Calendar Time, Cultural Sensibilities, and Strategies of Persuasion

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In considering the relationship of time, globalisation, and international relations, time cannot be viewed as an abstract, uniform yardstick that merely provides a chronological organisation of events. Instead, there is a close relationship between cultural ideas of time and political sensibilities. There are many elements to this connection that one could explore, but here I shall limit myself to the relationship between calendars, holidays, and styles of persuasion. To do this, I shall discuss the tensions generated from the global distribution of Western timekeeping; describe the values latent in the secular holidays of the United States, the United Kingdom, and People's Republic of China; and show the relationship between the values celebrated in calendars and the rhetorical strategies used by these nations in two very different international debates: climate change and the leap second.

There are relatively few political debates about concepts of time. Yet, there are few ideas that pervade almost everything to the same extent as temporal ideas. The value of money and securities is influenced by trading protocols in which the sequence of trades is documented by means of synchronised timestamps. Getting directions from a Global Positioning System (GPS) involves relying on a suite of satellites that are basically orbiting clocks transmitting time signals. National security relies on the analysis of big data sets in which precise timestamps are crucial to understanding the sequence and pattern of events.

Anthropologists are interested in how concepts of time are related to the exercising of power and the structuring of political and social action (Rutz 1992; Greenhouse 1996). Public consciousness of this fact is probably not as great now as it was in the past when heads of state controlled calendars and state defined holidays and thereby controlled the rhythms and celebrations in people's lives (see Stern 2012). Until the seventeenth century, many European chronologies referred to the reigns of monarchs (Wilcox 1987), and many civilisations—China, the Maya, Rome—involved explicit links between those who defined time and the ruling elite.

The currently dominant system of clock and calendar time emerged in association with European imperialism, and it gained its current distribution as a result of colonialism and global trade (Bartky 2007; Birth 2012; Quinn 2012). Capitalism has been shaped by the logic of fixed terms and timed transactions and wages have been defined in terms of units of time rather than directly in terms of the ideal timing for most the most productive work. The time grid, established by the Gregorian calendar and clock time, is also a tool in bookkeeping—time becomes represented as containers to be filled and/or audited. Modern governance would be quite different without the relationships among global units of time, management, and bookkeeping, particularly since these units of time are used as a means of control and discipline. In late June 2015, there was a confrontation between the International Monetary Fund (IMF) and Greece over a debt repayment due 1 July 2015. The head of the IMF, Christine Lagarde, stated unequivocally that the 1 July deadline was non-negotiable. There is no solar, lunar, astronomical, or biological cycle that defines 1

July, however. Its reality is due to cultural convention, but that cultural convention is a political tool.

The European Cultural Logic behind the Global Time System

This time system now reaches into the structure and design of computer systems. Everything a computer does receives a timestamp, and commands are often executed in a sequence based on these timestamps. Timestamps are globally synchronised to Coordinated Universal Time (UTC)—a timescale maintained by the International Bureau of Weights and Measures (BIPM). The BIPM determines UTC using measurements received from atomic clocks distributed across the globe. As a result, the definition and distribution of time has reached unprecedented levels of precision and accuracy.

It must be pointed out, however, that the emphasis on hyper precision is the result of a cultural, not a global, choice. Unlike timekeeping in other parts of the world, European timekeeping came to emphasise the use of uniform units of duration divorced from observable astronomical cycles to represent time (Birth 2012). This temporal logic is embedded in European-style clocks (Borst 1993; Dohrn-van Rossum 1996; Landes 1983), the default form of clock found in the world today. Other cultures have had other logics. Jewish zmanim and Christian canonical hours are defined in terms of seasonally variable hours that served as points in time rather than as set durations. Edo period Japanese clocks divided the day into six daylight and six nighttime seasonally variable hours, and they created clocks to represent these seasonal variations. Chinese timekeeping and Hindu jyotish (astrology) are anchored to the interaction of celestial cycles. European timekeeping privileges uniform oscillations for defining time over the irregular rotational behaviour of Earth.

