

COMMENTARY

The Law of Calendar Reform: We Got Rid of Year 2020, But Why Stop There?

BY TIMOTHY G. NELSON

When the year 2020 ended, it was met with almost unprecedented derision. “Good Riddance, 2020,” was a common refrain. Netflix’s end-of-year comedy retrospective was titled “Death to 2020.” The Washington Post even convened a panel of historians to debate whether 2020 was the “Worst Year Ever.”

The expiry of the “*Annus Horribilus*,” of course, merely marks the completion of a numbered calendar year. And a calendar in turn, is a complex (and in some respects convoluted) system for organizing and measuring time. Although we tend to think of the calendar, with its 12 month, 365 day (and leap year) system, as a constant, the reality is that it is a human construct—the product of laws and conventions. For Americans, the present calendar system is the product of colonial laws that were enacted in the mid-18th century. Conceivably, Congress and/or state legislatures could alter those laws (and thus alter the calendar) should they see fit. Indeed, not too long ago, there was a spirited attempt to do persuade Congress of the virtues of calendar “reform” (or “simplification”), rearranging our 12 irregularly-spaced months in favor of a more streamlined,

business friendly system. The calendar is more malleable than might be thought.

The Components Of the Calendar

The “calendar” is a system for organizing time—both time already elapsed, and time yet to elapse. Today’s calendar is an amalgam of five different concepts:

Days. The day is the length of time for the Earth to rotate.

The “Calendar Year.” Although a “year” is considered a constant, the “calendar year” varies from 365 days in a normal calendar year and 366 days in a leap year. As all schoolchildren are taught, the reason for this variation is that the actual amount of time Earth to complete its orbit (the “tropical year”) is approximately 365.24 days—hence the addition of a “leap day,” usually every four years, in order to correct for this. Specifically, a “leap day” is inserted every four years *except* in a year marking a century (hence, the year 1900 had no leap day), with the further proviso that for a century year that is divisible by 400, there *will* be a leap day. Hence, the year 2000 *did* have a leap day.

Despite this quirk, the concept of a year is so elemental (indeed, primal), and so seemingly easy to observe, that



all time units, including the base unit of one second, were once calibrated according to the length of a “tropical year” (using the length of the year 1900 as the base)

Anno Domini. The numbering of our years is based on the assumption that Jesus Christ was born on Year 1, originated midway through the first millennium, with the blessing of the Church. This accounts for the suffix “A.D.,” meaning *Anno Domini*—“the year of our Lord” – covering years post-dating that event, and “B.C.” (“Before Christ”) for years preceding it. In recent years, some have begun the suffixes “C.E.” (“common era”) and B.C.E. (“before common era”) to avoid the religious connotations associated with the more traditional “A.D.” and “B.C.”

Months. Our system of having 12 months dates back to the Classical

era. It was first standardized under the Roman Empire under what was called “Julian Calendar,” after Julius Caesar. The Roman origins are evident not only in the Latin names of many of the months (e.g., September, October), but also from the fact that two of the months, July and August, are named after members of the Julio-Claudian dynasty (Julius and August Caesar, respectively). The calendar “month” is itself not a scientific concept, but it has vestigial links to the lunar month (the length of time for the Moon to orbit the Earth).

Weeks. Our seven-day week is an even more ancient tradition; it is prescribed for example, in the Ten Commandments and the era of Moses. It is a stand-alone concept with no mathematical connection either to a year or a month.

The Legal Basis for The Calendar

Our calendar system may derive from tradition but it has a firm statutory basis, tracing back to colonial times.

As noted above, the traditional “Julian” calendar was the product of Roman Empire regulation, which in turn, was continued in European history (including through the general influence of the Catholic Church). In the 16th century, however, Europeans realized that the Julian calendar had slightly overestimated the length of any one year, with the result that, over the centuries, the earth’s equinoxes and solstices had slipped behind their proper places in the calendar by approximately 10 days. Consequently, in 1582, Pope Gregory XIII issued a papal bull mandating the adoption of a new calendar (the “Gregorian calendar”) that corrected the 10-day drift and slightly reduced the number of leap years going forward.

Although the Gregorian Calendar was immediately adopted in Catholic countries such as France and Spain, it was only adopted by Britain in 1750. Under the Calendar (New Styles) Act enacted that year, which applied “in and throughout all his Majesty’s dominions and countries in Europe, Asia, Africa, and America”—thus extending to the original American colonies—the Act adopted the Gregorian calendar as and from 1752 (and directed that the period Sept. 2, 1752 through Sept. 14, 1752 be skipped, in order to correct the Julian drift). As a pre-colonial law of general application, the Calendar (New

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Styles) Act continued in force in the United States—and had some real-world implications (e.g., although, by statute, George Washington’s birthday has been celebrated on February 22 each year, he was actually born on Feb. 11, 1731 under the old calendar).

