THE FORM, DATING AND PROBABLE USE OF LANDA'S CHRISTIAN-MAYA YEAR TABLE

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Twenty-two pages of the known partial copy of Landa's *Relación* correlate the 365 «Dominical Letters» of the Christian year with the days of one of the 52 years of the Yucatecan Maya «Calendar Round». From it is derived the equation of the Indian year-beginning day 12 Kan 1 Pop with July 16. This is an important anchor for various correlations of the ancient Maya Long Count, though it is disregarded by others. With A.D. 1553 added to the equation one has a 52-year «yardstick» for Long Count correlation purposes, used by the Spinden and Thompson hypotheses alike. Newcomers to that field may be confused on discovering that there are two schools of thought respecting this dating. One holds that 1553, or the alternatives 1542, 1553 and 1559, may be supplied by the internal evidence of the table itself, while the other holds this to be a fallacy, the conclusion which we shall reach here. It has also been claimed that the relationship of the Christian and Indian elements of the Landa table have been drastically changed by a misunderstanding copyist, so that the correlation as given is spurious.

There is still no consensus on the Maya-Christian calendar

correlation and a review of these conflicting interpretations of an interesting feature of an important portion of Landa's great work seems called for. In respect to the Christian year dating, the question is one of the proper interpretation of Landa's dominical letters A-b-c-d-e-f-g. We will refer to the capitilzation of the initial letter as the marked-«A» style. For reasons to appear, I have borrowed the term «ferial letters» for these. This applies as well to A-B-C-D-E-F-G in «uniform» style. Much that we have to say will seem needless to those who understand the calendar of the Catholic Church, but in these days of freshly printed calendars for each of the years as they come, such an understanding cannot be taken for granted.

The writer, a self-taught layman in such matters, felt himself on solid ground only after constructing various tables and using them to solve calendrical problems. Hence they are given here and the discussion relies on them to a considerable extent. They cover not only a certain amount of variety in church calendars, but also a later «perpetual calendar» scheme which has been claimed to be that of Landa. In the process of examing the function of the Ferial Letters some ideas emerged respecting the purpose and manner of use of the Landa table. We conclude that he intended it as a perpetual calendar in its Indian as well as its Christian aspects, to be read in a cyclical manner.

We first present and discuss selected entries as a rough model of the Landa table because the two English editions of Gates (1937) and Tozzer (1941) do not attempt to give a complete picture. This model, with its headings for five of the six columns used by Landa, is based on a photostat deposited in the Library of the University of Pennsylvania Museum by Paul Shirley. It is a fact, I think, that printed transcriptions of manuscript materials inevitably fail to communicate all minor details, some of which may happen to be important for one unforeseen reason or another. However, our model and most of what is said about it can be checked in the original Spanish-French edition of Brasseur de Bourbourg, 1864, to whom all Mayanists owe so much. Other non-English editions have not been consulted, in view of the voluminous scholarly

annotations of Tozzer. Table 6, for reference, shows where Landa's table places the first of the Maya months in the Christian year.

Arrangement and Announced Purpose of Landa's Table.

The full tabulation is transcribed in Brasseur's edition, but (as noted) not in the English translations of Gates and Tozzer. They give only the month signs coupled with the descriptions of ceremonies pertaining to them and in the case of Gates, the rest of the calendrical entry at firsts of Maya months. Below we represent sixteen selected entries, including the first and the last, to give the reader a picture of the six-column arrangement. This is the «model» previously referred to.

Landa gives the hieroglyphs as well as the names for the twenty days and the 18 months, and these are represented by «G» for «glyph». The capital A's of the ferial letters column are further marked by asterisks to suggest that they may have been taken from a source in which they were also marked by red color. Spanish words are italicized to indicate they have been taken from the photostat, and this convention applies also to substitutions of Spanish for English words in the excerpts from Landa's introductory remarks, which follow immediately. Otherwise, we use the Tozzer translation, using italics for English words for our own emphasis.

«The first day of the year of these people was always on the sixteenth of our month of July, and the first of their month of Pop ... although they begin their year in July, I shall give their *Kalendario* here in no other way than according to the order of our own, to which I shall join it, so that *their letters and ours*, and our months and theirs, may be shown, as well as their count by thirteens mentioned above, *in the order of their numeration.* And as there is no necessity of placing in one place the *calendario* and in another the festivals, I shall place in each of their months their festivals and the observances and ceremonies ... and by this I shall fullfil the promise ... that I would give their calendar *(calendario)* ...».

COMIENZA EL KALENDARIO ROMANO Y YUCATANENSE

IANUARIOS (No heading for wide sixth column for description of monthly Maya festivals, etc.).

	Trezes	*Dias*	*Meses de los indios*	
*A	12	de Ben	G	
b	13	de Ix	G	
c	1	Men	G	
d	2	Cib	G	
e	3	Caban	G	
f	4	Ezanab	G	
g	5	Cauac	G	
*A	6	Ahau	G	
b	7	Imix	G	
f	10	Ben	G	
			Julius	
g	11	Ix	G	
				Pop
*A	12	Kan	G	G
b	13	Ch'an	G	
g	10	Chuen	G	
*A	11	Eb	G	

Note.—The plan to place descriptions of Maya monthly ceremonies opposite the days of the months concerned was realized to a large extent by using blank spaces in the sixth column. 7 Ahau (at 17th of Zac) has a sixth-column note *en qualquier dia que cayesse este septimo de Ahau, hazian una muy gran fiesta que durava tres dias* ... Crowded in the fifth «meses» column at 1 Imix (and 18th of Yax) is *Aqui comiença la cuenta del Kalendario de los Indios, diziendo en su lengua Hun Ymix.*

The five Uayeb days preceding 12 Kan, Pop, are accounted for only by the letters c-d-e-f-g- of Column 1 and a description in Column 6 in which they are called *dias sin nombre.*

The photostat and Brasseur show that Landa does not give the numbered «day of the European month» as stated by Gates

(1931, note on pp. 68-69). These may be recovered, however, by counting the entries in either the first, second, third or fourth column, each of which may be thought of as a chronological «tape measure», with the day as a unit, marked off into larger segments by entries of the Christian month names. In respect to horizontal spacing it is noteworthy that these Christian month names actually cover the Indian calendrical entries of Columns 2-3; 3 only; 3-4; or 4 only. After some ambivalence in this respect, the last arrangement becomes the rule, thus emphasizing the Maya Day Signs which fall within the Christian months. Note also that vertical separating lines emphasize «días» as a heading for this column at the start.

The straight-line or «tape-measure» tabulation continues unbroken except as one of the 22 pages used is filled up. In general, the number of entries per page (16 to 20) is determined by standard-size drawings of the Day Signs. These would have been more difficult to draw at the required smaller scale, if one Christian month had been disposed of on one page of the size used, and less could have said in the sixth column. In spite of the arbitrary page breaks one can count from all Christian month entries except July to a Maya month entry on the same page. Considering also the simultaneous visibility of facing pages, the overlaping of particular Christian and Maya months is well represented visually.

The total of entries is 363 rather than 365 because the scribe omitted two: *c, 12 Muluc* (at June 6) and *c, 2 Chuen* (at November 1). These may be restored, and the table is properly called a 365-day one. Apart from these mere omissions there are no mistakes among the letters in Column 1, though on the ninth page a wrong letter or two seems to have been corrected. On the fifth page, there is a sequence of five mistakes in Day Names or their signs, or both, starting with a correct 6 Ezanab and the sign for Ik., followed by correct 7 Cauac with sign for Ezanab. The two names have been changed in the ms. to agree with the signs, which are in wrong places. No careful check for all copyist's mistakes has been made.

