# Texas Notes on Precolumbian Art, Writing, and Culture

# Groups of Four and Five Day Names in the Dresden Codex Almanacs: The First Twenty-three Pages

### by Ed Barnhart

The set of almanacs in the first twenty-three pages of the Dresden Codex are prognostications as to the results of actions on particular days. Each almanac begins with a vertical column of day names and a horizontal row of numbers which coordinate to mathematically determine the rest of the vertical columns of days not shown. If one wanted to know the prognostications for any given day, 4 Ahaw for example, they would go through each almanac, find all occurrences of 4 Ahaw and read the associated prognostications. As there are over 250 prognostications(there may have once been 260 in total), a Day Keeper must have had a simplified method of determining the vertical columns of day names not included in the almanacs. There are three types of almanacs in the first twenty-three pages; almanacs beginning with four day names, almanacs beginning

with five day names and almanacs beginning with ten day names(two rows of five). Anyone who has worked through the math of these almanacs has recognized recurring patterns of day names. A careful survey of these patterns comes up with two definable sets; four groups of five day names and five groups of four day names. Each vertical column of five day names will be one of four possible groups. Each vertical column of four day names will be one of five possible groups. Almanacs with ten day names at the beginning are simply combinations of two of the four groups of five. This seems like straight forward number manipulation but there is a deeper connection between these two groups. The cycles of four and five can be interlocked in a grid in such a way as to represent all twenty day names:

Table 1

| | A | B | C | D |
|---|---|---|---|---|
| I | MEN | AHAW | CHIKCHAN | OK |
| II | MANIK | EB | KABAN | IK |
| III | KAWAK | KAN | MULUK | IX |
| IV | CHUWEN | KIB | IMIX | KIMI |
| V | AKBAL | LAMAT | BEN | ETZNAB |

In Table 1 the groups of four are represented horizontally and the groups of five vertically. In addition to there being definable groups, order within the groups is also preserved in the almanac columns. For example, Column A's group of five will always retain its order (Table 2):

Understanding that each row and column can and does cycle, the grid in Table 1 can be seen as two separate large cycles working independently and yet interwoven. The entire group of columns may cycle without disrupting the order of the rows and vice-versa (Table 4).

| MEN | MANIK | KAWAK | CHUWEN | AKBAL |
|---|---|---|---|---|
| MANIK | KAWAK | CHUWEN | AKBAL | MEN |
| KAWAK | CHUWEN | AKBAL | MEN | MANIK |
| CHUWEN | AKBAL | MEN | MANIK | KAWAK |
| AKBAL | MEN | MANIK | KAWAK | CHUWEN |

Table 2
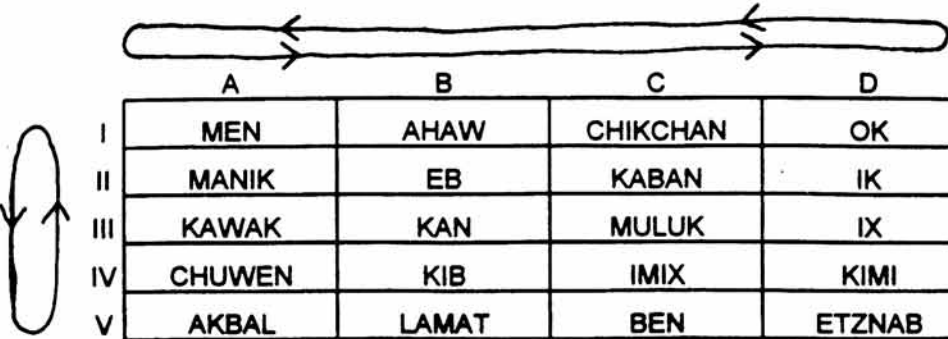
The day name *Men* may not be the first in a given prognostication column but its order in the group, in between *Manik* and *Akbal*, will invariably hold true.

