-0.36		-0.13		-0.09		+0.58

Table 1. *Psḏ(n)tjw* dataset consistency check. Legend: ΔLM – difference in lunar months; ΔLM = ΔD [diff. in days] : 29.53059 D/LM. Dev. – deviation in days from the expected same phase (row). Dev. = (ΔLM – Round(ΔLM)) * 29.53059 D/LM. Avg. dev. – adjustment value in days to bring the examined date (col.) into line with other dates (negative/positive = earlier/later dates).

II. *ꜣbd*. The event is mentioned[8] in pBerlin 10003, pBerlin 10248, pBerlin 10056 (presumably as the start of a month interval [6 times]; see n. 6), pBerlin 10006 (presumably as the start of a month interval), pBerlin 10282a and 10282b. The *ꜣbd – smdt* pair from pBerlin 10282b shows significant inconsistency[9] and should be excluded (rule 2). The dataset passes consistency check (**Table 2**).

	10282a		10003		10248		10056		10006	
	ΔLM	Dev.	ΔLM	Dev.	ΔLM	Dev.	ΔLM	Dev.	ΔLM	Dev.
10282a	–		-42.024	-0.71	-99.016	-0.47	-540.016	-0.47	-556.034	-1.00
10003	42.024	0.71	–		-56.992	0.24	-497.992	0.24	-514.009	-0.27
10248	99.016	0.47	56.992	-0.24	–		-441.000	0.00	-457.018	-0.53
10056	540.016	0.47	497.992	-0.24	441.000	0.00	–		-16.017	-0.50
10006	556.034	1.00	514.009	0.27	457.018	0.53	16.017	0.50	–	
Avg. dev.		+0.66		-0.23		+0.07		+0.07		-0.58

Table 2. *ꜣbd* dataset consistency check.

[8] pBerlin 10003: King = [Senusret III], Year = 9, Date = III *prt* 10; pBerlin 10248: King = Senusret III, Year = 14, Date = II *ꜣḫt* 18; pBerlin 10056 (see n. 5): Date = II *šmw* 26; pBerlin 10006 (n. 5): Date = II *ꜣḫt* 9; pBerlin 10282a: King = [Senusret III], Year = [6], Date = II *ꜣḫt* 14; pBerlin 10282b: Date = III *ꜣḫt* 13. The 19-year duration of the reign of Senusret III is used [Schneider 2006, *172*].

[9] There are two dates, III *ꜣḫt* 13 (*ꜣbd*) and III *ꜣḫt* 29 (*smdt*), referring to the same year (presumably Year 6 of Senusret III) in pBerlin 10282b. Since the interval between LD 2 and LD 15 is less than 14 days, these dates should be excluded, because they are separated by a two-day longer interval (29 – 13 = 16 days) (see also [Depuydt 1997, *150*; Depuydt 2000, *179*]).

III. *smdt*. The event is mentioned[10] in pBerlin 10003, pBerlin 10165, pBerlin 10016, pBerlin 10282a and 10282b. The date from pBerlin 10282b should be excluded (see *3bd*). The consistency check (**Table 3**) indicates that the date from pBerlin 10165 needs to be corrected (II *šmw* 19 –> II *šmw* 20).

	10282a		10003		10165		10016	
	ΔLM	Dev.	ΔLM	Dev.	ΔLM	Dev.	ΔLM	Dev.
10282a	–		-43.006	-0.18	-82.965	1.03	-156.990	0.30
10003	43.006	0.18	–		-39.959	1.21	-113.983	0.50
10165	82.965	-1.03	39.959	-1.21	–		-74.025	-0.74
10016	156.990	-0.30	113.983	-0.50	74.025	0.74	–	
Avg. dev.		-0.38		-0.63		**+0.994**		+0.02

Table 3. *Smdt* dataset consistency check.

IV. *w3gj*. The event is mentioned[11] in pBerlin 10165, pBerlin 10016, pCairo 58065. There are no significant discrepancies in the dates. The dataset passes consistency check (**Table 4**).

	10165		10016		58065	
	ΔLM	Dev.	ΔLM	Dev.	ΔLM	Dev.
10165	–		-73.991	0.27	-197.998	0.06
10016	73.991	-0.27	–		-124.007	-0.21
58065	197.998	-0.06	124.007	0.21	–	
Avg. dev.		-0.16		+0.24		-0.07

Table 4. *W3gj* dataset consistency check.

The distance method can now be applied to the selected dates to calculate the average LD for *3bd*, *smdt*, *w3gj*, if *psḏ(n)tjw* is LD 1 (see **Table 5**).

