


THE ANGLO-SAXON COMPUTATION OF HISTORIC TIME IN THE NINTH CENTURY.

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(Continued.)

CHAPTER III. THE CIVIL DAY OR FERIA.

§ i. *The Definition of the Term.*

 HE day on which there was cessation of public and private business in ancient Rome was called *feriae*. This is a plural form with singular meaning, and it is in agreement with that rule of the Latin grammarians which required words denoting a single day, such as *Kalendae*, *Nonae*, *Idūs*, and *Nundinae*, to assume the plural form.^a This rule was still observed in the early part of the third century, and we find Tertullian, who died *ca.* A.D. 217, referring in his *De Jejuniis*, cap. ii., to Wednesday and Friday as *feriae quartae* and *feriae sextae*, respectively.^b In the "Marmor Maffeanum,"^c at *a.d. xvi. Kal. Ianuarias*, we may read—
"G | SAT |

FERIAE,
SATVRN

" wherein G is the ferial letter and indicates the relative place of the Day of the Saturnalia in the nundinal period, or Roman week.

^a Cf. also *octabas*, "the octave"; and *Êastre*, which is always plural in the Chronicles. Plummer, *Glossary*, i., 327; and cf. below, § *ui.*, note *g.*

^b Migne, *Patrologia*, II., col. 956.

^c Cf. *infra*, § *xii.*

§ ii. *The Course of the Feria.*

The Roman civil day, which eventually became known as *feria*, began and ended at midnight.^a It is clear, therefore, that the term *feria* should never be used to denote any day which does not begin and end at the same hour as the Roman *dies civilis*. This rule is not observed, however, and the word *feria* frequently usurps the place of *dies*, the ecclesiastical, or computistical day; cf. § vi., note g, iii. On the other hand, we find *dies* usurping the place of *luna*: cf. St. Ambrose's remark upon the language of the command in Exodus xii., 5—"Et facies Pascha Domino Deo tuo quartodecimo die Mensis primi"—*Diem pro Lunâ dicit.*^b Similarly, and erroneously, Pseudo-Anatolius uses *uigilia* as coincident with and equivalent to *feria*, both being completed at midnight,^c according to him.

§ iii. *The Characteristics of the Feria.*

The reason why *feriae* came to be applied to any day in the week is obscure. Tarquinius Superbus appointed the observance of the *Feriae Latinae* for one day: Livy, I., lv. After the expulsion of the Tarquins the holiday was increased, first to two days, then to three, and lastly, in A.U.C. 388 (=B.C. 366), to four; Livy, VI., xlii. A marked tendency to increase the number of public holidays was evinced throughout the republican period. The loss of public time through holidays at length became so great that the Emperor Claudius abridged their number: Dion., LX., xvii. It is possible that the frequency of festivals and holidays led in time to any day being known by the name of *feriae*.

The *feria*, or civil day, includes portions of two nights. This is

^a "Romani a media nocte ad mediam noctem diem esse existimauerunt"; Censorinus, *De Die Natali*, scr. 238, ed. Hultsch, 1867.

^b "Romani a medio noctis in medium"; Bede, *De Temporum Ratione*, cap. v., apud Migne, tome xc., col. 313 B, and *De Divisionibus Temporum*, cap. viii., *ibid.*, col. 656 B.

^c Vide *supra*, Chap. iii., § iii., note a.

^d Cap. iii., ed. Bucher, *De Doctrina Temporum*, p. 443.

a great disadvantage, for we never know how to describe the first nocturnal portion properly. It is true the moderns say 1 o'clock in the morning of such and such a day, and the like, and the phrase suffices, by convention. But it is known to be quite incorrect during the greater part of the year. For this reason I have recommended the use of the Scottish word "forenight" to distinguish the end of the civil day between dusk and midnight.^a

The correct reduction of Old-English diurnal data depends on our knowledge of the different methods of ferial computation adopted by the computists of the periods comprised under that term. It might be expected that prominent scholars when engaged in chronological speculation would avail themselves of the notes of time that the week-day and the calendar date, when conjoined, so frequently afford. But ferial computation is neglected, and investigators, in some cases, appear to be regardless, and in others, ignorant of the names of the days of the week. *E.g.*, (a) one of the most distinguished of English scholars, when translating an important hagiographical work, has rendered *primâ feriâ* by "on the first holiday," instead of "on Sunday"; (b) St. Wilfrid's biographer and contemporary dated his death *quintâ feriâ*, *i.e.*, "on Thursday"; Mr. Plummer, however, when computing the date of the obit, *v. Bede*, ii., 328, quoted, but disregarded this ferial datum, and inclined to October 12th, 709, which fell on a Saturday, *i.e.*, *septimâ feriâ*; (c) Mr. W. H. Stevenson at one time seemed desirous of abolishing the last-named datum altogether, for in the *Athenæum* of March 19th, 1898, p. 373, col. 2, at foot, he wrote against my "blunder of calling Saturday *septima feriâ*."^b With this dictum of Mr. Steven-

^a *Vide supra*, Chap. iii., § *ui*. The phrase "prima hora noctis" of Bede, "H.E.," II., xii., p. 126, is rendered "wæs foreweard niht" in Alfred's translation. Here *foreweard*, literally rendered, means "first," and it is reflected by the Scottish "forenight," "evening": Glossary to the *Stickit Minister*, by S. R. Crockett, 11th ed. 1895. p. 60, l. 10. The word "forenight" might be adopted with advantage to indicate the period of time between vespers and midnight. Similarly, I would apply the phrase "matutine period" to the hours of darkness falling between midnight and *diluculum*, or dawn.

^b The most curious blunder of all is that of the xviith, xviiith, and earlier sixth centuries in England. The Sabbath, *Sabbatum*, was supposed to be Sunday. I do not refer to illiterate people, who still believe that to be the case, but to scholars. *E.g.*,

son's contrast what the interpolator of Bede's letter to Wicrêd said of Saturday, March 29th, 777 :^e "Secundo anno post hunc [*sc.* post A.D. 776].....septima feria erit luna xiiii^a, IV. Kal. April..." When the term *feria* is used aright it is restricted to civil computation.

¶ The grouping of the *Feriae*.

The *feriae* are grouped into: *a*, the period ending with the *Nundinae*; *b*, the civil week, or *Septimana*; *c*, the Julian calendar month; and *d*, the Julian year.

§ iiiii. The *Nundinal* period, or Roman week.

I have already dealt with the ratio of the *Nundinae*, or ninth day, according to Latin idiom, which is the eighth according to ours; *v. supra*, chap. i., § iii., ¶ b. The *Nundinae*, which word, as I explained just now, is an idiomatic plural with a singular meaning, are connoted in the Roman calendar by one of the letters B, C, D, E, F, G, H.^a The seven days between two *nundinae* are respectively distinguished by any one of the other letters, A to H. It was considered unlucky for the year to begin on a *nundinae*, or for the *nundinae* to coincide with the *Nonae*. Consequently, as the letter A marked the first day of the Roman year, and as the pontiffs were accustomed to intercalate specially to avoid these concurrences, it would seem that the day of the *nundinae* was never connoted by the letter A. The observance of the *Nundinae* was transferred to Sunday by the Emperor Constantine the Great, in A.D. 321. But the connotation in the calendar of the eight

"The [word] Sabbath seems to be used both for Saturday and Sunday. There is in the 'Concordia Regularum,' p. 89, a service for *sabbato sancto* [*i.e.*, Holy Saturday, the Vigil of Easter-Day], and another for *die sancto paschae* [*i.e.*, Easter-day itself]. Yet I would not positively affirm that both the services do not relate to the same day. The translators of the Monastic Rules always render Sabbath by Saturday. *Solvat Oedipus*." See *British Monachism*, by T. D. Fosbrooke, M.A., F.A.S. Lond., 1802, p. 36, note †. Similarly we find Benjamin Thorpe pointing out in a footnote on p. 141 of his edition of Florence of Worcester, "*sabbato*. In 988 *xiv. Kal. Jun.* fell on a Saturday; but, a. 1012 (p. 165), Florence renders 'Saternes-dæg,' by *Sabbatum*."