The notation of a movable feast in Column 6 seems out of place, since this column is otherwise devoted entirely to

descriptions of feasts and ceremonies more or less difinitely fixed in the Maya months. Accordingly we are warned by a line connecting the statement to the Day Sign of the 7 Ahau entry, showing the reference is to the 7 Ahau, not to the month Zac in which it happens to lie in the Indian year being tabulated. On this page Column 6 is blank apart from this note, which could have been made as an afterthought and hence not necessarily by Landa.

The same may be said of the notation that a «calendar» began at 1 Imix. Here the departure from plan is more obvius. The note is crowded into Column 5, otherwise kept clean of anything other than month signs and their names, an obviously useful arrangement. One line of the note actually runs across a vertical line marking off Column 5 from the wide Column 6. Tozzer remarks that this note seems out of place, referring to its subject matter, and supposing that the «calendar» involved is the 260-day *tonalamatl* cycle, which we shall here call *Sacred Round*. This cycle was an exceedingly important one in its own right throughout Mesoamerica, and there is outside evidence that it officially began on 1 Imix, and on its equivalent in Mexico. That this is the «calendar» referred to seems confirmed by the position of the note. Accepting this, the notation is in a logical place if one forgets that the column had been reserved for month signs. It could have been made in the sixth column, with connecting line as with the 7 Ahau statement. That it was not tends to increase one's suspicion that it was not in Landa's original table.

Makemson (1946, pp. 28-41) has argued that note was Landa's, but that the entire correlation of Sacred Round days and Indian months with the Christian year is the erroneous product of a later interpreter, who also introduced the textual statement that the Indian year always began on July 16. Involved is the coincidence that the distance from 12 Kan 1 Pop to 1 Imix 18 Yax is 197 days, while 196 days separate January 1 and July 16 in a common Christian year. Makemson's position is that the original manuscript placed the Christian and Indian years side by side, with the start of the Indian year beside that of the Christian year, without intending to correlate them in time. An essential in this argument is the

dating of the ferial letters as applicable to a year beginning with Sunday.

Thompson (1950, pp. 306-307) has, I think, shown that this re-writing of the table as we have it cannot possibly be justified. To his criticisms we have added reason for suspecting the 1 Imix note as Landa's. We may add an item from Column 6 which shows that a Christian-Indian calendar correlation was intended-unless still more re-writing is to be accepted. A festival of Kukulcan is described for the moth Xul, beginning on the 16th and lasting 5 days. In describing another 5-day ceremony in the month Pax, it is likened to the «festival of Kukulcan, in the month Xul, in November» (Tozzer, 1941, pp. 158, 165). The photostat shows no alterations. Our Table 6 shows that, in Landa's correlation of data in Columns 1-5, Xul begins October 24, and therefore the Kukulcan ceremony began November 8, running through November 12. On this evidence alone it is clear that Landa used the term «join» in the sense of «to corelate» the Christian and Indian years.

We shall proceed to examine the «Sunday year» thesis on the assumption that the table is authentic, apart from obvious minor mistakes.

A Latin church calendarium as source of Landa's ferial letters.

In the Roman style of designating the days of the months the first day was called *Kalends*, and in a count-down to it the term appears in about half the designations for the days of each month. In Table 3, I have partially summarized the content of five Catholic *calendariums* in as many prayer books covering a time-spread of about nine hundred years. The two earliest examples are labeled *Kalendarium*, that of 1502 *Calendarium*, the spelling here used for all. They are numbered K1 to K5 for easy reference. Without exception the texts are in Latin, and Roman days of the month are given. We can be sure that the Catholic Bishop of Yucatán had and used such a mass book, presumably with its *Calendarium*. This I think explains his ambivalence in the spelling of that term in Spanish translation (kalendario or calendario), and it explains his label for his table, *Kalendario Romano-Yucatanese*. We can

go a little further. In all five of our sample calendariums we find Latin endings for the first eight month names, but for the last four months we have September, October, November, December, or some variant ending in *er*. In K3 there is also an alternative use of *Septembris, Octubris, Nouembris, Decembris*. I do not understand the distinction, but it is clearly at home in the church calendar, and Landa's spellings correspond, with eight Latin endings and the last four with *er*.

Since all five of our sample calendariums have also the ferial letters, and all but the earliest have the marked-A, we must conclude that Landa's letters come from his Latin church *Calendarium*, and not from some possibly easier scheme for weekday correlation only which (to anticipate) Makemson implies was Landa's. In further confirmation note that in the Calendariums «tape-measure» columns for various sorts of data are to the left, with a wide column to the right for notations of Saint's days and other feast days. All the calendariums are 12-page tables, with one page per month, but we have suggested a good reason for departing from that arrangement in the special-purpose Landa table.

Types and varieties of years in the Indian «Calendar Round».

The «*Calendar Round*» of the Yucatecan Maya and other Mesoamerican Indians results in part from combining their year pattern with a week-like cycle of 20 named days. The Yucatecan names are listed in Table 7c. There is thus produced a cycle of four years distinguisable by varying positions of the named days within the same year pattern. The four differing Day Names appearing in succession at the first days of the year (and of the 20-day months and 5-day period) were called «Year Bearers», which «named» or labeled the four types. Each had its augural values which Landa describes before giving his 365-day table. The four Yucatecan bearers were Kan, Muluc, Ix, and Cauac, and he pictures them separately in that order. Landa calls these «dominical letters» but he surely knew they were Day Names, for elsewhere it is clearly stated that they are a selection from the series of twenty «letters or characters», picturing the complete series from Kan to

Akbal, and says that (referring to the four) «... they use each one of these for one year for the same purpose as we use on our part our dominical letters, so that all (the four) may begin the first days of the months of twenty days». (Tozzer, 1941, pp. 134-135). In the table the day signs are in the column labeled «días».

It is less clear that Landa fully understood the concurrently running week-like cycle of 13 numbered days, though he gives it in Column 2 of his table, *except* for the final 5-day period. Considered separately these produce a 13-year cycle. But since the Day Numbers never stood apart from the Day names we may say they produced 13 varieties of each of the four types founded on the Day Names. We may say more simply that there were 52 types, but we should not forget that this includes varieties of four major types only, and that Landa probably understood the latter only.

There are numerous blank areas in the wide Column 6 which show that the plan was to use this space for descriptions of monthly ceremonies which were spatially more or less opposite the days of the months concerned, as they are reached in the narrow completely filled columns.

There are no numbered days of the month, but for the Christian months these may be recovered by counting ferial letters, and for the Maya months by counting Day Signs, Day Names, or Day Numbers. In his text Landa uses such «month coefficients» with indian as well as Christian months, and when convenient we use them without implying that they actually appear in the table.

The final 5-day «Uayeb» period is not named or provided with a sign, but is described as «days without name», and only the Christian Ferial Letters mark off the five days. However, the notation on Uayeb, which mentions the name, is not opposite these days, as suggested by Brasseur's arrangement (pp. 276); it is well back opposite the last 11 days of Cumku, the last complete month. This was probably merely to have more room to describe Pop, which fills Column 6 of the page starting with the Uayeb days and runs over onto the next page.