[10] pBerlin 10282a (see n. 8): Date = I *3ḫt* 29; pBerlin 10282b (n. 8): Date = III *3ḫt* 29; pBerlin 10003 (n. 8): Date = III *prt* 24; pBerlin 10165: King = [Senusret III], Year = [12], Date = II *šmw* 19; pBerlin 10016: King = [Senusret III], Year = 18, Date = II *šmw* 15.

[11] pBerlin 10165 (n. 10): Date = II *šmw* 22; pBerlin 10016 (n. 10): Date = II *šmw* 17; pCairo 58065: King = [Amenemhat III], Year = 9, Date = II *šmw* 29.

		psḏ(n)tjw = LD 1											
		10090			10056a			10056			10006		
		ΔD	ΔLM	LD	ΔD	ΔLM	LD	ΔD	ΔLM	LD	ΔD	ΔLM	LD
ꜣbd	10282a	-6113	-207.006	0.83	-7737	-262.000	1.01	-15976	-540.998	1.05	-16448	-556.982	1.54
	10003	-4872	-164.981	1.55	-6496	-219.975	1.73	-14735	-498.974	1.76	-15207	-514.958	2.25
	10248	-3189	-107.990	1.30	-4813	-162.984	1.49	-13052	-441.982	1.52	-13524	-457.966	2.01
	10056	9834	333.011	1.31	8210	278.017	1.50	-29	–	–	-501	-16.965	2.02
	10006	10307	349.028	1.82	8683	294.034	2.01	444	15.035	2.04	-28	–	–
	Avg.			1.36			1.55			1.59			1.96
	LD	1.62											
smdt	10282a	-6128	-207.514	15.36	-7752	-262.507	15.55	-15991	-541.506	15.58	-16463	-557.490	16.07
	10003	-4858	-164.507	15.55	-6482	-219.501	15.73	-14721	-498.500	15.76	-15193	-514.483	16.25
	10165	-3677	-124.515	15.32	-5301	-179.509	15.51	-13540	-458.508	15.54	-14012	-474.491	16.03
	10016	-1492	-50.524	15.06	-3116	-105.518	15.24	-11355	-384.517	15.28	-11827	-400.500	15.77
	Avg.			15.32			15.51			15.54			16.03
	LD	15.60											
wꜣgj	10165	-3675	-124.447	17.32	-5299	-179.441	17.51	-13538	-458.440	17.54	-14010	-474.423	18.03
	10016	-1490	-50.456	17.06	-3114	-105.450	17.24	-11353	-384.449	17.28	-11825	-400.432	17.77
	58065	2172	73.551	17.27	548	18.557	17.45	-7691	-260.442	17.48	-8163	-276.425	17.97
	Avg.			17.22			17.40			17.43			17.92
	LD	17.49											

Table 5. Average LD calculation for *ꜣbd*, *smdt* and *wꜣgj*, if *psḏ(n)tjw* is taken as LD 1. Legend: ΔD – difference in days; ΔLM – difference in lunar months; ΔLM = ΔD : 29.53059 D/LM; LD – lunar day number. The *ꜣbd* – *psḏ(n)tjw* pairs from pBerlin 10056 and pBerlin 10006 have been excluded from the calculation to achieve greater accuracy[12].

[12] Krauss [2021, *94*; and private communication] points out the incorrectness of dividing the interval between events by the average lunar month. This is true for short intervals, but the error becomes negligible for long intervals, because the longer the sequence of months, the better it fits the average month. Two short intervals in **Table 5** (pairs from pBerlin 10056 and pBerlin 10006) should therefore be excluded (pBerlin 10056: ΔLM = -29 : [29.25(min.)/29.53(avg.)/29.83(max.)] = [-0.99/-0.98/-0.97]).

The results obtained explain the aforementioned contradictions: firstly, the three-day interval between *smdt* and *w3gj* from pBerlin 10165 turns out to be inconsistent with the rest of the data; secondly, as can be seen from **Table 5**, for all four *psḏ(n)tjw* dates, taken as LD 1, the same pattern of relative positions of *3bd* / *smdt* / *w3gj* (see 'Avg. LD' rows) is observed: *3bd* / *3bd* + 14 / *3bd* + 16, where *3bd* varies from 1.36 to 1.96, therefore the full moon occurs at both LD 15 and LD 16, and *w3gj* two days after it, respectively. The discovered pattern indicates that if *psḏ(n)tjw* is taken as the reference point, then the same phase is distributed between two adjacent days of the lunar cycle, and if *3bd* is the reference point, then the phase falls on the same day. How to explain such a distribution for the standard *psḏ(n)tjw* = LD 1?

