

Reply to Lichtenberg

The Gregorian Calendar and the Calendar Reformed by Kinoshita

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I have read with much interest the article by Dr. Lichtenberg on the Gregorian calendar.¹ In the last issue of this journal,² I mentioned that the calendar reformed by Kinoshita is more suitable than the Gregorian calendar for use in the era after the 20th century. Against my opinion, Lichtenberg mentioned that the Gregorian calendar is an adaptable cyclic "lunisolar" time-reckoning system for the millennia, and that there is no need to reform the Gregorian calendar as it now stands. In this paper, I would like to mention the reason why I believe that Kinoshita calendar is more suitable for use in the era after the 20th century.

The first large cycle of 400 years including corrected common years 1700, 1800, and 1900 in the Gregorian calendar has been terminated. For the period of 400 years, the deviation in date of the vernal equinox in the calendar has been satisfactorily corrected. The year 2000 is a leap year, namely, is not a corrected common year. The second large cycle of 400 years in the Gregorian calendar is just going to start. On such an occasion, it seems important that we consider carefully whether or not the Gregorian calendar continues to be suitable for use in the era after this century. Discussion on this matter including Lichtenberg's opinion and my opinion should be made by many investigators. The year 2000 is a chance that occurs once in a thousand years.

In Kinoshita calendar, when the century number is indivisible by 5, the year $20 \times$ its remainder in that century is a corrected common year. Namely, in the 21st, 22nd, 23rd, and 24th centuries, the years 20, 40, 60, and 80, respectively, are not leap years, whereas in the 20th and 25th centuries, such correction is not performed.

(1) The rule to decide the dates of corrected common years in Kinoshita calendar is clear and simple in the same degree as in the Gregorian calendar.

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(2) In all leap years of Kinoshita calendar, the deviation in time of vernal equinox from that in the preceding corrected common year is not beyond about 1.06 days, i.e. a period only slightly longer than 1.0 day. On the contrary, in the Gregorian Calendar, this deviation in the leap year 2096 from the preceding corrected common year 1900 is about 1.53 days ; namely, that is greatly longer than 1.0 day because the year 2000 is not a corrected common year. Thus, in the period between 1900 and 2100, there are four dates of vernal equinox in Japan, namely, March 22, 21, 20 and 19.

(3) In Kinoshita calendar, the difference between the length of solar year (365.2422 days) and the mean length of the year in the large cycle of 500 years (365.2420 days) is 0.0002 day. That is considerably smaller than the difference of 0.0003 day in the large cycle of 400 years in the Gregorian calendar. This indicates that the period in which the sum of differences amounts to 1 day is about 5000 years in Kinoshita calendar, whereas that period is about 3300 years in the Gregorian calendar.

(4) Actually, the above period seems still longer in Kinoshita calendar than in the Gregorian calendar, because the length of the solar year that is expressed in days decreases gradually in such a long time. In the Gregorian calendar, accordingly, the actual value of this period seems to be about 2600 years. On the contrary, in Kinoshita calendar, this actual period seems to be about 10000 years. This indicates that in the Gregorian calendar, the next reform will be necessary in the year after about 2600 years from now, whereas, in Kinoshita calendar, it is hardly necessary to taking the next reform in consideration.

(5) The calendar will shift from the Gregorian calendar to Kinoshita calendar in a smooth manner. Namely, the period between the preceding corrected common year 1900 in the Gregorian calendar and the first corrected common year 2020 in Kinoshita calendar is 120 years, which is the same as the period between the year 2020 and the second corrected common year 2140 in Kinoshita calendar.

(6) In Kinoshita calendar, every century contains just 2 large cycles of 500 years. Mankind uses the decimal system. In Kinoshita calendar, accordingly, the date of the corrected common year can be calculated simply, only using the last digit of the cen-

tury number. On the other hand, in the Gregorian calendar, the large cycle is 400 years, and the date of the corrected common year must be calculated, using the first two digits of the year number.

(7) In the present time, the Gregorian calendar is used widely by people in the world, not only by Christians but also by Buddhists, communists and persons without religion. Therefore, I believe that calculation of the date of Easter is not a primary problem in the calendar.

(8) I think that even if the calendar is reformed to Kinoshita calendar, the date of Easter will be calculated according to the dates of March 21, full moon and Sunday in the reformed calendar.

(9) In some churches, Easter has been celebrated in a fixed date.³ In 1928, the British parliament passed the Easter act, which, contingent upon its acceptance internationally, fixed Easter day as the first Sunday after the second Saturday in April, falling between April 9 and 15. In a certain church belonging to the United Church of Christ in Japan, Easter day has been fixed as the first Sunday in April.

(10) Mankind gains the greater part of food from agricultural products, which are influenced closely by changes of seasons. Thus it seems important that the deviation in date of vernal equinox in the calendar is as small as possible. As mentioned above, between the years 1900 and 2100 in the Gregorian calendar, there are four dates of the vernal equinox in Japan, namely, March 22, 21, 20, and 19.

Again, I would like to mention that whether or not the Gregorian calendar continues to be suitable for use in the era after the 20th century, discussion on this matter including my opinion and Dr. Lichtenberg's opinion should be made by many investigators. The year 2000 is a chance that occurs once in a thousand years.

References

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2. Kinoshita S. Is the Gregorian calendar suitable for use in the era after the 20th

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グレゴリ暦と「キノシタ」暦

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前回、提案した「キノシタ」暦が、グレゴリ暦に優っている理由は、次のようである。(1)「キノシタ」暦の規則は、グレゴリ暦と同様に、単純明快である。(2) グレゴリ暦では、1900年と2100年の間に、春分の日付が4日もある。「キノシタ」暦では、うるう年における春分の時刻のずれは、常に、ほぼ1日以内におさまる。(3) グレゴリ暦では、約2600年後に、春分の時刻の狂いが、さらに1日加わり、暦の再改正をせざるを得ない。「キノシタ」暦では、このような1日の狂いが生じるのは、1万年も先のことで、再改正をほとんど考慮する必要がない。(4)「キノシタ」暦では、1つの世紀の中に、500年の周期がちょうど2つ入る。人間は、10(2×5)進法を用いているので、400年の周期をもつ、グレゴリ暦に比べ、暦の算出法が容易である。(5) 現在、グレゴリ暦は、単にキリスト教徒だけでなく、世界中の人々によって、広く用いられている。従って、復活祭の日付の算出は、暦の主要な役目ではない。(6) 現在、日本キリスト教団の教会の中で、4月の第一日曜日に、復活祭を祝っているところもある。(7) 人類は、食料の大きな部分を農産物から得ている。農産物は、季節の変動に密接に影響を受ける。従って、春分の日付の変動が、できるだけ、小さいことが良いと思われる。

「キノシタ暦」は、単純明快な算出規則を持ち、精度が高く、かつ、永続的な暦である。2000年の時点で、考え得る、最も良い暦であると信ずる。

キーワード：グレゴリ暦、「キノシタ暦」、春分、復活祭