^e *Vide Patres Ecclesiae Anglicani*, ed. Giles, 1843, I., 163-4.

^a *Cf. infra*, § xii.

days of the Roman week with letters of the alphabet was continued to, at least, A.D. 382^b, and this pagan custom of using a letter to distinguish the same relative day throughout the year has been retained by Christian computists down to the present time. Some makers of calendars, it is true, employed the seven-lettered word "Angelus"^c for this purpose; but the great majority of them used the first group of seven letters in the Roman alphabet.

§ u. *The Civil Week, or Septimana.*

The "septimana," as its name implies, consisted of *septem mana*, i.e., seven mornings (sing. *mane*). The word *mane* is indeclinable in classical Latin. But *septimana*, treated as a feminine noun in the singular number, appears in the Code of Theodosius, which was issued in A.D. 438. The introduction among the Romans of the Egyptian or Jewish week of seven days, took place towards the close of the second century; though Dion Cassius can hardly be quite correct when he says that it prevailed universally in his time, *sc. ca.* A.D. 200.^a Because, first, the celebration of the *nundinae* was not abrogated till the time of Constantine, as we have already observed; and, second, the diurnal lettering of the eight days from *nundinae* to *nundinae* was kept up, as I have already pointed out, till at least A.D. 382; *cf. infra*, § xii.

§ ui. *The names of the Days of the Septimana, i.e., of the Feriae.*

It is believed that Pope Silvester, who was Bishop of Rome from A.D. 314 to 336, published an injunction addressed to the Roman clergy bidding them to avoid calling the days of the week by the names given

^b Vide Mommsen's edition of the *Chronographus anni cccliiii.*, in "Chronica Minora," i., 1892. The style is *annus Passionis*; *cf. Zeitschrift für celtische Philologie*, Bd. vi., 1908, p. 389.

^c E.g., in King Athelstan's Calendar, Cotton MS. *Galba A xviii.*; ed. Hampson, *Antient Calendars*, i., 397-420. In the facsimile, vol. ii., frontispiece, the *a* is minuscule.

^a xxxvii., 18, cited by Adam, *Roman Antiquities*, ed. 9, 1822, p. 303.

to them by contemporary pagans.^a According to Bede, Silvester directed them to call the first day of the week *Dies Dominicus*,^b i.e., the day belonging to the Lord Jesus Christ; to retain the word "*Sabbatum*," because it was used in the Scriptures; and to call each intervening day *feria*, in the singular number, and to distinguish it by its number of position.^c Professor Rühl has doubts about the authenticity of this statement of Bede's^d; but, as we have just now observed, the nundinal week was abolished by Constantine during Silvester's pontificate, and that fact lends support to Bede's statement.

The word *feria* occurs in the singular number as early as c. 375, in the writings of the poet Rufius Festus Avienus, a native of Etruria, and a Roman citizen, who held proconsular offices in A.D. 366 and 372. St. Ambrose of Milan, too, in his *Epistola de Festo Paschali*,^e scr. A.D. 381, uses *feria* in the singular number, and also writes "*dies Sabbati*," "*dies Dominicus*." In the *Origines* of Isidore, Bishop of Seville, who died ca. 640, we are told (V., xxx., 9) that according to ecclesiastical custom ("*ritus ecclesiasticus*"), the days of the week from Monday to Friday were called *feria*, and were distinguished as *secunda*, *tertia*, *quarta*, *quinta*, and *sexta feria*.

According to Dr. Grotefend the phrases *prima feria* and *septima feria* seldom occur in the dates given by continental computists.^f The datum *prima feria* is certainly not so common in insular use as *dies dominicus*. *Septima feria* occurs pretty frequently, however, and both phrases are found in good authors. It must be remembered, also, that

^a "Ferias uero habere clerum primus Papa Sylvester edocuit cui Deo soli uacanti nunquam militiam uel negociationem liceat exercere mundanam, dicente Psalmographo: *Vacate et uidete quoniam ego sum Deus*"; Bede, *De Temporum Ratione*, cap. viii. ap. Migne, xc., col. 330.

^b Cf. "Fui in spiritu in die dominico . . .," St. John, *Revelations* I., 10. Also in the Gospel of St. John xx., 19, 26; Acts xx., 7; and I Corinthians xvi., 2. Contrast Rühl, *Chronologie*, S. 55, nota 1, who thinks it rather doubtful whether St. John's words refer to the first day of the week.

^c See the *De Temporum Ratione*, cap. viii., apud Migne, xc., col. 330.

^d *Chronologie*, S. 58.

^e Vide Bucher, *De Doctrina Temporum*, p. 476.

^f *Zeitrechnung des deutschen Mittelalters und der Neuzeit*, sub voce FERIA, § 59.

the Concurrent Days (*v. infra*, § xi.) are designated by numbers from *i.*, = *prima feria*, Sunday, to *vi.*, = *sexta feria*, or Saturday. This practice is invariable, and it would naturally help to bring into vogue the custom of using the numbers of Saturday, and Sunday, instead of the names of those days. Moreover, an anonymous writer, whose little book, *De Divisionibus Temporum*,⁹ is printed by Migne among the

⁹ Among *Didascalica Spuria et Dubia*, tome xc., col. 657. We may find there: "Feria consuetudine dicitur feriae, enim et scalae, scopae, quadrigae, Thebae, plurali numero fiunt. . . . In eo die primitus dictum est—Fiat lux. Itaque PRIMA FERIA aut prima Sabbati dicatur idem est." In the *De Argumentis Lunae*, *u.s.*, col. 701, in the rule *ad feriam per dies mensis inveniendam* we get *prima feria* for Sunday. Mons. Giry is of the same opinion as Grotefend: "on l'appelait (*sc.* le Dimanche) toujours *dies Dominicus*"; *Manuel de Diplomatique*, p. 134. I append a few instances of the practice of calling Sunday *prima feria*.

i.—741: "Monasterium in Eboraca ciuitate succensum est, ix. Kal. Maii, FERIA PRIMA"; Symeon of Durham, ii., 38.

ii.—"Secundum Sylvestrum Papam PRIMA FERIA dicitur quasi prima dies"; from the *Didascalica* cited at the head of this note. The mistake made with regard to Sylvester does not invalidate the testimony to the use of the phrase "*prima feria*."

iii.—"Obiit Alcuinus xiiii. kal. Iunii, FERIA PRIMA, pentecostes inlucescere die, luna vi., anno incarnationis domini dccciii. indictione xii. anno xxxvi. regnante domno Carolo; accidenti paralyti viii. Idus Maii, feria quinta, ad uesperum post solis occasum, luna xxv." In the *Codex Masciacensis* (of Massai, in the diocese of Bourges) these particulars follow the annal 796, in a hand of equal age, according to Pertz, *M.G. SS.*, tome i., p. 18. In this passage *luna sexta* should be *luna quinta*, and instead of *feria u.*, which did not begin till midnight, *quinta Sabbati* must be read. Alcuin, the most famous Englishman between the Venerable Bede and Alfred the Great, died at daybreak on Whitsunday, May 19th, 804; he had suffered a paralytic stroke on May 8, civil computation, or on May 9, the fifth day of the week (reckoning ecclesiastically), and on the 25th moon. This was Ascension Day in 804, and the calculation of Alcuin's obit presents difficulties similar to those offered by the obit of the Venerable Bede.

iiii.—Cf. "*Feria una*" (a mistaken reading of *feria i^{ma}*), *Introd.* § ii., note *g*.