The same holds true for the groups of four. For example, Row I will always retain the order (Table 3):

In this formation, the days in the five groups of four are all five days apart and the days in the four groups of five are all twelve days apart. As they are arranged in Table 1, the day names seem in no way related to their normal order

| MEN | AHAW | CHIKCHAN | OK |
|---|---|---|---|
| AHAW | CHIKCHAN | OK | MEN |
| CHIKCHAN | OK | MEN | AHAW |
| OK | MEN | AHAW | CHIKCHAN |

Table 3

|   | A | B | C | D |
|---|---|---|---|---|
| I | MEN | AHAW | CHIKCHAN | OK |
| II | MANIK | EB | KABAN | IK |
| III | KAWAK | KAN | MULUK | IX |
| IV | CHUWEN | KIB | IMIX | KIMI |
| V | AKBAL | LAMAT | BEN | ETZNAB |

Table 4

|   | A | B | C | D |
|---|---|---|---|---|
| I | MEN | AHAW | CHIKCHAN | OK |
| II | MANIK | EB | KABAN | IK |
| III | KAWAK | KAN | MULUK | IX |
| IV | CHUWEN | KIB | IMIX | KIMI |
| V | AKBAL | LAMAT | BEN | ETZNAB |

Table 5

(Imix=1,Ahaw=20). However, calling them by their numerical position in the normal twenty day cycle may reveal the connection seen in Table 5.

Each row group moves by fives retaining the same number of dots. This is the same pattern of numbers that cycle vertically through the columns of day names in the Dresden Venus pages(46-50). The Venus table numbers, however, cycle within thirteen numbers, not twenty as in the almanacs. The implications of that connection are not understood.

As can be seen from the groups of four and five's ability to cycle through one another, the designations put to the columns and rows in Table 1 are arbitrary. *Men* was chosen to be the top left corner of the grid in order to imitate the only two almanacs in pages 2-23 that do not adhere to the aforementioned groups of four and five. These two almanacs are discussed in more detail in the next section.

## Almanac 34 (16-17A) and Almanac 38 (22-23A)

Of the fifty-two almanacs, only two deviate from the pattern of vertical groups of four and five. Both of these two almanacs have all twenty day names represented. Unlike the other fifty almanacs, these two follow the normal order of the twenty day cycle. Almanac 34 appears to have no numbers attached and is thus the only almanac in which no cycle order an be determined (Figure 1).

Notice, the groups of 4 from Table 1 are shown cycling horizontally across the day names of Almanac 34. The groups of five, however, are corrupted. The opposite case is demonstrated by Almanac 38 (Figure 2).

| Men | Ahaw | Chikchan | Ok |
|---|---|---|---|
| Kib | Imix | Kimi | Chuwen |
| Kaban | Ik | Manik | Eb |
| Etznab | Akbal | Lamat | Ben |
| Kawak | Kan | Muluk | Ix |

Figure 1



| Men | Kib | Kaban | Etznab |
|---|---|---|---|
| Chuwen | Eb | Ben | Ix |
| Manik | Lamat | Muluk | Ok |
| Akbal | Kan | Chikchan | Kimi |
| Kawak | Ahaw | Imix | Ik |

Figure 2

The groups of five are visible in the vertical columns of Almanac 38 but the horizontal rows of four are corrupted. Stranger still, the columns of five are in the correct groups but out of order. No explanation for this is apparent at this time. Regardless, these two almanacs are apparently reconciling the natural order of the twenty day names with the order created for(or rather employed by) the almanacs. Both start with *Men* in the top left corner.

## The Groups of Ten

There are some cases in which there are ten day names represented at the beginning of an almanac. Without variation, these are a combination of either columns A and C or columns B and D. Columns A and B never mix, neither do columns C and D. There are a total of seven almanacs that have ten days names represented. Of those seven, three are two columns of day names interwoven together,

thus deviating from the standard groupings. Despite this, the ten day names are associated with all prognostications in the almanac and thus still may be accurately placed in the prognostication index chart that will be presented at the conclusion of this paper.