In a purely structural sense, what we have said applies to the ancient Calendar Round of the Classic Maya, of the Post-

classic Dresden Codex, and of certain present-day Mayoid and Quichoid Indians of the Guatemala highlands. In those systems the year is a «vague year» of 365 days, never raised to 366 days by a leap day. Landa's Yucatecan year has the leap day and since he is silent on the matter, we shall here assume that he considered it was counted in the Indian year simultaneously with its Christian counterpart, and that at the same time there was double-counting of the Day Number and Day Name-in fact, there is nothing else in his table to double-count, since only the Sacred Round Days indicate the position within the Maya months. It is here suggested that this may have been the fact, resulting from a «freeze» of the complete ancient Calendar Round to the Christian year. I believe a strong case can be presented for such a freeze in Mexico as early as 1533-1536, but there is insufficient space for it here. In Yucatan, the reform was probably decided upon between 1549 and 1552, but not between 1529 and 1532 as has been proposed (see Thompson, 1950, pp. 309, who considers such a reform «almost unthinkable» at either date).

Landa says nothing about a formerly «vague» year, as did Motolinia, in Mexico. The important point here is that a Maya system with leap-days including the Sacred Round, must have been in Landa's mind. Otherwise, with a leap day in the year-count, and not also in the cycle of 20 named days, the «dominical letters» Kan, Muluc, Ix and Cauac would appear at the first days of the months only once every 80 years.

Granting this, one of the four year types would always be a leap year, and if the double-counting was at the same time as in the Christian year, and if one accepts the 1553 for the Kan year, it would be in Cauac years. We may believe that Landa looked upon the Indian year he gave us as one of four types or varieties one of which was raised to leap-year status by rule.

Christian year types and varieties: typical year interpretations of Landa's ferial letters.

Common years and leap years are two types of Christian years, and if weekdays are considered they provide seven varieties of each, or, ignoring the different causes, 14 types.

All seven week days may be the first days or «bearers» of common years and also of leap years. But each of the common year types, such as a common «Sunday year» occurs as the first, second and third common year after a leap year. Thus there are only fourteen types, but they occur in a 28-year cycle. One could call this the «Christian Calendar Round», though I think «Solar Cycle» is the usual term.

Below is a brief summary of the «typical Christian year» interpretations of Landa's ferial letters, as proposed by three editors of Landa (Genet, Gates, Tozzer) and two eminet correlation-proposers (Spinden, Makemson). The basic claim as finally stated by Makemson, is that the marking of the first ferial letter (A) meant that the entire tabulation covered a single Christian year, wihich began on a Sunday. But Genet, Gates and Tozzer went further, so I distinguish two groups, «X» and «Y».

Typical Christian Year Interpretations of Landa's Ferial Letters

X *Spinden* (1924, pp. 85-86): Sunday marked by Capital A, other weekdays by lower case b-g; 12 Kan at July 16.

Y *Genet* (1928-29): not available, but see Tozzer and Makemson.

Y *Gates* (1931, p. 69): succession of church dominicals is A-b-c-d-e-f-g; assigning dominical A to July 16 fixes it at Sunday in 1553; no other Sunday at July 16 between 1525 and 1581; no reference to Genet or Martínez H.

Y *Tozzer* (1941, Note 748 on p. 151): same proposition, quoting with permission a letter of Martínez H. to Genet, dated August 12, 1928.

X *Makemson* (1946, pp. 30-32): marking of A has function ascribed to it by Spinden; the July 16 might have been in 1542, 1553, or 1559; evidence outside Landa calls for 1553, none for the other possibilities; notes «The statement of Martínez Hernández quoted by Gates, Genet and Tozzer ... that 1553 was only year beginning with Sunday between 1525 and 1581 is incorrect...»; gives short extracts from «perpetual year» system of Bond, 1869.

Seemingly Martínez H. should be included in the «typical Christian year» list as the source of the misconception of the «Y» group- i.e. that January 1 (and July 16) appears at

Sunday only once in the 28-year cycle. But in 1932 he describes the church usage of ferial letters correctly, and gives an unmarked series A-B-C-D-E-F-G, and he does not rely on Landa in arriving at his correlation. I suspect that his 1928 letter, with permission to quote, was filed away before 1932 for future use by both Genet and Tozzer, who evidently did not know that Martínez H. had changed his mind.

The common element in the two groups of interpretations is that the marking of *A* made these ferial letters those of a Sunday year, hence a Sunday, July 16th. Though not stated, it must be one of the Sunday common years, since two Sunday letters are applicable in leap years.

Long (1937, p. 97) noted that in the church calendar one always finds A at January 1st and said in effect that this did not make it a Sunday year. He failed to add that if it did, then there should be other typical year tabulations beginning with lower case *a*, and that there are none such in the church system.

Makemson's new contribution was to discover such a system, She says «My own investigation of 16th century calendars convinces me that while Long's statement is correct as far as it goes, Spinden's interpretation must be accepted». She does not cite specific 16th century calendars, noting only the handbook of Bond, 1869. In order to give the reader a more complete idea of the Bond calendar, which is a perpetual one of typical years, it is represented in Tables 4 and 5, together with a similar scheme of Fitch, 1928. To obtain a fair picture of the probable features of Landa's Latin calendarium, Table 3 summarizes five examples covering nearly nine hundred years, as has been noted before. They seem more than a fair sample for our purposes, showing some variety, but great conservatism in fundamentals. Tables 1 and 2 deal with these, and Table 1 also shows the relationships of the typical year labels of Bond and Fitch to each other and to the ferial letters of the church calendarium, as they follow the 28-year cycle in the 16th and also in the 20th century.

Finding weekdays with ferial letters of the Calendarium.

Each of our five sample calendariums is on twelve pages,

one page per month. Table 2 extracts the ferial letters from K1, in uniform (all capitals) style, that used in Martínez H., 1932, in explaining that the church calendar is a «perpetual» one. One column of the Table represents one page of the Calendarium. In the other four examples, the initial ferial letter is marked by using a capital letter, red color, or both, with black lower case letters b-g.

The use of Ferial Letters is sufficiently explained under «Calendar» in the 11th edition of the Encycopaedia Britannica, except that the marking of the initial letter is not used or explained.

A common-sense explanation is that the marked A's when present in the calendarium, mark off the «tape measure» as it passes from page to page, into 7-day segments, counting from January 1st. In Landa's table and in our three earliest calendariums numbered days of the month do not supplement the relatively complicated Roman Calendar designations. The *marking surely in fact makes it easier to supply*, say, «July 16th» by counting in the Ferial Letters column, which is the simplest column In any case, our four marked-A examples confirm that Landa took his letters from a church calendarium.

That calendar is not one of typical years- it serves for any type of year, in connection with rules and perhaps tables not given in the calendarium itself. «Dominical letter» has two shades of meaning for which reason we have used Long's «ferial letters» for what are *potential Sunday* letters in the calendarium itself, though they are plainly labeled dominicals in K5, and were so called by Landa in referring to his table.

The calendarium gives the dates for fixed feasts once and for all. *In the pre-gregorian examples it may or may not be* stated that there is a one day movement of an otherwise fixed feast when the leap day (bissextile) is counted at 6th (before) Kalends of March. With numberd days of the month which we shall use for convenience without necessarily implying their presence in a particular calendarium, this is February 24. If finding the date for Easter and thence other movable feasts is provided for, in addition to the column of ferial

letters there is a column of golden numbers K1, K2, K4) or epacts (K5). With these the official New Moon days are tobe found for any particular numbered «Year of our Lord», as weekdays are to be found with the letters. In both cases auxiliary rules, perhaps with auxiliary tables, are needed; for the weekdays one needs to know the 28-year cycle of true «dominical» or «Sunday» letters, engaged at some point in the count of «A.D.» year numbers.