With respect to *feria septima* the following passages will serve to establish the user:

i.—Cf. *supra*, for Bede's use of the phrase, § iii., text above note *b*;

ii.—We find, in the *De Argumentis Lunae* in the rule *ad feriam per dies anni inueniendam*, *septima*, with *feria* understood;

iii.—"841. vii. kal. Iul. FERIA SEPTIMA, hora quasi secunda factum est proelium in pago Antissiodoro," in *Notae historicae codicibus bibliothecae Sangallensibus adiecta*, "*M.G. SS.*," i., 70;

iiii.—SEPTIMA FERIA is found in the Calendar in the Cotton MS., *Titus D. xxvii.*, fo. 24a; Hampson, *u.s.*, ii., 205;

u.—Mons. Giry (*Manuel*, p. 134) gives an instance, without citing his authority:

treatises falsely attributed to Bede, says—"omnes autem hebdomadae dies feriae dicuntur," *i.e.*, "on the other hand all the days of the week are called *feriae*." For these reasons I consider that the objections raised by Dr. Grotefend, Professor Rühl, and some other scholars who copy these authorities, as to the use of *feria* with the proper numeral to denote Saturday and Sunday, are quite groundless.

Professor Rühl is of the opinion that *feria* ought in all circumstances to denote the working day^h; but he quotes an instance of the use of the phrase "dies feriandus" at as late a date as A.D. 1235, to indicate a day that was to be observed as a holy day.ⁱ He also seems to be unaware of the title of Item x., in the *Argumenta Paschalia*, in the "Liber de Paschate" written by Dionysius Exiguus, in A.D. 525.^k This title runs: "De die septimanae sanctae feriae paschalis," *i.e.*, "Of the day of the week of the holy Easter *feria*." In this passage we must note that *feria* cannot mean the civil, and must, therefore, mean the ecclesiastical day.

The Anglo-Saxon names of the days of the week are as follows :

					Chronicles.
<i>prima feria</i>	...	...	Sunnan-dæg	...	963, <i>A</i> .
<i>secunda feria</i>	...	...	Mōnan-dæg	...	1052, <i>C</i> .
<i>tertia feria</i>	...	...	Tiwes-dæg	...	1052, <i>C</i> (<i>ad finem</i>).
<i>quarta feria</i>	...	...	Wōdnes-dæg	...	1066, <i>C</i> .
<i>quinta feria</i>	...	...	þunres-dæg	...	1053, <i>C</i> .
<i>sexta feria</i>	...	...	Frīge-dæg	...	1106, <i>E</i> .
<i>septima feria</i>	...	...	Sæternes-dæg	...	1012, <i>E</i> .

The ancient Greco-Egyptian week was of seven days. It began on Saturday, and so early as about the year 27 B.C. we find "dies Saturni" used by the Roman poet Tibullus, who is said to have copied

"FERIA SEPTIMA post *Letare Hierusalem*," *i.e.*, after the fourth Sunday in Lent, which has that name and introit.

^h See *Chronologie*, § 58; "Feria soll unter allen Umständen den Werkeltag bezeichnen": "in any case *feria* ought to signify the working day." We must supply "exclusively" here, whereupon it will become clear that Professor Rühl has forgotten that all the days, except the seventh, are, or were, working days.

ⁱ See *u.s.*, § 58, nota 2.

^k V Migne, "*Patrologia*," lxxvii., col. 503, *Argumentum x*.

the Alexandrian poets in his elegies. The order of the planets that dominated the nomenclature of the days of the week is as follows, where the Greek numerals are taken from Dion Cassius, who describes the method of allotment; XXXVII. xviii.¹ α , Saturn; β , Jupiter; γ , Mars; δ , Sol; ϵ , Venus; ζ , Mercury; ξ , Luna. The first hour of Saturday was devoted to Saturn—whence its name. The second to Jove, the third to Mars, the fourth to Sol, the fifth to Venus, the sixth to Mercury, and the seventh to Luna, and so on, from Saturn again. The last hour of Saturday fell to Mars, after which we get *Solis hora* the first of *Dies Solis*, *Sunnan dæg*. That this is correct may be seen by applying the rule: multiply the number of the preceding day by 24, add 1, and divide by 7: the remainder indicates the planet dominating the day. *E.g.*—Monday, *Dies Lunae*, is the third day. Hence—
$$\frac{(24 \times 2) + 1}{7} = 7 \text{ remainder.}$$

The seventh hour was devoted to Luna. Wednesday is the fifth day:
$$\frac{(24 \times 4) + 1}{7} = 6 \text{ remainder.}$$

The sixth hour belonged to Mercury.

The pagan Roman names of the week-days were perpetuated by the Anglo-Saxons,^m with whom “*Sunnan dæg*,” and “*Mōnan dæg*,” are exact renderings of the *Solis Dies*, and *Lunae Dies*, of the Romans under the empire.

“*Tīwes*” = *Martis*; “*Wōdnes*” = *Mercuri* (gen.); “*Þunres*” = *Jovis*; “*Frige*” = *Veneris*; and “*Sæternes*” = *Saturni*.

§ vii. *The Julian and Augustan months.*

The alterations made by the Emperor Augustus in the Roman Calendar were very slight, and no prominent writer, with the exception of Ammianus Marcellinus, a soldier and historian of the fourth century, has attributed the Calendar to him.^a It is generally asserted that

¹ Cf. Rühl, *Chronologie*, SS. 51, 52 and Alexander Neckam, abbot of Cirencester (†1217), *De Naturis Rerum*, cap. x., “R.B. SS.,” No. 34, 1863, p. 46.

^m They are still used by the Welsh who speak their mother tongue: *e.g.*, *Dydd Sŵl*, *D. Llŷn*, *D. Mawrth*, *D. Mercher*, *D. Iau*, *D. Gwener*, and *Dydd Sadwrn*.

^a Ammianus believed that it was Augustus Cæsar who put an end to the pontifical calendar; xxvi., i., 13, ed. Gardthausen, 1874, p. 65.

Julius Cæsar ordered that a twenty-ninth day should be added every four years to the month of February. In so far as the attribution of twenty-eight days to this month in common years, is concerned, the statement is disputed. Julius Cæsar, in his third consulship, A.U.C. 708 = 47, 46 B.C., corrected the confusion of the Roman republican Calendar. By a dictatorial edict he added sixty-seven days to the year and consulship then current, in order to carry the year onward to the day of the new moon next after the winter solstice. The solstice coincided, in those times, with December 25; just as the vernal equinox coincided with March 25, whereas they now fall about three days earlier. Cæsar had decided that the only intercalation should be one day in February, once in each *quadriennium*.^b The year of Rome, 709, for which he was making these dispositions, was to be a leap year (it is equated by 45 B.C.), but it is uncertain how the 366 days allotted to it were grouped.