It is necessary to remember that Parker's [1950, *11–12, §36*] list of days of the lunar month consists of 30 names, one for each lunar day. However, we know that a synodic month averages 29.53059 days (varies from 29.25 to 29.83 days), that is, if from the beginning of the lunar month the days are sequentially called by names from the list, then after two or three months a loss of synchronization with actual phases will be found. Therefore, in order to maintain synchronicity, the Egyptians had to skip one day in some[13] months. What day could they skip? It is easy to demonstrate that this was one of the days of invisibility of the moon[14], *prt Mn* and *psḏ(n)tjw*, namely the second of them.

If the observer does not know exactly when the new lunar month will begin, he must turn to observations. Uncertainty regarding the phase exists only when the moon is not visible, and therefore, without calculations, it is not known exactly when a new crescent will appear – today or a day later[15]. Thus, the first appearance of a new crescent is an obvious synchronization point, and in order for the lunar month to correspond to reality, the Egyptians had to use a simple rule: if today is the turn of the second day of the moon's invisibility, *psḏ(n)tjw*, but the new crescent has already appeared, *psḏ(n)tjw* is

[13] See [Parker 1950, *6, §18*] for details.

[14] "*In Egyptian latitudes the new crescent appears in ca. 70 % of the cases after a single day of invisibility, in ca. 30 % of the cases after invisibility lasting two days*" [Krauss 2006a, *388*].

[15] Krauss [2006a, *388–389*] describes this problem exhaustively.

skipped, and the current day becomes *ꜣbd* (and possibly vice versa)[16]. With this scheme, the new crescent always fell on *ꜣbd*; *psḏ(n)tjw* functioned as an intercalary day[17], and its top position in the list of lunar days can be explained by the fact that the Egyptians regarded intercalary days as *ḥrjw* days – ‘which are upon’, ‘which are higher’ [Erman and Grapow 1929 (*Wb*. III), *133*] (for example, the epagomenal days of the civil calendar were called *ḥrjw-rnpt*, ‘those over the year’).

Obviously, the numbering of the days of the lunar month, starting from the intercalary day, does not make sense, while the numbering from the first day of the new crescent visibility, *ꜣbd*, is, on the contrary, natural[18]. Moreover, this numbering explains the temple service month intervals[19] and the absence of *psḏ(n)tjw* in early private feast lists[20] [Krauss 2006a, *386*]; the month-feast, *ꜣbd*, turns out to coincide with the *real beginning* of the corresponding month, and not with its second (or even third) day; the other phases are not delayed relative to the corresponding days, as in Parker’s scheme [1950, *14, Fig. 10–11*; 3rd day]. In the light of the foregoing, the sequence of days in Parker’s list should not begin with number one, but with an unnumbered intercalary (**Table 6)**.

Continuing the analysis of Parker’s list, it should be noted that two instances of the quarter, *dnjt* (LD 7, LD 23), are separated by an overly long interval, 16 days, instead of the expected average interval of

[16] If it is *ꜣbd*’s turn, but the new crescent is still not visible, *psḏ(n)tjw* continues.

[17] The *ꜣbd* dates from pBerlin 10282a and pBerlin 10006 (see corresponding rows in **Table 5**) illustrate two opposite cases when intercalary day is skipped and not skipped, respectively.

[18] “*All that we know of ancient and modern time-reckoning leads to the conclusion that lunar months begin with some observable phase of the moon. “As always,” says Nilsson, “the concrete phenomenon is the starting point”. Most peoples (both ancient and modern) who use a lunar calendar start the month with the new crescent; a few count from full moon; while two East African tribes* […] *begin with the moon invisibility*” [Parker 1950, *9, §25*].

[19] Temple service months in pBerlin 10056 start with *ꜣbd* and end with *psḏ(n)tjw* [Krauss 2006b, *426*]. The pair of dates from pBerlin 10006 seems to be a misidentified *ꜣbd–prt Mn* pair that corresponds to a non-intercalary 29-day temple service month.

[20] Derstine [2016, *42–45*] proposes a different scheme using the same arguments.