This sequence, with «epoch» 1900, appears in Table 1b, and comes from the prayer book of Calendarium K5, of about the same date as Bond's *Handbook*, and this tabulation outside the calendarium itself, is also labeled as one of «dominical letters». The marking of the initial letter is in conformity with the ferial letters of the K5 calendarium itself. Note, for example, that the Sunday Letters for 1916 were *bA*, while that for 1917 was *g*. These «dominicals» are all Sunday Letters, for the indicated years respectively. The same cycle appears in Table la, taken from the prayer book of our earliest Kalendarium, but with a different point of departure to obtain 1500 as the epoch. Here the uniform style agrees with the ferial letters of that source, and for 1508 and 1509 we have *BA* and *G*. In the prayer books of our three other calendariums (K1-K3) the cycle of Sunday Letters is not given, but must have been known and used. Such a table is easily constructed if one knows the Sunday Letter of, say, the current numbered year. One must remember to change letters as a leap-day is allowed for at February 24 in the «Old Style» Julian Calendar of Landa.

I think it is clear that marking the initial letter has nothing to do with Sunday Letter status, as noted by Long. When Landa referred to «our letters» he referred to the ferials of his table, which were from his calendarium; when he called Kan, Muluc, Ix and Cauac «dominical letters» the analogy was to the cycle of «dominicals» as Sunday Letters, tied to numbered years. To avoid confusion we are using «ferial» and «Sunday» for these two sorts of «dominicals», and the «28-year cycle» is understood to be that of the Sunday Letters, which are identical with the «Year Letters» of Bond, They do not appear in the calendarium itself. We shall avoid dis-

cussing the interruptions of this cycle caused by the Gregorian reform of 1582, after Landa's time.

The system is exceedingly simple. Let us chose a problem that may have been actually solved in Mexico at about Landa's time. In the *Nahuatl Annals of Tecamachalco* the Sacred Round day 10 Acatl (10 Reed) is fixed at February 19, 1575 (Peñafiel, 1903, p. 59). What was the weekday? Subtracting two 28-year periods shows that its Sunday Letter was the same as that of 1519; reading in Table la we see that for 1519 (and therefore 1575) this letter is B. Turning to Table 2, extracted from the 12 pages of our earliest calendarium, we count down 19 spaces in the February column to obtain A at the 19th of the month. Since the Sunday Letter is B, in this year Ferial Letter A must be the Saturday Letter, so we have February 19, Saturday. Had the initial letters been marked, as in Landa and as in all other calendariums of our sample, the counting to reach the 19th would have been somewhat more rapid. Having reached 5 at the first marked A, we could mentally add 14, dropping to the third Marked-A, at Day 19.

Had the Indian author actually solved this problem, he would have used a calendarium with lower case ferial *b*, and a 28-year cycle of Sunday letters in which *b* was lower case, because in concluding his account of the year he says that the Golden Number was 18, the dominical letter being *b*, in lower case. On disposing of 1576 the Golden Number is given as 19 and the dominical letter is given as *a.g.*, also in lower case (Peñafiel, 1903, pp. 64 and 67). If we changed the initial letters of Table 1b to lower case we would have the cycle as this Indian author was using it. Presumably his calendarium contained «uniform» ferials, all in lower case, instead of all capitals, the latter as in our earliest calendarium. Evidently our sample is too small to show that the uniform style was in use also in the 16th century. Kubler and Gibson suggest annual composition of this Nahuatl document over of a span of years, beginning ca. 1550, when Landa was in Yucatan (1951, p. 55).

Spinden, the apparent founder of the «typical Christian

year» school, made use of these 1575 and 1576 passages, but evidently missed the significance of these lower case Sunday Letters. He merely notes, for 1575, «a statement of the golden number and other calendrical data» (1924, p. 101).

What the Indian chronicler for these two years gives his readers is the auxiliary information needed to use a church calendarium, and accordingly we find «golden number» and «dominical letter» spelled in Latin. With the calendarium itself at hand, if needed, he could have correlated the Sacred Round day 10 Acatl not only with the February 19th which he gives in the body of his text, but with the weekday, saint's day, and the movable feast, if any. Without the calendarium in the background, the given «calendrical data» is meaningless.

We shall avoid discussion of the complete Nahuatl passages for 1575 and 1576 vis-a-vis the correlation problem, except to register agreement with assumptions of Spinden and others that here the Indian calendar was not «frozen» to the Indian year, and to point out that, in that case and as Spinden pointed out, by extrapolation this Sacred Round count placed its equivalent of Yucatecan 12 Kan at July 15, 1553-one day behind the position for it in Landa's typical Maya year, if that began in 1553. Our purpose here has been to show by one among other available examples that 16th century Indians were taught to use the church calendarium, that this one was almost surely without marked ferial letters, and that the Indians were interested in correlating the Christian and Indian system. Thus Makemson's position that Landa did not intend to provide a correlation becomes so much the less tenable (See Makemson, 1946, p. 37); and so does the typical year thesis for Landa's ferial letters.

For the sake of completeness we give a rule for finding the Sunday Letter of a given numbered «A.D.» year, found in the *Brittanica*, in Martínez H. 1932, and probably known to Landa. With it one needs only the boxed Sunday Letter cycle of Table la, which can be constructed if not at hand.

Add constand 9 to year number:	1575 + 9 = 1584.
Divide result by 28:	1584 ÷ 28 gives remainder 16.
Remainder is year number in the 28 year cycle, taking year of Sunday Letters GF as Year 1:	Count 16 inclusively from GF to B.

Our early calendarium (K1) starts the Sunday Letter cycle with GF, and gives no «epoch» corresponding to the 1900 of K5 and Table 1b. The simplicity of the above calculation explains the absence of an epoch in the prayer book of K1, and of the cycle itself in K2-K4. We may say also that Landa, in using his extract from the calendarium, and in comparing Indian «dominical letters» to the Christian ones, had no occasion to spell out the Sunday Letter cycle, That was taken for granted.

The Christian typical year calendars of Bond and Fitch.

Landa's ferial letters in marked-A style (A-b-c-d-e-f). correspond to those in only one of fourteen typical year tables provided by Bond-seven for common years and seven for leap years. The next type, in chronological sequence, shows marked-G (a-b-c-d-e-f-G), the initial letter now being lower case. Because of this Makemson says «I think there can be no doubt that Landa's year began with Sunday, as his dominical letters correspond with the first example». To avoid confusion, we may call Bond's letters *typical year ferial letters* which, like the ferials of the church calendarium, appear in tabulated year tables. The marked letter is the Sunday letter for the year type being used, and the tabulation refers to one complete Christian year of that type. If one wishes to cover parts of two years, he uses parts of two Bond tables.