In Julius Cæsar's time the two months between *Junius* and *September* were called "Quintilis" and "Sextilis" respectively. "Junius," at an early date under the kings, may have been *Quartilis*, and the change may have been made in honour of L. Junius Brutus, just as the change of Quintilis to "Julius" was made by Augustus in honour of C. Julius Cæsar. In the year 8 B.C. the emperor allowed the name of *Sextilis* to be changed to *Augustus* in his own honour.

As this change was made during the lifetime of Augustus, it was thought proper to increase the number of days that Julius Cæsar is supposed to have allotted to *Sextilis*, by one. The reports made by modern computists about these changes are very conflicting. Dr. Butcher, late Bishop of Meath, has shown incidentally that those computists cannot be right who maintain that Julius Cæsar allotted twenty-nine days to the month of February in common years. He points out that if that were correct the intercalation, in order to follow the twenty-third day of the month of thirty days immediately, must have been made at *VII. Kal. Mart.* If it could be proved that Macrobius, who wrote *ca.* 420, was correct when he said that Cæsar

^b Cf. *supra*, *Introd.*, § iii.

did not interfere with the number, viz., $23 + 5$ days, allotted by the pagan pontiffs to Februarius, then the dating of the intercalation would be conclusive. But, as Prof. Rühl says, it does not seem possible to determine the number of days allotted to the several months of the first Julian year. The weight of authority inclines to the number twenty-eight in common years.^c

§ *iiii.* *The Julian Intercalation.*

At a very remote date, it was noticed, at the period of the longest day, that is to say, at the period when the maximum interval of time occurs between sunrise and sunset, that the shadow of the gnomon, at midday, remained of the same length for two or three days. Similar phenomena were observed in winter, at the period of the shortest natural day. These phenomena were accounted for by the supposition that the sun stood still at these particular times. These checks in the apparent course of the sun were eventually recognized as being regularly recurrent. They became known, respectively, as the summer solstice and the winter solstice. They indicated the existence, and helped, also, to determine the position of two other points, severally midway between their own recurrent positions. At these two points the natural day and the night-season were adjudged to be equal in duration. The four positions occupied by the sun in his apparent course through the terrestrial heavens are—the summer solstice, the autumnal equinox, the winter solstice, and the vernal equinox.^d These

^c *E.g.*, "Jules César avait ajouté dans le même intervalle [de quatre ans] un vingt-neuvième jour au mois de février"; the "*Art de Vérifier les Dates*," *Dissertation sur les Dates*, § xi., p. 50. Prof. Rühl, also, *Chronologie*, S. 14, says: "Die Gesichtspunkte, nach welchen Caesar die Tage des Jahres auf die einzelnen Monate verteilte, sind nicht durchweg erkennbar; er gab aber dem Januarius 31 Tage; dem Februarius 28, . . .," and so on. For Dr. Butcher's conclusion *vide The Ecclesiastical Calendar: Its Theory and Construction*, by Samuel Butcher, D.D., Dublin, 1877, p. 17, note.

^d In Anglo-Saxon the solstice and the equinox are called "sunnanstæde" and "erniht," respectively. Prof. Rühl, *u.s.*, S. 16, remarks: "Die Jahrpunkte, d.h. die Zeiten, in denen die Sonne auf ihrer Bahn den Aequator schneidet, oder sich am weitesten von ihm entfernt, welche also die Jahreszeiten begrenzen, legte Caesar nicht genau in Übereinstimmung mit seiner Theorie, aber im Anschluss an das alte italische Bauernjahr, auf *viii. Kal. April.*, *viii. Kal. Quint.*, *viii. Kal. Oct.*, und *viii. Kal. Ian.*," and he refers to Soltau, *Römische Chronologie*, 1889, S. 150.

points in the sun's course are of very great importance, and the ability to fix their position correctly rendered it easy to count the days from solstice to equinox, and from equinox to solstice again. In this way a fairly accurate notion of the course of the revolving year was eventually acquired, and a tabular year was constructed to fit these points.

This year was called the receding year, *annus vagus*, because, owing to the neglect of the six hours' difference between the 365 days allotted to it, and its actual duration, it commenced one day earlier every four years than it should. The ultimate result of this neglect was that, in about fifteen hundred years, the *caput anni*, or first day of this wandering year, had receded through all the seasons. In order to remedy this defect Sosigenes allowed these odd hours to accumulate until they made one whole day, and he intercalated that day at *ante diem VI. Kalendas Martias*, every four years. This day was styled *a.d. bissextum Kal. Mart.*, and the year in which it was intercalated was called "annus bissextilis," or leap-year. In classical Latin the *s* of *bis* is dropped. It is to be remembered that the Church of Rome still intercalates at the same place in the Calendar as the Romans of the Empire did, namely, at the day after the 23rd of February, and not at the 29th of that month.

The Anglo-Saxons called the *Bissextus* "Bises," and their views of the position of the day in the calendar were as follows :

"Bissextō man sceal sȳmle healdan ær þam fif ȳtemestan [dagum] þæs monþes *ond* on þone æftran dæg healde man þone mæssan dæg sē Mathia."

From the inedited eleventh-century computistical treatise in the Cotton codex, *Caligula A. XV.*, fo. 127 vº.

"The *bissextus* is always to be observed before the five last days of the month [of February], and St. Matthias' Day is kept on the day after."

The direction to keep St. Matthias' Day on February 25th, in leap year, is quite clear. The reason for this is that the day that followed the 23rd day of the month was rightly regarded in medieval times as the intercalated day. Hopton, in his *Concordancy*, printed in 1635, quotes the following rhyming couplet :

"Bissextum sextæ Martis tenuere calendæ—

Posteriore die celebrantur festa Mathiæ."

"The sixth calends of March kept the bissextus—on the following day the Feast of Mathias is celebrated."

For earlier times, again, we may refer to the eleventh-century *Leofric Missal*, ed. Warren, p. 21 :

"*Inquirendum est quare dicitur bissexus. Ipse dies dicitur bissexus, duo dies ebdomadis contra unum diem mensis, et contra unum diem lunę, quasi unus dies reputantur; ut est, verbi gratia, VI. Kalendas hodie, VI. Kalendas cras, non primus numeratur sed retro exigitur.*"

The last clause bids us count backwards, and when we do so we say *V. Kal. Mart.*, *VI. Kal. Mart.*, *Bissext Kal. Mart.*, which allots the bissextus to the day after February 23rd. A Cornelius Celsus, who wrote in the reign of Tiberius, *ca.* A.D. 35, says: "... id biduum pro uno die habetur: sed posterior die intercalatur, non prior."^b

Celsus regarded the *biduum* from the point of view of the enumerator, and called that day "posterior," which he counted second; so, too, did the eleventh-century writer quoted above from the *Leofric Missal*. The versifier quoted by Hopton counted the days of the *biduum* in the order of their occurrence in time. In practice, therefore, there was no difference, and it is not necessary to refer to the length of the month of February in republican times, in order to prove that the day intercalated in the classical and medieval periods, must have come between the five days and the 23rd day, which was the last day of the ancient Latin month. Moreover, why should intercalation immediately after February 23rd affect celebration on February 25th, *i.e.*, *V. Kal. Mart.*?

