

20 or 13 Baktuns in one Pictun?

Metaphorical uses of "13" for the Past?

Thompson (1960 pp.314, 316, 148, 149) states his strong view that the Maya thought of the Pictun as composed of 20 Baktuns, not 13 Baktuns, and that this evidence comes from Palenque, Copan, and the Dresden Codex. He believes that the reference to "13 Baktuns" for the 4 Ajaw 8 Kumk'u era event was a holdover from an earlier time, before the 20-based system was extended so far.

My own view is quite different, namely that the earlier system was already consistently base-20, that "13" was used symbolically instead of a number beginning with "0", was originally not a mathematical "13" at all, but was then later reinterpreted so that it became possible to write a 5-position date 12.x.x.x.x in the prior era. Calculations in both the past and future normally continued to treat a Pictun as consisting of 20 not 13 Baktuns, unless they were very short distances before the Era date. This last point agrees with Thompson on how calculations worked

Thompson (1960 Appendix IV p.316) writes:

I have throughout assumed that the baktuns were grouped, not in 13's, but in 20's, for the evidence supporting a vigesimal count of baktuns in Dresden and at Palenque and Copan is too strong to be overridden. I assume that at an early date, when the LC was first invented, the highest period was the baktun and that baktuns were arranged in re-entering series of 13, but that a subsequent desire to extend the range of time led to the invention of the pictun and still greater periods. With that expansion of time, it was essential to fit the baktuns into a vigesimal count. Consequently, 20 baktuns were made the equivalent of one pictun, but by then 4 Ahau 8 Cumku was so strongly established as the cyclic ending of a round of 13 baktuns that it continued to be given that designation, although reckoned as the end of a cycle of 20 baktuns for the purposes of calculation. Should my reconstruction of the higher periods be correct, 4 Ahau 8 Cumku then became the end of 13 calabtuns, with the theoretical LC position 1.13.0.0.0.0.0 4 Ahau 8 Cumku.

One very basic argument in favor of a Pictun consisting of 20 Baktuns is that in positional systems, when an addition reaches the full number of units of a given size, it is notated with a zero and with a carry of one to the position of the next-higher-valued unit. So from "99" in our number system, we add one and reach "100", carrying one unit twice, once into the "tens" position and after that exceeds 9, again carrying one unit into the "hundreds" position.

The same is generally true of the Mayan system. So the date 12.19.19.17.19 has maximum values in its last four positions. Adding a single day causes repeated carries until we end up with 13.0.0.0.0.

So we never see "18" in the WINALs position, and we never see "20" in any other position, perhaps with one or two exceptions.

An exception was brought to our attention by Erik Boot:

Pixoy Stela 5 provides a LC of 9.14.0.0.0, 6 Ajaw 13 Muwan, however written as 9.13.20.0.0, 6 Ajaw 13 Muwan ... The "20" sign is the T683 Moon.Sign with one dot, probably WINAK (as in the "20 captive" statement, /aj wina[a]k ba[a]k/; note optional postfix /-ki/ in Classic texts and /-na-ki/ postfixing in the Dresden, eg. p61, Column1: 11). The "0" is written with the normal T683 Moon.Sign with an inner line of three or two dots ... Why in this way (see Hartig 1980 for an astronomical explanation) ... Why just the T683 Moon.Sign for the winal and k'in positions ...

Previously, also Closs has written on it in 1978 (American Antiquity, which I have not available).

The "Moon sign with one dot" which Boot refers to has sometimes been read as HUN K'AL 'one bundle of twenty'. Since the scribe here was playing with Moon signs (different signs based on it, one for '20', the others for '0'; presumably see also Hartig 1980), it appears we should not be taking this Pixoy case as the norm.

One Pictun into the Future = 20 Baktuns

If one Pictun were really composed of 13 Baktuns, we might expect to see recorded 1.0.0.0.0 instead of 13.0.0.0.0. This is not a conclusive argument, since there may be some symbolic reason for the use of the "13".

Going forward in time, we have a Palenque case of 1 Pictun indeed being calculated as 20 Baktuns not 13. On the Tabet of the Inscriptions, Palenque, Thompson noted the following calculation leading to a Calendar Round anniversary of Pacal's accession.

| | |
|------------------|--|
| 9. 8. 9.13. 0 | 8 Ajaw 13 Pop |
| 10.11.10. 5. 8 | distance number forward Notice 13+5 = 18, 9+10=19, 8+11=19, 9+10=19; |
| | With the addition of one begun by the WINALs, four positions are zeroed. |
| 1. 0. 0. 0. 0. 8 | 5 Lamat 1 Mol (long count implicit, stated to be 8 days after the then-recent ...) |
| 1. 0. 0. 0. 0. 0 | 10 Ajaw 13 Yaxk'in |

To understand the appearance of this in a text, we must assume that for the patrons of this text, finding such an anniversary after the 1 Pictun date was somehow important. After all, the Calendar Round 5 Lamat 1 Mol occurs once every 52 years. Why not choose another one of them? In this case, it is the 80th Calendar Round anniversary of the accession date of the great ruler Pacal. Is there a claim that Pacal's accession will still be remembered after 4220 TUUNs (almost that many years and 460 TUUNs longer than into the future than it had been since the era date)? Or that the calendar round of the Pictun (10 Ajaw 13 Yaxk'in) was somehow important? Or that one or the other was astronomically important? Or ??? This writer (Lloyd Anderson) thinks at least that the Calendar Round may be symbolically important. See the discussion in the next section following here concerning "10" and "13". Note that Yaxk'in means 'first/new sun'.