The Global Distribution of Western Time Concepts

The current use of Western time standards across the globe was not the result of an election or national leaders signing a treaty. It is a Western scientific preference riding on the coattails of colonialism (see Barak 2013). The fixed and uniform nature of time metrology makes it appear as if it is apolitical, yet decisions such as where to place the prime meridian for timekeeping purposes were hotly contested (see Barrows 2011), and there continue to be global debates about the definition of time, such as the leap second debate that is discussed later.

The far reach of Western time technology and Western time logics creates peculiarities in the world. GPS was developed as a United States military technology. It consists of clocks mounted on satellites that emit time signals. GPS is now critical to the functioning of all sorts of software applications, including those used to indicate Islamic prayer times and the direction of Mecca from any position on the globe on mobile devices. Somewhere, a member of ISIS is using a Muslim prayer application for this purpose—his/her devotion is achievable with great precision in timing and orientation because of the assistance of the US military's navigation satellites. In effect, even the sworn enemies of the US employ US military technology to know time and place.

Adaptation versus Adoption

While GPS and precision time technology might be viewed as being of great benefit to all of humanity, GPS time represents the imposed Western time. Much of the world has figured out how to adapt itself to Western clock and calendar time, but for many, it is an adaptation, not an adoption. In some parts of the world, the Gregorian calendar is associated with a religion (Christianity) and colonising nations towards which there is antipathy.

To get a sense of adaptation rather than adoption, try to place a special holiday in a different calendar. Here, I shall use the example of Christmas. Its date is determined by the Gregorian calendar—it is always December 25. But if the Gregorian calendar was not dominant, then Christmas would appear differently in calendars.

For the sake of imagination, let us conceive that the dominant calendar was the Islamic calendar, and that Christmas

would need to be determined first using the Gregorian calendar, and then placed within the Islamic calendar. This situation is already what many people throughout the world have to do—indeed, there are more Hindus, Chinese, Jews, and Muslims adapting their holy days to a Gregorian rubric than Westerners for whom the Gregorian calendar represents their heritage. To place Christmas in a non-Gregorian calendar would involve using algorithms such as those in Dershowtiz and Reingold's *Calendrical Calculations* (1997). Such algorithms are now commonplace in applications that take computer dates and times that are in a Gregorian and UTC format and convert them into religiously significant times for Jews, Hindus, and Muslims.

Placing Christmas in the Islamic calendar faces an additional complication however—there is no single, globally agreed-upon Islamic calendar. This emerges from a debate about whether the beginning of the lunar month can be predicted or can only be announced after the new moon is observed. It is also complicated by the debate over whether it is the local sighting of the moon that is important, or the appearance of the moon in Mecca. Important Muslim holy days, like the month of Ramadan, can begin on different days for different Muslims depending on which calendrical authorities they follow. As a result, any attempt to relate Christmas to an Islamic calendar also involves a *political* choice of which Islamic calendrical method to use—a choice that brings with it an implicit privileging of one source of Islamic calendrical authority over others.

Once the problem of placing Christmas in the Islamic calendar has been resolved, there is another question of what to do when Christmas occurs during Ramadan, the Muslim month of fasting. This happens because the Islamic year consists of 12 lunar months and is about 11-12 days shorter than the solar year that forms the basis of the Gregorian calendar. As a result, holidays in the Gregorian and Islamic calendars drift in relation to one another. The last time Christmas was held during Ramadan would have been the period from approximately 1419-1421 in the Islamic chronology (1998-2000 in the Christian chronology).

Adaptation and Conflict

It does not take much imagination, then, to realise the extent to which calendrical differences can highlight differences in a globalised world. The domination of the Gregorian calendar and Western clock time allows those who know no other calendar or clock to avoid seeing the calendrical conflicts. Indeed, Western clock and calendar time come to be viewed as natural and beyond question. With increased contact between people of different cultural traditions, conflicts can occur along with entrenched misunderstandings.