29.53059 : 2 = 14.765 ≈ 15 days; and two instances of the unknown phase, *sjꜣw* (LD 14, LD 17), are not symmetrical with respect to the full moon: they are one and two days apart from it. This effect can only be caused by a superfluous day within the ranges of these two pairs, namely, the incorrect position of LD 16, *mspr 2-nw*, which got there by mistake. The list has an element with a similar name, *mspr*, so putting them side by side results in a sequence of *mspr*, *mspr 2-nw* being the first and second 'rib' days[21]. The corrected list of lunar days is as follows (**Table 6**, right side):

Parker			**New proposal**		
LD	Name	Translation/Note	LD	Name	Note
1	*psḏ(n)tjw*		interca-lary	*psḏ(n)tjw*	[2nd day of invisibility]
2	*(tp) ꜣbd*	new crescent day	1 [-1]	*(tp) ꜣbd*	new crescent day
3	*mspr*	'arrival' day	2 [-1]	*mspr*	'rib' days
4	*prt sm*	day of the going-forth of the *sm*-priest	3 [-13]	*mspr 2-nw*	
5	*jḫt ḥr ḫꜣwt*	day of offerings on the altar	4 [0]	*prt sm*	
6	*snt*	6th day	5 [0]	*jḫt ḥr ḫꜣwt*	
7	*dnjt*	part day; first-quar-ter day	6 [0]	*snt*	= 6th day
8	*tp*		7 [0]	*dnjt*	first quarter = 7th day
9	*kꜣp*		8 [0]	*tp*	
10	*sjf*		9 [0]	*kꜣp*	
11	*stt*		10 [0]	*sjf*	
12	?		11 [0]	*stt*	
13	*mꜣꜣ sṯj*		12 [0]	?	
14	*sjꜣw*		13 [0]	*mꜣꜣ sṯj*	
15	*(tp) smdt*	15th day; day of full moon	14 [0]	*sjꜣw*	pre- full moon

[21] Borchardt [1935, *37*, *n. 2*] suspected that *mspr* originated from *spr*, 'rib', since the new crescent is shaped like a rib; see also [Parker 1950, *71*, *n. 42*].

16	*mspr 2-nw*	second ‘arrival’ day	15 [0]	*(tp) smdt*	full moon = 15th day
17	*sjȝw*		16 [-1]	*sjȝw*	post- full moon
18	*jꜥḥ*	day of the moon	17 [-1]	*jꜥḥ*	
19	*sḏm mdwf*		18 [-1]	*sḏm mdwf*	
20	*stp*		19 [-1]	*stp*	
21	*ꜥprw*		20 [-1]	*ꜥprw*	
22	*pḥ spdt*		21 [-1]	*pḥ spdt*	
23	*dnjt*	part day; last-quarter day	22 [-1]	*dnjt*	last quarter = 22th day
24	*knḥw*		23 [-1]	*knḥw*	
25	*stt*		24 [-1]	*stt*	
26	*prt*		25 [-1]	*prt*	
27	*wšb*		26 [-1]	*wšb*	
28	*ḥb-sd Nwt*	day of the jubilee of *Nut*	27 [-1]	*ḥb-sd Nwt*	
29	*ꜥḥꜥ …*		28 [-1]	*ꜥḥꜥ …*	old crescent day
30	*prt Mn*	day of the going-forth of *Min*	29 [-1]	*prt Mn*	conjunction

Table 6. New proposal for the sequence and numeration of lunar days. Differences from Parker’s numeration are in square brackets.

Now *mspr* is accompanied by *mspr 2-nw*, creating the *mspr*-sequence; *smdt* is symmetrically surrounded by two *sjȝw*, in which it is easy to recognize the pre- and post- full moon phases; the interval between quarters is also normalized[22]. If we recalculate **Table 5**, assuming *ȝbd* = LD 1, then *wȝgj* falls on LD 17 (16.85); *psḏ(n)tjw* – on LD 30 (29.91); and *smdt/mḏdj-nt* – on LD 15 (14.96), as indicated by its name.

As for the lunar month in which the movable *wȝgj* was celebrated, data from the Illahun archive show that this feast took place

[22] In both a 29-day month (conjunction ≈ midday of *prt Mn*; *psḏ(n)tjw* is skipped) and a 30-day month (conjunction ≈ end of *prt Mn*; *psḏ(n)tjw* is not skipped), the first quarter falls on LD 7 ([29.25/29.83] * 1/4 = [7.31/7.46]), and the last quarter – on LD 22 ([29.25/29.83] * 3/4 = [21.94/22.37]), counting from the conjunction.

approximately 60 days after the emergence of *Sopdet* (**Table 7**), that is, in the second (not in the first or third)[23] lunar month after the heliacal rising.