The sequence of major dates looked forward to in the Temple of the Inscriptions, Palenque, is this:

| |
|------------------|
| 9. 9. 2. 4. 8 |
| 9.10. 0. 0. 0 |
| 9.11. 0. 0. 0 |
| 9.12. 0. 0. 0 |
| 9.13. 0. 0. 0 |
| 10. 0. 0. 0. 0 |
| 1. 0. 0. 0. 0. 0 |

Why do the distances looking forward start accelerating particularly after 9.13.0.0.0? Is this something special or symbolic about "13"? It is here 13 K'atuns not 13 Baktuns, and there is no suggestion that 13 K'atuns forms a single larger unit.

Oddities of interest to possible symbolic uses of "13"

Now that it is clear that the following sort of information is relevant to discussions about 13.0.0.0.0, perhaps we can collect more examples similar to the following.

The text of La Corona Panel 1 (drawing by Yurii Polyukhovich) ends with reference to the dates 9.12.10.0.0, 9.12.15.0.0, and 9.13.0.0.0. Only the first of these is marked with *uht-oom* 'the coming (event)'. These future projections stop with 9.13.0.0.0, which is 9 Baktuns and 13 K'atuns (not 13 Baktuns). We certainly know that there is no "great cycle" consisting of 13 K'atuns, so a similar projection forward to 13.0.0.0.0 does not justify us in assuming the Maya thought of a "great cycle" of 13 Baktuns.

On the "Site Q" Deletaille panel there is a distance number "6.13.0" written at F2-E3-F3. But what works mathematically is "6.0.3", linking calendar rounds corresponding to long counts 9.11.5.7.9 and 9.11.11.7.12. Obviously "13" here did not **mean** "0". Was this simply an arithmetical error? Or does it reflect symbolic uses of the numeral "13"? It may reflect some factor which also accounts for why the Era Date was referred to as 13.0.0.0.0, without implying that 13 Baktuns constitute a larger unit.

Metaphorical Use of "13" for Past Completed

It appears, with the single exception of the Tortuguero Mon.6, that all references to "13 Baktuns" are to the era date 4 Ajaw 8 Kumk'u long in the past. The use of "13" is here anomalous.

There are other anomalous uses of the number "13" for large time units in the past.

Two other arguments for symbolic "13" are the long series of "13"s which appear at Coba and at Yaxchilan.

Yaxchilán Hieroglyphic Stairway 2, Step VII (Graham 1982 *Corpus of Maya Hieroglyphic Inscriptions* vol.3 Part 3 p.160). Here we have ten occurrences of "13" as coefficients of ten glyphs purportedly for large time units, with a perfectly normal five-place long count following. The purely chronological meaning is the same as if none of those "13"s were written. Surely there was some symbolic value.

= 13.13.13.13.13.13.13.13.13.13. 9.15.13. 6. 9 [event follows]
9.15.13. 6. 9

Dresden Codex page 52 Section A col. 4: A sequence of 13 digits "13", which does not affect the calendrics, and may be a long way of referring to 4 Ajaw 8 Kumk'u or to a 12 Lamat date which we could also notate 13.0.0.0.8, depending on how it combines with its surroundings.

13.13.13.13.13.13.13.13.13.13.13.

Cobá. A stela at Cobá also has a very long series of glyph blocks with "13" as coefficients.

Other "13"s in extended Long Counts of more than 5 positions.

Thompson's (1960) Appendix IV deals with calculations involving very large distance numbers. He suggests that our standard 9.15.0.0.0 was at least sometimes thought of as being the same as 1.13.0.9.15.0.0.0 but only by the most expert Maya, not in ordinary usage. This is based on a few cases suggesting that there were unexpressed "13" Kalabtuns and "1" Kinchiltun taken for granted behind certain calculations. This author again suspect symbolic purpose for "13" here.

It is not obvious that many of these "13"s are counting anything at all!
That is a fundamental question here, not usually asked.

Symbolic "13" as "past" "completed".

Words meaning '3' are /ux/ or /ox/ in most Mayan languages. There is also a verbal prefix /x-/ for completed past at least in highland languages. The word /lajun/ '10' also means completed. So /uxlajun/ and similar words for '13' may indeed carry important symbolic meanings, and they may be occurring in texts for this reason not because of any mathematical or calendric need. Such a hypothesis is of course very difficult to test. I hope others figure out ways to do so (and to disprove it if it is wrong).

The above is the sort of reasoning I have been using for years to interpret numerous occurrences of "13". It is simply not purely calendrical when so many digits end up "13". Not likely for a chance date if it were merely historical or chosen in order to satisfy most sets of cycles.

Mark van Stone has been independently coming to somewhat similar conclusions concerning the metaphorical usages of the series of "13" coefficients (personal communication, 22 June 2008).

An exceptional example of a count 2...14, no zero, no one

Just as a curiosity, we should note the surprising example (I think it is standard in the Codex Azoyu) of a non-Mayan, Mixtec-area system of Tzolk'in day numeration (normally 1, 2, ... 13) thus:

2, 3, 4, ... 13, 14

This "crazy" system (with no zero and no "1" in use for these day names, and a number above "13" instead) would seem to imply a historical change of some kind, perhaps a calendar adjustment, which would be worth figuring out if there are any clues. I don't know whether there are. But such "crazy" patterns do typically arise from interfering causes of one kind or another.

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