Fitch's system is identical in basic principle, but he omits the letters, thus proving them unnecessary for finding week days-the function of the ferials of the church calendarium. The typical year tables or «calendars» require labels, and these are made clear in the box of Table 4. With Bond the Sunday letter or letters for a given type becomes the

«year letter» for that type, an apt term since it heads and labels the table. With the year letter Bond associates the name of the first day of the typical year thus identified, i.e., its «year bearer».If there are two year letters, this gives notice that this is the bearer of a leap year. Fitch uses A and B to signify common and leap years respectively, and adds the bearer in numerical form. For example, Type A2 is a common year beginning with the second day of the week i.e. with Monday. For this same type Bond's Year Letter G means that G is the Sunday letter and (what is not so directly indicated) the year begins with Monday.

Both authors provide extensive correlations of the types with the numbered Christian years to which they correspond.

In Table 1 the addition of Tables 1c (Fitch) and 1d (Bond) correlates the types for the 16th and 20th centuries. One reads horizontally to Tables 1b or 1a.

For obtaining the year type Bond also gives the formula noted in Table 4, which seems to make it unnecessary to construct a table of the 28-year cycle of types or to memorize the sequence. The example shows that the rule works for either type of label, finding Type A2, or type of the year letter B, for A.D. 1575. Had we used Table 1a with Tables 1c and 1d we would have reduced the 1575 to 1519, with same Sunday letter B.

In Table 5, we provide the first two months of this year type, in the «tape-measure» style of Bond, with the letters, and also in the 7-columns boxes style of Fitch without them. In either we read «Saturday» directly, for February 19 of 1575. Bond's typical year ferials have no function for this problem.

Confining himself to the year and weekday problem only, Bond gets his fourteen complete typical years on fourteen pages, as does Fitch. Bond also gives one example of a «Roman and church» typical year calendar, evidently a synthetic construction for didactic purposes. It is for the year of Year Letters GF, with two differing sets of golden numbers, the typical year ferials, and named weekdays. It is not properly explained and possibly this led Makemson to infer that this was the system of the church and of Landa.

This one sample «typical church year» requires one page per month, like the actual church calendarium. A full set of such typical year tables, with which to operate, would require 168 pages, and require countless repetitions, including fourteen duplications of the list of fixed feast days.

Bond also gives a correct account of the church calendar ferials, using uniform (all capitals) letters, and noting that this weekday calculating device was instituted in 532. This follows an explanation of his «Year Letters». Presumably those are his own invention.

What then, is their function? In describing the church «Dominicals» he says «The Sundays falling, year after year, to different letters there will be of course, the corresponding changes of letters for the other days of the week to be noticed. And particular attention should be paid to these changes of letters as a practice prevailed for several centuries of giving the letter belonging to the day of the week, in addition to the *guide*, i.e. the saint's day, when an important event was recorded» (Bond, 1869, pp. 27-28).

We can re-cast our 1575 problem which, apparently might have been: «Confirm as correct a recorded Saturday, February 19, 1575, Sunday Letter *b*, Ferial Letter *a*».

We turn at once to Bond's typical calendar under Year Letter B, read Saturday at February 19, and also Ferial Letter *a*. Since the Sunday Letter B is marked, counting back one space from it shows that in the calendarium, used for 1575, Ferial a (or A) was a Saturday Letter, correct for February 19. Since the church system did not and could not mark ferial letters as Sunday letters, it would have been better to mark them in the typical year scheme in some special way or, instead, to have marked the week day name, «SUN.», by capitalization. Nevertheless the Bond letters are useful for the special purpose for which they seem to have been intended.

In the 16th century the friars and the Indians alike were interested in the correlations of much more than weekdays with their respective years. For the modern layman, interested in no more than that, Fitch's 14 pages of as many years are superior to the 12 pages of the calendarium. For a scholar

likewise interested only in week-day correlations with the year, but as they may have been recorded with accompanying Sunday and/or Ferial Letters, Bond's 14 typical years are better. However, the use of the calendarium for finding weekdays is so simple that no churchman who needed to do so for secular purposes can be supposed to have supplemented his church calendarium with a typical year system, with a different principle for marking what look like the ferial letters of his church calendar. Nowhere does Bond seem to have stated plainly that his typical years and Year Letters were his own invention, in the 19th century, but this may be read between the lines in various places.

Cyclical counting in the Calendarium.

All members of the typical Christian year school must consider that if Landa's Ferial Letter A at July 16 is in 1553, his first and last A's are respectively at January 1 and December 31 of 1553. It then results that the first part of the typical Indian Year 12 Kan is properly correlated by Landa with the last part of 1553; but the last part of that Indian year is correlated with proper positions in the Christian year, but those of an incorrect 1553, not 1554. Spinden (1924, p. 86) calls this a «cutting and patching process».

We have concluded that Landa's Christian year is a mere extract from his calendarium, and it is so labeled. It can be used (with auxiliary knowledge of the Sunday Letter) for any particular year; therefore it can be used in a cyclical manner for parts of two adjacent years. For example, I believe the church year always begins on the Sunday nearest November 30. Supposing it began on the first Sunday of December, 1553, and that one wants a list of all the saint's days falling at Sunday in this church year, and their month positions in numbered days the latter as provided for in our sample Calendarium of 1502. Omitting the names of the saints we obtain the dates as follows. After finding the Sunday Letter to be A for 1553, and G for 1554 we turn to Table 2 (representing the calendarium). For 1553, we read A at December 3, 10, 17, 24, 31. Returning to the beginning of the

table (first page of the calendarium), we read G at January 7, 14, 21, 28, and at February 4, 11, 18, 25; and so on to October 28. Where we read A we are in 1553, and where we read G, we are in 1554. We have been reading in the order of the church year, and also in the order of the calendarium, which surely must have been used in this cyclical way. A cycle may be started at any point, not only at some standard beginning point.

This, I suggest, is what Landa meant when he said that he would give «their *Kalendario* here in no other way than according to the order of our own, to which I shall join it...» A reasonably probable preliminary procedure is illustrated in Table 6. Starting in the middle of a work sheet (to allow room for early months) we note *July 16 A, Pop;* count 20 days in the calendarium and enter *August 5, g, Uo,* and so on; the count from *December 23, g, Chen* takes us to the beginning of the calendarium and thence forward to *January 12, e, Yax;* and so on to the end of the Maya year, supplying Uayeb where Landa omitted the name of the 5-day period, at July 11. Five days later we could start another Maya year, *July 16, A, Pop.*

We are now supplied with a complete correlation of the two year structures which, if subject to the same leap year rule, are good for any Christian or any Maya year. In finding the correlation we matched a last part of Christian year X and a first part of the next year Y against one Maya year; but we can read the other way: The correlation holds for all of one Christian year and the last and first parts of two Maya years. In either style it applies to the typical year of Chilam Balam of Tizimin, much later.

We may see some confirmation of assumed cyclical reading in the necesary «cutting» of the month Chen. It's sign appears on the last page of the table. Column 6 is entirely blanck here, and a description of idolmaking could have been placed opposite the 10 days of Chen here indicated. To finish off Chen we must turn back to the first page where, by position, the ceremony belongs in Chen, though the sign itself is not repeated, and the name of the month is not mentioned in the description. The logical place was on the last page

until we note that, by placement on the first page, it is immediately followed, opposite the days of Yax, by description of another ceremony which may fall *either* in Chen or Yax. The idol-making ceremony has been shifted forward (in cyclical reading order) so as to dispose of Chen in one place.

Landa's table and specific correlation Hypotheses.