By the end of the 20th century, most countries had given up on the Julian calendar, and the Gregorian calendar (along with Western numbering of years) for secular purposes was all but ubiquitous. (A relatively late convert was Russia, which only switched after the revolution of 1917.) At the present date, the Gregorian calendar (and Western numbering) is standard in virtually all countries, and is utilized by the International Bureau of Weights and Measures in administering Coordinated Universal Time, the time scale that forms the basis for the coordinated dissemination of standard frequencies and time signals.”

“Calendar Reform” Movements: From the French Resolution to George Eastman

Pope Gregory, however, did not have the last word on calendar reform. The polyglot nature of the calendar—whose weeks and months are wholly unsynchronized—as well as its stubborn non-decimal numbering (seven days a week) and uneven months, have led to periodic calls for rationalization.

A dramatic (indeed notorious) attempt at calendar reform was made during the French Revolution. The Republican calendar abolished the 7-day week in favor of 10-day weeks, and created an entirely different series of months. Under the reformed system, the years ran afresh from the date of the Resolution (Year I = 1792), and months were given new names, beginning with “Vendémiaire” (on what was once September 22) and running through to “Fructidor” (occupying what was once late August/early September). Each month was 30 days long, and was divided into three 10-day weeks (confusingly called “decades”). The spare days would be collected and gathered as a series of festivals at the end of the year.

This was all too much for most people. After he was made Emperor, Napoleon abolished the Republican calendar and restored the Gregorian calendar. (Ironically, however, Napoleon Bonaparte’s 1799 coup d’état is still remembered as “18 Brumaire,” because it occurred on 18 Brumaire, Year VII under the Republican calendar (Nov. 9, 1789 under the Gregorian calendar).)

The next serious attempt at calendar reform came more than a century later, with an attempt to adopt a 13-month year, with equal months and synchronized weeks. This began

when the Pan American Conference (the precursor to the Organization of American States) met in Havana, Cuba in 1928, and enacted a resolution calling for the League of Nations to convene a general conference on “simplification of the calendar.” In urging this, the Pan American Conference noted the anomalies in the current calendar such as “[i]nequality in the length of the divisions of the year” (e.g., January is longer than February), and that “the position of the weeks in the quarters varies each year; that is to say, the weeks overlap the divisions of a year in a different way each time, and complications accordingly arise in the reckoning of accounts, statistics, and so forth.”

The Havana resolution, which was apparently warmly supported by the U.S. delegates, prompted Representative Stephen Porter (then Chair of the Foreign Relations Committee) to propose legislation to allow for an American delegation to attend a forthcoming League of Nations conference to consider the matter. At the ensuing House Committee hearings of 1928 and 1929, “calendar reform” received a rapturous enforcement from industrialist George Eastman, the chairman of a national “Committee on Calendar Simplification.”

Eastman and his allies claimed that, although the “inconveniences” of the existing calendar had been tolerated because of “custom and tradition,” there was a compelling business case for a year based on thirteen equal months. Under this plan, a new summer month (called “Sol”) would be inserted between June and July, resulting in 13 months of 28 days’ length, with every single month beginning on Sunday the 1st, and each one ending on Saturday the 28th, as follows:

The advantage of this system lies in its fixity: The third day of every month would always be a Tuesday; each month would have the exact same number of working days. But the obvious mathematical challenge is that it creates a 364-day year (13 times 28), leaving a 1.25-day shortfall each year. The reformers proposed to deal with this by adding an extra (or “blank”) day to the last (13th) month (which they would call a “Peace Day,” or an extra “Sabbath”), as well as retaining a leap day every four years (but repositioning it from February to mid-year, and also treating it as a blank day).

Effectively, therefore, the Eastman plan would involve periodic interruptions to the cycle of a seven-day week; a cycle has been repeating itself for (literally) time immemorial. As even Eastman’s camp conceded, this plan was radical; it represented a “comprehensive change in long-established customs.” Another drawback noted by the proponents of the Eastman Calendar was that “[s]uperstitious regard for Friday the 13th, occurring every month, is difficult to overcome.” As indicated in the above table, Friday the 13th would be a recurring feature of a reformed 13-month calendar.

Not surprisingly, Congress did not endorse it, with the result that the United States was without official representation at the League of Nations conference that met in Geneva in 1931 to discuss the issue.

Despite strong continued advocacy from Latin American delegates at that conference for calendar reform, the conference failed to produce any consensus or agreed pathway forward. A further push was made in 1937, when the Chilean government raised the matter at the Council of the League of Nations, but the matter was shelved.