But Dr. Grotefend in his *Taschenbuch der Zeitrechnung*, p. 14, remarks^c:

"Im Februar eines Schaltjahres schiebt sich (unserer Zählung nach) hinter den *VI. Kal. Mart.* ein Schalttag, *bis VI. Kal. Mart.*, ein. Im

^b This is quoted by Eryc Puteanus in his work *De Bissexto*, cap. xii., *apud* Grævius's *Thesaurus Antiquitatum Romanarum*, 1698, tome viii., p. 448, col. 1.

^c In the *Alphabetisches Verzeichniss*, S. 50, he calendars St. Matthias's Day "Febr. 24 (im Schaltjahr meist der 25)."

Mittelalter wird aber bis zum Ende des 15. Jahrh. statt dessen der 24. Febr. als Schalttag betrachtet, und der Matthiastag verschob sich auf den 25. Febr."

The view expressed first would require us to suppose that, at the period Dr. Grotefend had in mind when he was writing, the second day of the *biduum* was regarded as the intercalated one. But he gives no instances of this divergence, and the point upon which his argument seems to turn is the use of the word "posterior," which he renders by *hinter*, and thereby shows that he assumes that it was not the order of enumeration from the Kalends that was implied in that use, but the order of occurrence in time.

The Venerable Bede in his *Historia Ecclesiastica*, II., v., p. 90, dates Ethelbert of Kent's death on the twenty-fourth day of February, 616, and the *Annals of Salzburg*^d, and the *Annals of St. Germain's* at Paris^e, say that Ethelbert died on *feria quarta, VI. Kal. Mart.*, which equates February 24th, 616. But that day did not fall on Wednesday. That year has Sunday Letter D in January and February. This assigns February 22nd to Sunday, and the 24th day of the month to Tuesday. If the obit occurred after vespers on Tuesday, *VI. Kal. Mart.*, it may have been assigned to the following day, and the passage would seem to provide another instance of the incorrect use of *feria*!

There are some old rules entitled *Ratio Cyclorum: Canones*, which are appended in some MSS. to Bede's chronological works,^g and which read thus: "Tribus ergo locis bissextus intercalatur: primo, VI. Idus Februar.; secundo, ubi frequentissime ponitur, VI. Kal. Mart.; tertio, Nonas Mart." If the first and third of these methods were really employed, it would follow that all dates in leap-year from

^d The *Annales Iuvauenses Minores*, ed. Pertz, *Scriptores*, i., p. 87.

^e The *Annales Coenobii Sancti Germani Parisiensis*, ed. Pertz, *Scriptores*, iv., p. 1.

^f The following instances of this incorrect use of *feria* may be cited: Alcuin's obit *supra*, § vi., g. iii.; with the *Historia Abbatum auct. anon.*, p. 400, § 32. "Peruenit autem Lingonas . . . die vii. Kal. Octobr. sexta sabbati." . . . Cf. the *Historia Abbatum, auctore Bede*, § 23, p. 386, "Obiit autem vii. Kal. Octobr. die . . . feriâ sextâ."

^g See Migne *Patrologia*, tome xc., col. 881.

February 7 to March 8, exclusive of both *termini*, are rendered doubtful. But I believe that the Roman monks who were sent into Britain in A.D. 596, by Pope Gregory, regarded the prior day of the *biduum*, in order of occurrence in time, and the posterior day of it, in order of enumeration from the Kalends of March, as the intercalated day.

§ ix. *The Computation of the Bissextus.*

The computistical treatment of the Bissextus (A.S. *bises*) is directly opposed to the early directions of the Church, which prohibited Christians from regarding the *biduum* as one day. It has but one lunar day allotted to it, in order to avoid perturbing the decemnovennial calculation; and both its days are connoted by the same ferial letter, in order to secure the change in the Sunday Letter that is necessitated by the theory of the Concurrent Days. This theory will be explained later; see below § xi. The behaviour of the ferial and Sunday Letters is explained in § xiii.

§ x. *The Julian Calendar.*

The Julian Calendar consists of twelve groups of 31, 30 or 28 days, severally, called months. Four of these, namely, March, October, May and July, have 31 days each, and in all of them the Nones and the Ides fall respectively on the 7th and 15th of the month. The initial letters in these four names are combined to make the memory-word MOMJUL. This, as we have observed already, Chap. i., § iii., should always be kept in mind when computing Latin calendar dates. In all the other months the Nones and the Ides fall, respectively, on the 5th and the 13th. But all the months vary in length in the portion of the month coming after the Ides. The day after the Ides of the MOMJUL group of months is $31 + 1$ (added for the Kalends of the following month) minus 15 (the day on which the Ides fall), i.e., XVII. Kal. of the succeeding month. The other months vary as in the following table, in which there are three months with xix. Kal., four with xviii. Kal.; four with xvii. Kal., and one with xvi. Kal.

A Synopsis of the Julian Calendar.

Nones Ides	5th, 13th,	7th, 15th.	The day after the Ides.			
	Januar.....	xix.....	Kal.	Februar.	= 14.....	January.
	Februar.....	xvi.....	„	Mart.	= 14.....	February.
		Mart.....	xvii....	„	April.	=16 March.
	April.....	xviii.....	„	Mai.	= 14.....	April.
		Mai.....	xvii....	„	Juni.	=16 May.
	Juni.....	xviii.....	„	Juli.	= 14.....	June.
		Juli.....	xvii....	„	August.	=16 July.
	August.....	xix.....	„	Septembr.	= 14.....	August.
	Septembr.....	xviii.....	„	Octobr.	= 14.....	September.
		Octobr.....	xvii....	„	Novembr.	=October.
	Novembr.....	xviii.....	„	Decembr.	= 14.....	November.
	Decembr.....	xix.....	„	Januar.	= 14.....	December.

The names of the Roman calendar months are all adjectives and they agree with *mensis* (masc.) either expressed or understood. They are used attributively with the words *Kalendae*, *Nonae*, *Idūs*, and very rarely appear as possessives in correct Latin writers. For instance, "VII. Idus Maias aestatis initium," *i.e.*, "the 9th day of May is the commencement of summer," Columellas, *de Re Rustica*, XI., ii. In later times it became customary to put the name of the month in the genitive case. The words *Kalendis*, *Nonis*, and *Idibus*, are used as ablatives of time, and the adjective of the month is also put in the ablative. For instance, *Kalendis Ianuariis*, "on the 1st day of January"; *Nonis Februariis*, "on the Nones," that is to say "on the 5th of February"; *Idibus Martiis*, "on the Ides, the 15th of March." When the day stands towards these terms in relationship of numerical order, they are put in the accusative, *ante* being expressed, or understood: as *ante diem tertium Kalendas*. Here the preposition *ante* has, by a corruption of custom, quitted its proper place before *Kalendas* to stand before *diem*, which it does not govern. So entirely idiomatic is this mode of expression that it is used in dependence upon prepositions: "Consul Latinas [ferias] in ante diem tertium Idus Sextilis edixit"; *i.e.*, "the consul proclaimed the Latin holidays for the 11th of August," Livy, XLI., xvi.—"ex ante diem iii. Non. Iun. usque ad pridie Kal. Sept."

i.e., "from the 3rd of June down to the 31st of August," Cicero, *Att.* v. 17.^a Such full style as *ante diem* (or *a.d.*) *xi. Kalendas Februarias* rarely, if ever, occurs in early medieval times, and we most frequently get the simple *xi. Kal. Dec.*, or a phrase of identical construction.