### Directional Associations

In the final four pages of the Dresden Codex (pages 42-45), in register C, the groups of five day names occur across the top of each page. They are in the order displayed in Table 1 and separated by page. The texts of these pages begin with a direction. If indeed the four groups of five can be connected to directions, it may be indicated here. Here are the possible group associations:SOUTH-ahaw, lamat, kib ,kan ,eb. EAST-chikchan , ben, imix, muluk, kaban. NORTH-ok, eztnab, kimi, ix, ik. WEST-men, akbal, chuwen, kawak, manik.

### Quick Method of Obtaining All Dates In A Given Almanac

It is not necessary to calculate across the horizontal rows for each of the vertical day names which appear on the far left of the almanac, be they four, five, or ten day names. Understanding that each vertical column must contain one of the groups of four or five in their locked order, only the top row of day names, extending off the first day name in the far left column, need be calculated. Once the top row has been identified the columns can be completed by using the grid in Table 1. Groups of ten require the calculation of the first two rows. The numerical qualifiers for each column are provided by the almanac which leaves only the order of the day names of the row to be calculated. Thus, by knowing simply the natural order of the twenty day names and the groups of four and five represented

|   | A | B | C | D |
|---|---|---|---|---|
| I | MEN | AHAW | CHIKCHAN | OK |
| II | MANIK | EB | KABAN | IK |
| III | KAWAK | KAN | MULUK | IX |
| IV | CHUWEN | KIB | IMIX | KIMI |
| V | AKBAL | LAMAT | BEN | ETZNAB |

Table 6

### Grid Variations

The almanacs, while always preserving the groups of four and five, rarely form a grid like the one in Table 1. In fact, Almanac 46 (page 23B) is the only almanac that does. Instead, each column slightly skews from the last. The grid of numbers containing the four and five interlocked appears to be being manipulated somewhat like a Rubick's Cube, with individual horizontal and vertical sections shifting to create many different patterns of the days. The inclusion of the numbers 1 through 13 make the mathematical variables yet more numerous.

in Table 1, an ancient Day Keeper could realize all of the day names not shown by the almanac with a minimum of mathematical calculations.

### Conclusions

This paper has begun to identify the patterning of the days within the first twenty-three pages of the Dresden Codex. Four groups of five days and five groups of four days have been defined and shown to be interconnected. The groups cycle independently and yet interwoven. Considering that much of the Dresden Codex has been shown to be concerned the cycles of the planets and conjunctions of cycles, it is logical to suggest that the ar-

rangement of the twenty day names used in the first twenty-three pages was created to portray the inter-relationship between the cycles of days on Earth and the cycles of heavenly bodies in ancient Mayan cosmology.

Using the grid from Table 1 and extending the numbers 1 through 13 off of its columns and rows creates a chart into which the location of every prognostication in the first twenty-three pages may be fitted. The result is the "Prognostication Index Chart", explained and displayed on the following pages. There is much more to be known about the true nature the cycles represented by the simple grid created in Table 1. A better understanding of those cycles may lead to an enhanced understanding of Mayan numerology.

## Bibliography

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  1972 *A Commentary on the Dresden Codex.* American Philosophical Society, Philadelphia.
Villacorta, Carlos A., and J. Antonio Villacorta
  1930 *Codices Mayas-Reproducidos y Desarrollados.*Guatemala, C.A.