Landa arrived in Yucatan in 1549, and the ms. copy is dated 1566. Since Landa's table cannot be limited to a specific Christian numbered year, or to a series of them beginning on Sunday, it is perfectly feasible to asign any year from 1549 to 1566, as the value of «Year X» in our Table 6. This will determine the value of «Year Y». Van Suchtelen (1956) chooses 1552 («X») and 1553 («Y»).

Thus he places 12 Kan 1 Pop at Saturday, July 16, 1552, and 12 Ben 11 Chen at Sunday, January 1, 1553. He is in error only in assuming, for the latter equation, that it «is generally and rightly accepted» by the «Mayological sets» who are accused of «stubborn error».

So far as Landa is concerned we may choose 1554 and 1555 for our «X» and «Y» years, with 12 Kan 1 Pop at July 16, 1554. Extrapolating back by 16 years will reach the apparent equation 9 Kan 1 Pop, 1538 in the important *Chronical of Oxkutzcab* (Gates in Morley 1920, pp. 471 and 507).

However, extrapolating from most other early correlations of Yucatecan year bearers with numbered Christian years places the 12 Kan 1 Pop in 1553, where the «typical Christian year» school places it. One suspects a systematic 1-year error in the Oxcutzcab ms. Our purpose has not been to argue against the 1553 dating, but only to show that Landa's table cannot be used in choosing among conflicting bodies of evidence on this point. His contribution, in the table and in his text, is the fixing of the beginning of the Yucatecan Maya year at July 16, and in specifying that a Maya leap day kept it there. This is a very important contribution, whether or not one accepts him as literally correct in all particulars.

Maya Year Bearers and dominical letters.

Granting the introduction of Maya leap-days, the Landa table gives a «perpetual» correlation of the Indian and Christian year structures, and ferial letters for calculating the Christian week-days at any time distance. Column 2 gives positions in the 13-day Maya «week» and Columns 3 and 4 give names and glyphs of the 20 named days, in proper order. These must come from a «typical year», since the sequences repeat respectively in cycles of 13 and 4 years, permuting to form the Calendar Round of 52 years or 73 Sacred Rounds.

Passing by the evidently not understood «count by 13's», the 20 named days were called «letters» and compared with «our» letters, i.e. with the ferial letters, a perpetual calendar device. The four which could be year bearers at 1 Pop were listed separately, and we are told that «they use each one these for one year for the same purpose as we ... use our dominical letters». Thus it is clear that Landa knew his recorded Kan-year sequence of days in the 365-day year was only one of four types, and that the four Maya «letters» were actual day names serving the same purpose as the Christian dominicals. The Maya approach is like that of Bond and Fitch, not like the ferial-and-Sunday letter system of Table 1.

Table 7a-7c is added to show that such letters could have been used to obtain a perpetual calendar including the Maya as well as the Christian named week-days. To illustrate we solve the problem «find the Day Name at 1 Pop in A.D. 1555».

	1555	
Epoch	—1500	«Kan Letter» P (at 1 Pop — Table 1a).
	55	
4—year cycles	— 52	
Year-number	3	«Kan Letter» K (at 11 Pop — Table 7b).

Since in the Maya year beginning in 1555 the «Kan Letter» is K we count back 10 days from Ferial K, always at 11 Pop, from Kan to Ix at 1 Pop.

The Maya certainly had no such system, the function of which is to make one statement of the year pattern suffice, without loosing control over the four varying correlations of the 20 named days with it. Landa's statement that the year bearers Kan-Muluc-Ix-Cauac served the same purpose as the Christian «letters» therefore implies an understood rule for using his recorded sequence beginning with Kan as a standard from which to calculate the other three Day Name types of years. Instead of the «Kan letter» P of Table 7a we would have the Bearer Cauac itself at our chosen epoch, as below.

A.D. 1500 (epoch).

0 Cauac.
1 Kan.
2 Muluc.
3 Ix.

and we would read «Ix» for Year No. 3 directly, as the bearer in 1555.

For the complete sequence of 365 day names the rule would be simple: find the Year Bearer; for Kan years read the correlation of named days with Maya and Christian year positions in the Landa table; taking the Kan sequence of days as standard of comparison advance 5, 10 or 15 days respectively in Muluc, Ix or Cauac years. The cycle of four Year Bearers then serves the same purpose with respect to a Maya «calendarium» as do the dominical (and ferial) letters of the Christian calendarium.

Conclusions.

My general conclusion is that the «Year Letter» system of Bond's perpetual calendar, brought into the picture by Makemson, cannot reasonably be projected back to the 16th century, and in any case the source of Landa's «ferial» dominical letters was the church calendarium, a different perpetual year system. Hence the July 16 and the correlated Yucatecan Maya year bearer 12 Kan at 1 Pop cannot be assigned a Christian year on the basis of the table itself, as

has been supposed by Spinden, Genet, Gates and Tozzer; denied by Long; and re-affirmed by Makemson. Nevertheless, Landa intented to correlate his Christian and Indian date elements in time, though denied by Makemson.

The review of these claims has led to further conclusions of a more general nature. On the Christian side of his equations, Landa's table is and was thought of as that part of his church calendarium necessary for correlating Christian weekdays with Christian dates in any numbered year, or, reading cyclically, in parts of adjacent years. Therefore, he gave no «A.D.» year number for it. On the Indian side he correlated the Indian year structure by entering the month names and signs as they entered on their first days, and gave nearby the Indian feasts associated with the various different Indian months - i. e. Indian fixed feasts. Two «movable» Indian entries are outside the obvious plan, and may be secondary additions, especially the Imix note This months-of-the-Maya-year table (assuming simultaneous leap day counting and as correlated with the Christian Months and Ferial Letters) is also good for any Maya year, or for adjacent parts of two years, with cyclical reading.

The table also correlates the named days of the 20-day Maya «week», but this sequence of positions in the Maya year is valid for only one of four year types, that beginning with Kan. It seems reasonably clear that one was expected to calculate positions of the days in other Maya years using the decribed Kan-Muluc-Ix-Cauac cycle of Year Bearers as pseudo «dominicals», a simpler matter than calculating the correlation of Christian week days with the days of any Christian year by means of Ferial and Sunday letters.

Landa seems not to have realized that his «count by 13's» gave positions in another «week» cycle of numbered days, the «Day Number Bearer» of his typical Maya year being 12. If not, his informant presumably could have supplied the simple rule that the Day Numbers of the table should be increased by 1 for each year after the selected typical year beginning with Day Number 12, casting out 13 on reaching 14. Here we have a cycle of 13 years permuting with one of four years.

The complete table as we have it, with neccesary but simple taken-for-granted calculating rules for both Christian and Maya week days, could have been offered as a useful tool for the Christian friars engaged in trying to substitute Christian for Maya fixed feasts of the Maya year. Both Maya and Christian «calendariums» are «perpetual calendars» in the sense that the year structures are given only once, with described or understood means for calculating week days in any year.

It is suggested that we may safely generalize for Mesoamerica as a whole. Where no numbered year is mentioned for a correlation of the Indian year with the ferial letters, presumably the Indian year is fixed to the Christian one with its own leap day being allowed for in some manner, by rule. The Tovar Calendar is a Mexican example, giving the Indian fixed feasts as does Landa (Kubler and Gibson, 1951). If the days of the 260-day Sacred Round are also correlated, presumably this also was provided with leap days, so as to preserve the ancient Calendar Round pattern, with its movable feasts as well as those fixed in the year. A Mexican example of this is the elaborate calendrical chart of Valades, 1579. According to Kubler and Gibson (1951, p. 55), this dates from not later than 1571, as compared with the apparent 1566 for Landa's manuscript.