The Venerable Bede's method of calendar-dating for the most part approximates in its main features to that in modern use. Quite half the dates of the calendar in the *Historia Ecclesiastica* have the numeral in the ablative case, and the name of the class in which the day is counted is put in the genitive. Many instances occur which are identical in treatment with the modern method, though not, of course, equivalent to the English idiom. For example: "on the second day before the Kalends of July" is = *tertio die Kalendarum Iuliarum*. The classical form, with the accusative, occurs at least twice: II., iii., p. 86; IV., i., p. 203. The date of Bede's Epistle to Archbishop Egbert (p. 423), viz.—"Nonas Nouembris," is quite irregular. "Prædie" also, occurs at least twice with the accusative: III., xv., p. 157; IV., xxviii., p. 277; and at least five times with the genitive.

The direct enumeration of the days of the month from the first, onward, is found at least six times in Bede: II., v., p. 90; III., ix., p. 145; III., xxvii., p. 191; IV., v., p. 215; V., viii., p. 295; and V., xxiii., p. 350. Mr. Plummer, citing Ideler, *Handbuch*, ii., 191, says that this method of counting the days, which he calls modern, was first introduced by Pope Gregory the Great. But it appears about seventy years earlier than Gregory's time, in the first paschal epistle of Dionysius Exiguus, who, for a definite purpose, calls *a.d. IX. Kal. Aprilium* "uigesimo quarto mensis Martii." Of still earlier times there is a fragment of a Gothic calendar which was written in the fourth century. In this, also, the days of the month are numbered consecutively.^b In the Byzantine Church, the direct method of enumeration was adopted in the seventh century. It appears side by side with the old way in the "Paschal Chronicle." Georgius Syncellus

^a Dr. Kennedy's *Public School Latin Grammar*, Appendix H, pp. 572, 573.

^b *Apud Mai's Scriptorum Veterum Nova Collectio*, V. i., 66, cited by Prebendary Browne, "Dictionary of Christian Antiquities," Article MONTH, p. 1315, col. 2.

in his "Chronography," *scr. circ.* 800, employed only the new reckoning. In England the older method predominated throughout Anglo-Saxon times.

The Anglo-Saxon names of the months.

In the Abingdon (Saxon) Chronicle in the Cotton MS., *Tiberius B. I.*, *scr. circa* A.D. 1050, the annals are preceded by a Menology, or Calendar, written in Anglo-Saxon verse.^c The names of the months are given in the verses, and other names appear in some instances in the margins. I give below the month-names in Latin first, then the Anglo-Saxon forms, according to Bede, "*De Natura Temporum*," cap. xv.,^d and, lastly, according to the Menology aforesaid.

Bede.			Menology.			
			Line.	Verse.		Margin.
Januarius...	Giuli	...	10	Forma mōnað	...	—
Februarius	Solmonath	...	19	Sol mōnað	...	—
Martius ...	Hredmonath	...	36	Hlȳða	...	Hræd mōnað.
Aprilis ...	Eosturmonath...		55	Ēaster mōnað	...	Ēaster mōnað.
Maius ...	Thrimilci	...	79	þrȳmilce	...	þrȳmylce m.
Junius ...	Lida	...	110	ærra Liða	...	Liða mōnað.
Julius ...	Lida	...	132	Iulius (only)	...	—
Augustus...	Weodmonath	...	139	Wēod mōnað	...	—
September	Halgimonth	...	167	Hālig mōnað	...	—
October ...	Winterfylleth	...	183	Winter fylleð	...	Winter filleð.
November	Blotmonath	...	186	Blōt mōnað...	...	—
December	Giuli	...	220	ærra iūla	...	Iūl mōnað.

The order of the months in the Julian Calendar is well known and invariable; but different kinds of years began at different dates, and the order in which the months were counted by those computists whose *caput anni* was not January 1 is necessarily dependent upon the date at which they began. These differences have introduced confusion and

^c *The Saxon Chronicles Parallel*, Appendix A, ed. Plummer, 1892, pp. 273-282, from MS. C, *scr. ca.* 1050.

^d Migne, *Patrologia*, xc., cap. xv., col. 356, Giles, *Patres Ecclesiae Anglicani*, vi.

obscurity into the reports of some early writers, who preferred from time to time to speak of the month by its number of position in the year they employed, instead of by its name. This particular phase of our enquiry will receive attention in Chapter vi., § *iii*.

§ *xi*. *The Concurrent Days.*

In its restricted use, the term "concur" is applied only to the day that falls with March 24th. This date, in the old calendars, is called "Sedes Concurrentium [Dierum]." The ferial letter of *a.d. ix. Kal. April.* is *f*; consequently, when the concurrent day is *i.*, *i.e.*, *prima feria*, *F* is the Sunday letter of the year from March 24th onward. If the concurrent is *ii.*, *i.e.*, *secunda feria* or Monday, *E* is the Sunday letter, because the day before Monday, March 24th, *f*, is a Sunday, and is March 23rd, *e*. Similarly, if the concurrent is *vi.*, *i.e.*, *sexta feria*, Friday (6, 7, 1 = *f*, *g*, *A*), *A* is the Sunday letter, because the second day after Friday, March 24th, *f*, is a Sunday and is March 26th, *a*.

The table linking the Sunday letters with the concurrent days will be found quite easy to remember if we observe that the order is retrograde, and if we memorize the first three letters of it (*sc.*, *F E D*):

Sunday Letters:	...	...	...	<i>F.</i>	<i>E.</i>	<i>D.</i>	<i>C.</i>	<i>B.</i>	<i>A.</i>	<i>G.</i>
Concurrent Days:	...	...	...	<i>i.</i>	<i>ii.</i>	<i>iii.</i>	<i>iiii.</i>	<i>v.</i>	<i>vi.</i>	<i>vii.</i>
<i>Feria</i> of January 1st (common years):	<i>iii.</i>	<i>iiii.</i>	<i>u.</i>	<i>ui.</i>	<i>uui.</i>	<i>i.</i>	<i>ii.</i>			
" " " (leap years):	<i>ii.</i>	<i>iii.</i>	<i>iiii.</i>	<i>u.</i>	<i>ui.</i>	<i>uui.</i>	<i>i.</i>			

Bede gives the rule for computing the concurrent day as follows:^a

"Item. Si uelimus scire adiectiones solis, id est concurrentes septimanae dies, sumere annos Domini, iubet Dionysius, et addita quarta parte, *iiii.* insuper regulares semper adicere docet; quia nimirum *v.* erant concurrentes anno quo natus est Dominus, ut et computandi fixa series procurrare posset, necesse habeat computator *iiii.* quae praecesserunt annectere; ac sic tandem per *vii.* partiri."

^a *De Ratione Temporum*, cap. *xluii.*, *u.s.*, *vi.*, 241.