Source	**King / Year**	**Movable** *w3gj* **date**	*prt Spdt* **date**[24]	*prt Spdt* / *w3gj* **interval, days**
pBerlin 10165	[Senusret III] / [12]	II *šmw* 22	IIII *prt* 18 – IIII *prt* 26	56–64
pBerlin 10016	[Senusret III] / 18	II *šmw* 17	IIII *prt* 19 – IIII *prt* 28	49–58
pCairo 58065	[Amenemhat III] / 9	II *šmw* 29	IIII *prt* 22 – IIII *prt* 30	59–67
pBerlin 10007	[?] / 1	II *šmw* (–)		
pBerlin 10419	[Amenemhat III] / 38	III *šmw* (–)	IIII *prt* 29 – I *šmw* 8	≥ 53

Table 7. Movable *w3gj* dates from the Illahun archive. The *prt Spdt* dates (Memphis; arc. vis. 9°; 1460 y.) are given as ranges due to different estimates of reign dates. The interval between the lunar *w3gj* and *prt Spdt* averages 60 days.

Summarizing the above, the following conclusions can be drawn:

– it is necessary to return to the earlier views[25] that the original lunar month began with *3bd*;

[23] Some authors assume deviations from the second month to justify the conventional chronology of the Old Kingdom. For example, Luft [1994, *42*], Depuydt [2000, *183–184*], Gautschy *et al.* [2017, *80*] suggest the first lunar month after *prt Spdt* based on the supposed correspondence between the civil and movable *w3gj* dates: Month 1 [I *3ḫt*] Day 18 = LM 1 LD 18. However, the rule for calculating the moveable *w3gj* for the Middle and Old Kingdoms should be the same due to the seasonal nature of the feast.

[24] For the generally accepted reign dates of Senusret III/Amenemhat III: Senusret III = 1872–1852 BCE, Amenemhat III = 1853–1805 BCE [Beckerath 1997, *188*]; Senusret III = 1870–1831 BCE, Amenemhat III = 1831–1786 BCE [Shaw 2000, *482*]; Senusret III = 1837–1819 BCE, Amenemhat III = 1818–1773 BCE [Hornung, Krauss and Warburton 2006, *491*].

[25] See [Parker 1950, *9, §26–28*; Krauss 2006, *387*] for a summary of the earlier views.

– *psḏ(n)tjw* was an unnumbered intercalary day and headed the lunar month due to the fact that intercalary days were regarded by the Egyptians as *ḥrjw* days, 'which are upon/higher [*time unit*]';

– the movable *w3gj* in the Middle Kingdom and earlier took place on 'day of the moon', *jꜥḥ* = LD 17, in the second lunar month after the heliacal rising of Sirius;

– the list of lunar days was corrupted sometime after the Middle Kingdom: *mspr 2-nw*, presumably as a result of the omission, was moved down to the position in which it appears in the lists of the Ptolemaic temples[26].

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[26] Parker's list is based on Brugsch's [1883, *45–48*] compilation, which includes data from: (e) – "*Pronoas des Tempels von Dendera*", (e*'*) – "*Pronoas von Edfu*", (e*"*) – "*nördlichen Osiris Tempels auf dem Dache des grossen Tempels von Dendera*", (e*'"*) – "*gelegentliche Varianten aus dem alten (A), neuen (N) und Ptolemäer Reiche (P)*".

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РУХОМИЙ *W3GJ* І НУМЕРАЦІЯ МІСЯЧНИХ ДІБ У СТАРОДАВНЬОМУ ЄГИПТІ

Стародавні єгиптяни відзначали свято *w3gj*, невід'ємну частину культу Осіріса. Дані з архіву Іллахун свідчать про те, що існувало два його різновиди: фіксоване свято, яке припадало на конкретну цивільну дату, і рухоме, пов'язане з певною фазою Місяця. Існує розбіжність щодо доби та місяця, в які відбувалося рухоме свято. Агрегація місячних дат Іллахуна в "мережу дат" вказує на те, що розбіжність пов'язана як з особливостями наборів даних попередніх досліджень, так і з неправильною нумерацією місячних діб у списку Паркера, яка була стандартом понад 70 років. Аналіз списків місячних діб періоду Птолемеїв також виявляє помилкову позицію однієї з діб; при правильному її положенні покращується симетрія фаз відносно фази повного Місяця. На підставі виправленої нумерації місячних діб зроблено висновок, що рухомий *w3gj* в оригінальному списку припадав на 17-у добу другого місяця після появи Сопдет (геліакічного сходу Сіріуса за сучасними термінами). Потрібні подальші дослідження, щоб перевірити вплив запропонованої корекції на хронологію Середнього царства.

Ключові слова: рухоме свято *w3gj*, *w3gj* дати, нумерація місячних діб, Місяць, фази, Сіріус, геліакальний схід

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