In any particular case, of course, the presumption of a «freeze» of the Indian year or of the complete Calendar Round should be tested by all available collateral evidence. In the case of Landa, we are told specifically that at least the Indian year had its leap day. There are those who think he must have been mistaken in this, while we suggest a «freeze» first becoming effective in 1552. Whichever position one takes, it is proper to interprete Landa's table in the light of his understanding, mistaken or not. Similarly with other «frozen» correlations, we may recognize their existence as proposals before being prepared to demonstate that they were actually adopted by the Indians.

It is certain that various Highland Maya Mesoamericans did not accept such a compromise between basically similar

calendrically-controlled esoteric systems. However, considering the tremendous impact of the conquest on the Indians, an *a priori* assumption that no others did so is unjustified. I think this is orthodox enough except that there has been a disinclination to accept evidence for a fixing of the complete Calendar Round, rather than merely its vague year constituent. Landa's table points in that direction for Yucatan.

TABLE 1

Year Numbers for Sunday Letters

Dominical or "Sunday" Letters			Year-types		Notes
1a		1b	1c	1d	
Julian		Gregorian (1900-1999)			
		1900			
		0 Ag*	B1*	AG*	1. ~~Table 1a~~ (Julian Calendar): Add or subtract multiples of 28 years to given epoch (A.D. 1500), without limit.
		1 f	A3	F	
		2 e	A4	E	
		3 d	A5	D	
		4 cb	B6	CB	2. Table 1b (Gregorian Calendar): Add 1st to 3rd multiple of 28 years to given epoch (A.D. 1900), as needed. For 1900 only, Dominical is g (not Ag), Year-type is A2 (not B1), or G (not AG).
		5 A	A1	A	
		6 g	A2	G	
1500		7 f	A3	F	
0	ED	8 ed	B4	ED	3. Table 1c: Cycle of the fourteen year-types as labeled by Fitch (1928, pp. 9-26). Common years A1-A7 and Leap Years B1-B7 begin on Sunday-Saturday in 1-7 order.
1	C	9 c	A6	C	
2	B	10 b	A7	B	
3	A	11 A	A1	A	
4	GF	12 gf	B2	GF	
5	E	13 e	A4	E	
6	D	14 d	A5	D	4. Table 1d: Same, as labeled by Bond (1896, pp. 53-57). The labels are the applicable Dominicals, all capitalized as shown; in the fourteen calendars themselves, only the dominicals are capitalized.
7	C	15 c	A6	C	
8	BA	16 bA	B7	BA	
9	G	17 g	A2	G	
10	F	18 f	A3	F	
11	E	19 e	A4	E	
12	DC	20 dc	B5	DC	5. Table 1a: The boxed all-capital Sunday Letters are from a table following "Calendarium K1" of Table 3 (11th century). The cycle there starts with "GF", and no epoch is given.
13	B	21 b	A7	B	
14	A	22 A	A1	A	
15	G	23 g	A2	G	
16	FE	24 fe	B3	FE	
17	D	25 d	A5	D	
18	C	26 c	A6	C	
19	B	27 b	A7	B	
			--	--	
20	AG		B1	AG	6. Table 1b: The boxed Sunday Letters, with red capital "A's", and the A.D. 1900 epoch for "Ag", are from one of several similar tables covering earlier centuries; they precede "Calendarium K5" of Table 3 (1866). Separate boxes are provided for letters of sequent common years, not indicated here for lack of space.
21	F		A3	F	
22	E		A4	E	
23	D		A5	D	
24	CB		B6	CB	
25	A		A1	A	
26	G		A2	G	
27	F		A3	F	

*See Note 2

TABLE 2

Eleventh Century Set of Ferial Letters

	Ferial Letters												Selected Positions	
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
(1)	A*	D*	D*	G*	B*	E*	G*	C*	F*	A*	D*	F*	(1)	* Roman Kalends
(2)	B	E	E	A	C	F	A	D	G	B	E	G	(2)	
(3)	C	F	F	B	D	G	B	E	A	C	F	A	(3)	
(4)	D	G	G	C	E	A	C	F	B	D	G	B	(4)	
(5)	E*	A*	A	D*	F	B*	D	G*	C*	E	A*	C*	(5)	* Roman Nones
(6)	F	B	B	E	G	C	E	A	D	F	B	D	(6)	
(7)	G	C	C*	F	A*	D	F*	B	E	G*	C	E	(7)	* Roman Nones
(8)	A	D	D	G	B	E	G	C	F	A	D	F	(8)	
(9)	B	E	E	A	C	F	A	D	G	B	E	G	(9)	
(10)	C	F	F	B	D	G	B	E	A	C	F	A	(10)	
(11)	D	G	G	C	E	A	C	F	B	D	G	B	(11)	
(12)	E	A	A	D	F	B	D	G	C	E	A	C	(12)	
(13)	F*	B*	B	E*	G	C*	E	A*	D*	F	B*	D*	(13)	* Roman Ides
(14)	G	C	C	F	A	D	F	B	E	G	C	E	(14)	
(15)	A	D	D*	G	B*	E	G*	C	F	A*	D	F	(15)	* Roman Ides
(16)	B	E	E	A	C	F	A	D	G	B	E	G	(16)	
(17)	C	F	F	B	D	G	B	E	A	C	F	A	(17)	
(18)	D	G	G	C	E	A	C	F	B	D	G	B	(18)	
(19)	E	A	A	D	F	B	D	G	C	E	A	C	(19)	
(20)	F	B	B	E	G	C	E	A	D	F	B	D	(20)	
(21)	G	C	C*	F	A	D	F	B	E	G	C	E	(21)	* Aequinoct
(22)	A	D	D	G	B	E	G	C	F	A	D	F	(22)	
(23)	B	E	E	A	C	F	A	D	G	B	E	G	(23)	
(24)	C	F*	F	B	D	G	B	E	A	C	F	A	(24)	* Locus bissexti
(25)	D	G	G	C	E	A	C	F	B	D	G	B	(25)	
(26)	E	A	A	D	F	B	D	G	C	E	A	C	(26)	
(27)	F	B	B	E	G	C	E	A	D	F	B	D	(27)	
(28)	G	C	C	F	A	D	F	B	E	G	C	E	(28)	
(29)	A		D	G	B	E	G	C	F	A	D	F	(29)	
(30)	B		E	A	C	F	A	D	G	B	E	G	(30)	
(31)	C		F		D		B	E		C		A	(31)	

Note: Each month-name in the box, and the Ferial Letters in its column, are from a separate page of the 12-page Calendarium labeled "K1" in Table 3. Other data, including Golden Numbers, month-day designations in the Roman Calendar, and saint's days are suppressed, apart from starred notes at right.

Ordinary day-of-month numbers in parentheses may be read with any column. They are provided in the two latest Calendariums of Table 3, "K4" (1502) and "K5" (1866).

In Calendariums K2, K3, K4 and K5 Ferial Letters b-g are lower case, A is emphasized by red color, capitalization, or both.