This rule is perfectly simple : $\frac{\text{A.D.} + \frac{\text{A.D.}}{4} + 4}{7}$ = the number of the

Concurrent Day. Sir Nicholas Harris Nicolas, p. 30, lines 1 to 5, wrongly explains the Concurrent Days and gives no rule for computing them. Dr. Grotefend in *Taschenbuch*, 1898, p. 7, explains the theory of the Concurrent Days correctly, but is equally remiss in omitting to give the rule for finding them. Professor Rühl, *Chronologie*, 1897, p. 145, does give a rule, but it is roundabout and incorrect. He says :—

“ . . . ergibt sich für den abendländischen Sonnenzirkel folgende Regel: man addiert 9 zu der Jahreszahl und dividiert die erhaltene Summe durch 4. Den Quotienten addiert man unter Vernachlässigung des Restes zu der um 9 vermehrten Jahreszahl; dividiert man dann die erhaltene Summe durch 7, so ist der verbleibende Rest die Concurrents. Bleibt kein Rest, so ist die Concurrents = 7.”

If we apply this rule to A.D. 831, we get vii. as the Concurrent, and on turning to Professor Rühl's, p. 142, § 19, we find a table which appears to authorize the assertion that the S.L. connoting vii. is E. But the Concurrent of 831 and the Sunday letter of that year are vi., and A, respectively, and the rule and the table given by Rühl are both erroneous. The reason of the error in the table is quite clear: Professor Rühl has given the Sunday letters in the direct order in which they occur in the alphabet: whereas their true cyclic order is retrograde. As for the supposed rule, that results from confusion of the Byzantine *Annus Mundi* with the A.D., in so far as the computation of the Concurrent Day is concerned.

The rule for changing the number of the Concurrent Day on March 1 has already been given, *v. supra*, Chapter iii., § xii., at the end.^b But this rule was not always observed, and computists frequently changed the number on January 1st.

The rule for computing the number of the Concurrent Day when the year of the Solar Cycle is known is as follows :

^b Similarly in Hampson's 'Calendars,' i., 424, we find the Kalends of March annotated thus : “ Hic mutantur anni lunares et concurrentes.”

"Si uis scire quotus sit concurrens, sume circulum solarem et quartam eiusdem numeri ipsi adicias, partire per septem, et quot remanent totus est concurrens in nono Kal. April."

$$\frac{s.c. + \frac{s.c.}{4}}{7} = \text{the Concurrent Day.}$$

¶ 2. Ferial Computation by means of Letters.

§ xii. *The Ferial or Diurnal Letters.*

At the beginning of the Book of Common Prayer there is printed a Julian calendar showing the immovable feasts and saints' days observed by the Church of England, with one column of alphabetical letters printed in a certain order, and prefixed to the number of the day of the month. These letters are seven in all, and in copies of the Book of Common Prayer they are always printed in a certain way, viz., capital A, then small b, c, d, e, f, g; then capital A again, and so on, group by group, through all the months to the last day of the year, which has the same letter as the first day of the year. All these letters, whether large or small, are ferial or diurnal letters, but the capital A marks the Sundays of the normal or common A-year, and is styled the Sunday letter. In some books on computistics all the letters are printed in capital type.^a This is clearly erroneous, because the Sunday letter only should be printed as in the Book of Common Prayer, in order to assist selection. The use of these letters is this: If January 1st, a, falls with Sunday in a common Julian year, then the ferial letter is written large and capital A marks the Sundays throughout the year. As the common year ends on the same day of the week as it begins upon, the first day of January in the next (common) Julian year falls on Monday. This, of course, has letter a, and the following Sunday, January 7th, g, is connoted by that letter written large, and all the Sundays throughout the year, therefore, are denoted by G. In the second year "a" marks all the Mondays; "b" all the Tuesdays; "c" all the Wednesdays, and so on.

^a E.g., Prof. Rühl's *Chronologie*, SS. 154, 155. Cf. § iii., *supra*, at the end.

In leap years the sequence of both the ferial and the dominical letters is perturbed by the intercalation of one day, next after February 23rd, as the following table will show :—

		S.L. Ferial Moon.					
A.D. 848 February	19	A	i.	xxviii.	ante diem	XI.	Kalendas Martias.
	20	b	ii.	xxix.	"	X.	"
	21	c	iii.	i.	"	IX.	"
	22	d	iiii.	ii.	"	VIII.	"
	23	e	v.	iii.	"	VII.	"
<i>biduum</i>	24	f	vi.	iiii.	"	bisextum	"
	25	<i>g</i> f	vii.	iiii.	"	VI.	"
	26	<i>A</i> G	i.	v.	"	V.	"
	27	<i>b</i> a	ii.	vi.	"	VI.	"
	28	<i>c</i> b	iii.	vii.	"	III.	"
	29	<i>d</i> c	iiii.	viii.	Pridie Kalendas Martias.		
March	1	<i>e</i> d	v.	ix.	Kalendae Martiae.		
	2	<i>f</i> e	vi.	x.	ante diem	VI.	Nonas Martias.
	3	<i>g</i> f	vii.	xi.	"	V.	"
	4	<i>A</i> G	i.	xii.	"	III.	"

In this table the italic letters in the column of Sunday letters are the letters that would follow if the *biduum* were treated as two days, and had two letters given to it instead of one. Those in the second column after the break are the actual letters. If the lettering were continued as in the italic series, the Sunday and the ferial letters would run on for one hundred and twelve years. The device of allotting one letter only to the *biduum* obviates this, and ensures the renewal of the cycle in twenty-eight years.

The method of using letters of the alphabet to indicate the recurrence of the same days of the week throughout the year was derived, as we have already remarked, *supra*, § *iiii.*, by the early Christians from the pagan pontiffs at Rome. At the commencement of some modern editions of Ovid's *Fasti*, the ancient Roman calendar as observed in the Augustan age, is published, after Merkel.^b The

^b Cf. also Bianchini, *De Kalendario et Cyclo Caesaris*, 1703, pp. 6-7, where the calendar is reproduced diplomatically.

authority for this was a marble slab found in A.D. 1547, but since lost, which is spoken of as "Tabula Maffeana." A copy of the inscriptions upon it was made by Stephen Vinando Pighio, a Netherlander studying at Rome from 1548 to 1556, and his copy still exists. The calendar is arranged in columns under the name of each month, and the first vertical line of each column presents a sequence of eight letters of the alphabet, from *A* to *H*, which does not stop with the last day of a month, but is continued right on throughout the year. It commences with *A* and ends with *E*. One of the letters *B* to *H* (except *E*) marked the *nundinae* or *nouendinae* (cf. Chap. i., § iii., *supra*), the market day for the whole year. The incidence of the *nundinae* was interfered with by the superstitions which deprecated coincidence of the Nundines with either the Kalends of January (*A*), or with the Nones (*E*) of that month or of any other. The same method of connotation is found in the calendar drawn up *Anno* [*a Passione Domini*] CCCLIII. = A.D. 382, under Pope Damasus, by Filocalus."

Some modern writers assure us that Dionysius Exiguus indicated the seven days of the Christian week by the seven letters of the alphabet, and that Bede also used them. This may have been so in both cases, but no authority for either statement has been produced, nor is authority known to exist. Professor Rühl, *Chronologie*, S. 68 (at foot) rightly says:

"Die Sonntagsbuchstaben sind bei Dionysius nicht nachweisbar";

but he unadvisedly continues—

"Es ist vollkommen unbekannt wann und wo sie [S. 72] aufgekomen sind: Beda erwähnt sie noch nicht. Sie müssen indessen eine abendländische Erfindung sein, da die Byzantiner nie davon Gebrauch machen."