## Appendix

## Prognostication Index Chart

## Dresden Codex Almanacs: Pages 2-23

How the chart works:

Each of the fifty-two almanacs on pages 1-23 of the Dresden Codex has a vertical column of day names on its far left hand side(some have two columns). These vertical columns number four or five day names. Of the columns that contain five days there are only four possible combinations of the twenty day names. Those four groups of five days are represented in columns A,B,C and D on the chart. Of the columns that contain four days there are only five possible combinations. Those five groups of four days are contained in rows I,II,III,IV and V on the chart. The chart combines these nine vertical column varieties with the numbers 1 through 13. In order to find all the prognostications for any given day simply cross reference it by column and row with its coordinating number. The information given is the locations of prognostications pertaining to the desired day. The almanacs on pages 16-17A and 22-23A are of a special nature and thus have been excluded from this chart. In addition five almanacs have no associated numbers and thus cannot be included in the chart due to lack of information.

**Prognostication Index Chart**

Day-name key:

| | A | B | C | D |
|---|---|---|---|---|
| I | MEN | AHAW | CHIKCHAN | OK |
| II | MANIK | EB | KABAN | IK |
| III | KAWAK | KAN | MULUC | IX |
| IV | CHUWEN | KIB | IMIX | KIMI |
| V | AKBAL | LAMAT | BEN | ETZNAB |

Upper grid (rows I–V × columns 1–13):

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| I | 15B | | | | 23B | | | | | | 19A | | |
| II | 15B | 5C | | 23B | | | | | | 9B | 20A | | 12C |
| III | 15B | | 23B | | | | | 23B | | | 20A | | |
| IV | | | | | 5C | 15B | 23B | | | | 20A | | 12C |
| V | | | | | | 23B | | | | | 19A | 5C | 12C |

Main index (rows 1–13 × columns A–D):

| | A | B | C | D |
|---|---|---|---|---|
| 1 | 2A, 2C, 5B, 6C, 10C, 12B, 9C*, 21B*, 22A* | 2A, 3A | 4B, 12B | 5A, 10C, 12B |
| 2 | 2A, 4B, 18A, 20B, 9C*, 13C*, 21B*, 22A* | 2D, 4B | 9C*, 21B*, 22A* | 13B, 20B, 22C |
| 3 | 4A, 10B, 11C, 22B | 14C*, 15C*, 6A, 8C, 14B, 22B | 9C*, 13C*, 21B*, 22A*, 10C, 22B | 14C*, 15C*, 2C, 4B, 9A, 10C, 11C, 22B |
| 4 | 5B, 8C, 20C | 15C*, 2A, 10A, 17C | 9C*, 7C | 15C*, 7A |
| 5 | 4C, 11B | 2A, 3A, 6C, 10A, 15A | 4B, 11C | 4C, 11C |
| 6 | 10C, 18C | 2B, 5B, 8A, 10C, 13B, 18C, 19B, 9C*, 22A* | 9A, 13B | 4A, 18A |
| 7 | 9C* | 6A | 9C* | 9C*, 22A* |
| 8 | 8B, 10A, 10B, 13A, 15A | 9C*, 21A*, 21B*, 4B, 5A, 14A, 20B, 9C*, 12A*, 21B* | 20C, 22C, 4B, 8B, 11B, 13A, 14A, 16A | 4B, 18A, 23C, 9C*, 21A*, 21B*, 8C, 14A, 18A, 9C*, 12A*, 21B* |
| 9 | 4B, 8A, 20B | 18B | 4C, 8C, 13B | 6A, 19C |
| 10 | 12A* | 13C* | 12A* | 13C* |
| 11 | 3A, 7B, 14B | 6B, 10A | 4A, 7B, 10A | 2C, 3A, 7B, 19B |
| 12 | 21A* | 4B, 7A, 10A, 22C | 21A* | 2B, 4B |
| 13 | 7C, 19C, 9C*, 4A, 4C, 13C*, 21A*, 2D, 3A, 5B, 8C, 18C, 18C, 19C | 4B, 5A, 11B, 22C, 10C, 16B | 8A, 9C*, 6B, 8C, 19A, 13C*, 21A*, 7A, 10B, 10C, 15A, 16B | 4B, 2A, 19B, 23C |

* INDICATES WITHIN GROUPS OF TEN