TABLE 3

Contents of Five Calendariums

		Calculation Aids				Feast-dates				
Ref.	Date	Moon?	Ferial A Emphasized?	Locus Bisexti?	Spring Equinox?	Roman Cal. Days of Mo.?	Numbered Days of Mo.?	Fixed Feasts?	Kalendarium or Calendarium?	Source
K1:	11th Cent.	G.Nos.	-	Yes	Yes	Yes	-	Yes	K	Wilson 1896
K2:	ca 1388	G.Nos.	Yes	Yes	-	Yes	-	Yes	K	Legg 1891
K3:	1474	-	Yes	-	-	Yes	-	Yes	-	Lippe 1899
K4:	1502	G.Nos.	Yes	Yes	-	Yes	Yes	Yes	C	Henderson 1874
K5:	1866	Epacts	Yes	Yes	-	Yes	Yes	Yes	-	Anon. 1866

Note: The above summary of contents of five Calendariums omits a set of letters between Golden Numbers and Ferial letters in K1. Calculating aids outside the calendarium appear in the missals of K1 and K5; the cycle of Sunday letters in Table 1b, and its A.D. 1500 epoch, are from the latter. The cycle (all capitals) of Table 1a, but with a start at a year of Sunday Letters GF, and numbered thence from 1 to 28, is given with K1.

Each calendarium uses a separate page for each month. The Ferial Letters of Table 2 (all capitals)are from the 12 pages of K1.

TABLE 4

Bond and Fitch Labels for Christian Typical Calendars, with Julian Calendar (O. S.) Rule

	0	1	2	3	4	5	6	("Remainder 2" per rule)
Common Years	A	G	F	E	D	C	B	(Year-type, Bond)
	Sun	Mon	Tue	Wed	Thu	Fri	Sat	(First weekday of Year)
	A1	A2	A3	A4	A5	A6	A7	(Year-type, Fitch)
Leap-years	AG	GF	FE	ED	DC	CB	BA	(Year-type, Bond)
	Sun	Mon	Tue	Wed	Thu	Fri	Sat	(First day)
	B1	B2	B3	B4	B5	B6	B7	(Year-type, Fitch)

Rule: Divide a given A.D. year number (Y) by 4, obtaining quotient (Q) and a first remainder (Rm1). Note that year is a leap-year if this remainder is zero, otherwise a common year.

Add Q and the constant 5 to Y and divide the sum by 7, obtaining second remainder (Rm 2).

Read year-type labels and name of first day of year in column of table whose number corresponds to Rm2.

Note: Table and rule are based in principle on Bond, pp. 31-32; 186.

Example

$\frac{1575}{4}$ Q = 393
Rm1 = 3 (Cm.Yr.)

$\frac{(1575 + 393 + 5)}{7}$ Rm2 = 6

6
B
Sat
A7

TABLE 5
Beginnings of Bond Typical Year Calendar B and Equivalent Type A7 of Fitch

5a

Year-Type B (Bond)

January			February		
a	1	Sat	d	1	Tue
*B	2	Sun	e	2	Wed
c	3	Mon	f	3	Thur
d	4	Tue	g	4	Fri
e	5	Wed	a	5	Sat
f	6	Thur	*B	6	Sun
g	7	Fri	c	7	Mon
a	8	Sat	d	8	Tue
*B	9	Sun		9	Wed
c	10	Mon	f	10	Thur
d	11	Tue	g	11	Fri
e	12	Wed	a	12	Sat
f	13	Thur	*B	13	Sun
g	14	Fri	c	14	Mon
a	15	Sat	d	15	Tue
*B	16	Sun	e	16	Wed
c	17	Mon	f	17	Thur
d	18	Tue	g	18	Fri
e	19	Wed	a	19	Sat
f	20	Thur	*B	20	Sun
g	21	Fri	c	21	Mon
a	22	Sat	d	22	Tue
*B	23	Sun	e	23	Wed
c	24	Mon	f	24	Thur
d	25	Tue	g	25	Fri
e	26	Wed	a	26	Sat
f	27	Thur	*B	27	Sun
g	28	Fri	c	28	Mon
a	29	Sat			
*B	30	Sun			
c	31	Mon			

5b

Year-Type A7 (Fitch)

January

Sun	Mon	Tue	Wed	Thu	Fri	Sat
						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	29
30	31					

February

		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					

Note:
First two months only of one of 14 year-type calendars are here given as illustrations. Bond's capitalized "Year Letter" has been further emphasized with asterisks in the body of the table. For complete set of calendar-types see Bond, pp. 53-66 and Fitch, pp. 8-26. For a synthetic 12-page Type GF calendar including "Roman and Church Calendar" data see Bond, pp. 78-90.

Example of Use:
Weekday at Feb. 19, 1575 (O.S.)? Find the year-type (Table 1a or Table 4) and turn to its calendar (B or A7). Read Feb. 19, Saturday, in either.

TABLE 6

Correlation of First Days of Maya Months in Landa Table

Christian Year Y							Christian Year X				
p.1 Jan	p.2 Feb	p.3 Mar	p.4 Apr	p.5 May	p.6 Jun	p.7 Jul	p.8 Aug	p.9 Sep	p.10 Oct	p.11 Nov	p.12 Dec
(1 A)	1 d Zac	13 b Mac	2 A Kank.	12 f Pax	1 c Kayab	11 c Uayeb	5 g Uo	14 e Zotz	4 d Zec	13 b Yaxk.	3 A Mol
12 e Yax	21 c Ceh		22 g Muan		21 d Cumk.	16 A Pop	25 f Zip		24 c Xul		23 g Chen
											(31 A)

Note: To save space the tabulation is confined to 1st-of-month stations of the Maya year, implied by Landa's entries of the month names, though without day-of-month numerical "coefficients". Christian civil calendar month "coefficients" are supplied for convenience. Landa uses them in specifying July 16 for beginnings of all Maya years.

To mark the given Maya stations in a calendarium (or in Table 2) start on p. 7 (or column seven of Table 2) at July 16, A, Pop, which may be in any actual Year "X"; on reaching December 23, g, Chen, on p. 12 of the calendarium (or in last column of Table 2) return to p. 1 (or to first column of Table 2), completing the correlation in the following Christian Year "Y".

TABLE 7

Experimental System of Kan Letters and Ferial Letters for the Yucatecan Maya Year

7a		7b				7c	7d			
Kan-Letter Cycle		Maya Calendar "Ferial Letters"				Day Names	"Ferial Letter" Cycle of Landa's Maya "Dominical Letters"*			
1500			Pop	Uo...Uayeb		Kan	Kan	Muluc	Ix	Cauac
						Chicchan				
0	P	(1)	A	A	A	Cimi	P	A	F	K
		(2)	B	B	B	Manik	A	F	K	P
1	A	(3)	C	C	C	Lamat	F	K	P	A
		(4)	D	D	D	Muluc	K	P	A	F
2	F	(5)	E	E	E	Oc				
						Chuen				
3	K	(6)	F	F		Eb				
		(7)	G	G		Ben				
		(8)	H	H		Ix				
		(9)	I	I		Men				
		(10)	J	J		Cib				
						Caban				
		(11)	K	K		Etznab				
		(12)	L	L		Cauac				
		(13)	M	M		Ahau				
		(14)	N	N		Imix				
		(15)	O	O		Ik				
						Akbal				
		(16)	P	P						
		(17)	Q	Q						
		(18)	R	R						
		(19)	S	S						
		(20)	T	T						

*If Kan Letter is A, Muluc is at F, Ix at K, Cauac at P; if Kan letter is F, Muluc is at K, Ix at P and Cauac is at A, etc.

See p. 31 for hypothetical example of use.

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