§ xiii. *The Sunday, or Dominical, Letters and their Cycle.*

In common Julian years January 1 and December 31, as we have observed already, in the last section, are connoted by the same ferial letter, and the year, therefore, is found to begin and end on the same

^a Cf. *supra*, § iii., d.

weekday. If a common year begins on a Friday that day of the week is connoted by "a," throughout the year. The second day of the year is marked by "b," and the third, which in this particular instance is a Sunday, having letter "c," indicates the Sunday letter of the year, namely C. The year we are considering ends on a Friday and the connotation of the *feriae* of the next common year recommences with "a, January 1, Saturday," and January 2 having letter "b," and falling on Sunday, the letter B is the Sunday letter of the year. This second year ends on a Saturday, and the next year we will assume to be a common year, also. Its ferial connotation recommences, therefore, with "a, January 1, Sunday," and the Sunday letter of the third year must consequently be A. These three years then have Sunday letters C, B, A, and the movement of these letters throughout the cycle is always retrograde. The next year after three common Julian years must be a leap-year, and, as the third common year of the group we have selected ends on Sunday, the leap-year commences with "a, January 1, Monday." Sunday, in this year, being the seventh day of the year, has the seventh letter of the alphabet, and the Sunday letter if the course of the ferial letters were not perturbed by the day intercalated at February 24 (= *bissext. Kal. Mart.*), would therefore be G, throughout the year. But owing to the intercalation the course of the letters is as follows:—

February	18	19	20	21	22	23	24	25	26	27	28	29, etc.
	G	a	b	c	d	e	f	F	g	a	b	c „

With this compare the table printed above in § x. The leap-year, therefore, which we are considering, has two Sunday letters, namely, G and F, and all other leap-years have two letters likewise.

The leap-year that has Sunday letters G and F is the first year of the so-called Solar Cycle of 28 years, which is variously styled from its different members—the Cycle of the Dominical, or, Sunday letters; the Cycle of the Concurrent Days; and the Cycle of the Ferial letters. The leap-years run 1, 5, 9, 13, 17, 21, 25 (29 = 1). The Sunday letters of these years can easily be borne in mind by learning them in pairs in the reverse order in which the pairs severally occur. Thus:—FG, AB, CD, EF, GA, BC, DE, (FG = 1). When the literal

connotation of any leap-year has been counted, care must be taken, before applying it, to reverse the alphabetical order to the correct retrograde position. For instance—What is the Sunday letter of a year that has Cyclic number 20? The nearest leap-year is (5, 9, 13, 17), 21; the pairs of Sunday letters are (AB, CD, EF, GA), BC; the retrograde and correct order is CB, and these are the Sunday letters of year 21; therefore the Sunday Letter of year 20 is D.

The following table gives the relative order of the different members of the Cycle.

THE SOLAR CYCLE.

Year Number.	Feriae of Kal. Januar.	Sunday Letters.	Concurrent Days : ferial letter March 24, f.
1	... <i>f.ii.</i>	GF	... <i>f.i.</i>
2	... <i>f.iii.</i>	E	... <i>f.ii.</i>
3	... <i>f.v.</i>	D	... <i>f.iii.</i>
4	... <i>f.vi.</i>	C	... <i>f.iiii.</i>
5	... <i>f.vii.</i>	BA	... <i>f.ui.</i>
6	... <i>f.ii.</i>	G	... <i>f.iii.</i>
7	... <i>f.iii.</i>	F	... <i>f.i.</i>
8	... <i>f.iiii.</i>	E	... <i>f.ii.</i>
9	... <i>f.v.</i>	DC	... <i>f.iii.</i>
10	... <i>f.vii.</i>	B	... <i>f.u.</i>
11	... <i>f.i.</i>	A	... <i>f.ui.</i>
12	... <i>f.ii.</i>	G	... <i>f.iii.</i>
13	... <i>f.iii.</i>	FE	... <i>f.ii.</i>
14	... <i>f.v.</i>	D	... <i>f.iii.</i>
15	... <i>f.vi.</i>	C	... <i>f.iiii.</i>
16	... <i>f.vii.</i>	B	... <i>f.u.</i>
17	... <i>f.i.</i>	AG	... <i>f.iii.</i>
18	... <i>f.iii.</i>	F	... <i>f.i.</i>
19	... <i>f.iiii.</i>	E	... <i>f.ii.</i>
20	... <i>f.v.</i>	D	... <i>f.iii.</i>
21	... <i>f.vi.</i>	CB	... <i>f.u.</i>
22	... <i>f.i.</i>	A	... <i>f.ui.</i>
23	... <i>f.ii.</i>	G	... <i>f.iii.</i>
24	... <i>f.iii.</i>	F	... <i>f.i.</i>
25	... <i>f.iiii.</i>	ED	... <i>f.iii.</i>
26	... <i>f.vi.</i>	C	... <i>f.iiii.</i>
27	... <i>f.vii.</i>	B	... <i>f.u.</i>
28	... <i>f.i.</i>	A	... <i>f.ui.</i>

Various opinions have been advanced to account for the selection of a GF year as the first of the series. Rühl, *Chronologie*, S. 68, says, "Wahrscheinlich ist der offizielle Anfang mit dem Jahre 328 n. Chr. gemacht worden, als dem nächsten Schaltjahr nach dem Concil von Nikaea, auf dem die definitiven Festsetzungen über das Datum des Osterfestes getroffen wurden und das zugleich mit den Vicennalien Constantins zusammenfiel." (Dr. Rühl here gives a reference to Scaliger, *De Emendatione Temporum*, 1628, p. 359, 507.)

Another suggestion is that Dionysius Exiguus, who wrote his *Paschal Epistle I.* in 526, Sunday letter D, Concurrent iii., chose A.D. 524 for year 1 because that was the nearest leap-year. These, I think, are merely chronological coincidences. The reason why GF was chosen to head the cycle of the Dominical letters, would appear to be inherent in the nature of the connexion between the latter and the Concurrent Days. In the first place, the letter is an occidental invention which was not used by either the Greek or the Oriental Churches; therefore, the linking of the Cycle of the Sunday letters with the Cycle of the Concurrent Days, which is Greek in origin, must have been carried out in the interests of occidental computation. Now, on the one hand, as the Cycle of the Sunday letters comprises seven cycles of four years each, it is obvious that these smaller groups must either begin or end with a leap-year. Any other way of forming this group would entail the necessity of both the cycle and the sub-cycle commencing in the middle of one period of four years, and ending in the middle of another, which is obviously improper. On the other hand, the Oriental Cycle of the Concurrent Days commences on March 24, f, and necessarily on a Sunday, inasmuch as it naturally commences with Concurrent 1, i.e., *prima feria*. The year that is the *nexus* of the two Cycles must therefore be connoted in one by Sunday letter F, and in the other by Concurrent 1. Inspection of the table given above will make it quite clear that the only years that have Sunday letter F, in March, are 1, 7, 18 and 24, and that it is only the first of these that does not present the objection of beginning in one four years' cycle and ending in another, a proceeding which we have already agreed to regard as improper. This year 1, GF, therefore

responds to all the conditions we can impose, and it was selected for that very reason.

The linking of the twin cycles of 28 years to the era of the Incarnation was brought about by inspection. If we have a leap-year to date we can do so accurately within 27 years; consequently, there was no difficulty in determining the place in the Cycle of Sunday letters of A.D. 8, S.L. AG, the first year in the Christian era in which the Julian intercalation was effected; *Chap. i., § iii.*