“Calendar Reform” And Vatican II

After World War II, efforts were made by various governments to promote calendar reform within the United Nations, again without success. In addition to the 13-month model, a 12-month perpetual “World Calendar” was advocated: this would have 91 days “in a rotating pattern of 31, 30, and 30 days.” “The day after December 30 was designated World Day and not assigned a weekday status or number; another such day was tacked on after June 30 in leap years.”

By the 1960s, however, opposition to calendar reform had coalesced, including among religious groups. In 1962, as part of the Second Vatican Ecumenical Council (“Vatican II”), Pope Paul VI announced that although the Church “does not oppose efforts designed to introduce a perpetual calendar into civil society,” it had reservations about any system that would interrupt the even day week:

[A]mong the various systems which are being suggested to stabilize a perpetual calendar and to introduce it into civil life, the Church has no objection only in the case of those systems which retain and safeguard a seven-day week with Sunday, without the introduction of any days outside the week, so that the succession of weeks may be left intact, unless there is question of the most serious reasons. Concerning these the Apostolic See shall judge.

This pronouncement—coming as it does from one of the world’s most influential bodies (not to mention the original author of the Gregorian calendar)—represented a major setback for calendar reform, and may well account for the relative lack of reform advocacy since 1962. The Eastman Calendar, however, retained at least one small core of

adherents: it remained in use at Eastman's Rochester operations long after Mr. Eastman's death in 1932, and its use at the plant was only discontinued in 1988.

Other Reforms To Our System of Time

While the calendar has resisted calls for reform, other elements of time remain in flux. Within the United States, time zones are primarily regulated by Congress through the Universal Time Act (which also has prescribed daylight saving time) and embraces UTC ("Coordinated Universal Time") as prescribed by the General Conference on Weights and Measures. Time zones, however, are susceptible to change—as most recently witnessed by the 2005 amendments that extended daylight saving time in the United States. Even more radically (and despite the seemingly preemptive nature of the Uniform Time Act), there are periodic calls at the state level for individual states to move their time zones. For example, a 2019 initiative by a New York state legislator proposed to abandon daylight saving and re-align New York with the Canadian maritime provinces (which are on Atlantic time). The bill's stated "justification" was that

"[t]he seasonal switch back and forth from daylight saving time causes productivity losses and leads to an increased risk of car accidents, health complications, and other damaging consequences. This switch is compounded by New York's position in the Eastern Standard Time Zone. If the state switched to Atlantic Standard Time, sunsets would be an hour later each day, a change would be especially helpful in the winter, when the sun would no longer set before 5pm."

Moreover, every now and again, countries have been known to flout Universal Time. In 1997 (in advance of the new millennium), for example, the Pacific state of Kiribati announced that some of its islands would be placed 14 hours ahead of Greenwich Mean Time. Even though this created a 2-hour bulge in the International Date Line, it attracted little sanction.

Finally, the base unit of the "second" itself has itself changed. As noted above, until 1967, "seconds" were measured by referenced to the amount of time it took for Earth to orbit the Sun (the "tropical year"). Yet the Earth's transit around the sun can vary, due to the gravitational pull of planets and other factors, thus leading the BIPM to abandon this standard. Moreover, many other standards for measuring time, such as an ordinary pendulum clock, are subject to the vicissitudes of gravity—for example a pendulum stationed at altitude will swing slightly differently than a pendulum at sea level. Thus, in 1967, the BIPM agreed that "an atomic standard of time, based on a transition between two energy levels of an atom or a molecule," provided the most precise means of measuring a second. It adopted a definition of the second "referenced to the frequency of the ground state hyperfine transition in the cesium 133 atom." And in 2019, this definition was refined further. A second is now defined as "equal to the duration of 9 192 631 770 periods of the radiation corresponding to the transition between the two hyperfine levels of the unperturbed ground state of the ¹³³Cs atom." (<https://www.bipm.org/metrology/time-frequency/units.html>.) Even in the last two years, therefore, the way we measure time has materially changed.

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George Eastman's and Elizabeth Acheilis's dogged campaigns for "calendar reform" are a case study in futility, as is the French Revolutionary model of the 1790s. Whatever the aesthetic or economic merits of having a "perpetual" calendar, most people would surely resist changes to a cycle that, in the popular mind, has continued since time immemorial. However keen we may be as "adopters" of new technologies, the basics of how we count our days, weeks and years are unlikely to be altered in the foreseeable future. Even so, the recent tweaks to our base measurement of the second are a small but significant reminder that our calendar is a human construct—a product of laws and regulations—and, as such, intrinsically susceptible to change.

TIMOTHY G. NELSON *is a partner at Skadden, Arps, Slate, Meagher & Flom.*