For instance, a few years ago, a temporary instructor at my institution complained bitterly about the Jewish High Holy Days. She wanted to give an exam on one of those days and did not want to excuse Jewish students from the exam. Her argument was that since the university was a secular institution it used a secular calendar and should not recognise religious holidays. Because such clashes have been a problem in the past, the university has adopted a policy that such students are entitled to take the exam on another day. The commonly held Gregorian calendar does not eliminate difference—it merely elides it. Conflicts occur, sometimes with unhappy results. While my department forced the instructor to comply with university guidelines, this did not make the instructor very happy, and she continued to express resentment towards the Jewish students in question.

This type of situation is not new. While it seems to have little bearing on modern globalisation, I shall use the example of medieval European Judaism to briefly explore how antagonism gets intermingled with calendars. The choice of this example is that the time that has passed since this case makes it easier to discuss than some current events, but the lessons that can be learned are still relevant. Many medieval European Jewish populations recorded the days of Christian saints in their calendars. At a functional level, this makes sense. Stern (n.d.) points out that markets and fairs were tied to Christian saints' days and that this information would have been useful to Jewish traders. He also suggests that dating official documents would have also benefited from knowledge of saints' days. After all, many of the commercial cycles were directly tied to the liturgical calendar, such as the British banking cycle that defined the quarterly periods with reference to Trinity Sunday and Michaelmas.

While Jewish calendars made reference to saints' days, this was not a sign of collegial ecumenicalism between Jews

and Christians in the Middle Ages. Anti-Semitism and persecution of Jews by Christians in the Middle Ages are well documented, and Jewish sentiments about Christianity are expressed in their calendars. Stern (n.d.) has described the anti-Christian rhetoric found in them. For instance, in several calendars, the Hebrew spelling of the word 'saints' can be read *qedeshim*, which means 'prostitutes' (Stern n.d., 14, 28). In another example, Stern studies a North French calendar from 1278 which begins with the statement 'these are the months of the non-Jews and their abominations' (Stern n.d., 4).

Holidays and Cultural Sentiments

The annual cycle of holidays reveals cultural sentiments. One can look at the secular holidays adopted by different nations and quickly ascertain different emphases on the sorts of events and people commemorated (Callahan 2006). One can also look at school curricula and often see these emphases reflected in education. But what is most disconcerting is to look at national policies and see how the logics that guide the holidays and the schooling shape policy arguments. In thinking about time and politics, it is not merely a matter of how Western time reckoning has been imposed on the globe, but how the sentiments reflected in the holidays shape how global events and conflicts are discussed. There is a striking correspondence between the values embodied in holidays, and the types of arguments and evidence policy makers use in staking out their positions. In drawing this connection, my point is less to identify policy differences than to highlight differences in the sorts of arguments and evidence thought to be persuasive, but which might, in fact, be unpersuasive across cultural differences.

The national secular holidays in the United States are: Martin Luther King Jr. Day, President's Day, Memorial Day, Independence Day, Labor Day, Columbus Day, Veteran's Day, and Christmas. New Year's is left off of this list because of its religious origins within the British Empire and its former colonies—it was the Feast of the Circumcision whereas 25 March was the beginning of the new year until 1752. Among the secular American holidays, four directly refer to war: Presidents' Day, Memorial Day, Independence Day, and Veterans' Day. Two refer to martyrs for social causes: Martin Luther King Jr. Day and Labor Day. Christmas's history is actually tied to war since it was moved to November by Abraham Lincoln during the Civil War in order to celebrate what he perceived as the turning point in the conflict. Moreover, many people, particularly Native Americans, associate Christmas and Columbus Day with the killing of America's indigenous population. In effect, every single secular holiday in the United States has an association with a war, an armed conflict, or people being killed.

In contrast, the United Kingdom's secular holidays are known as bank holidays. These holidays include Spring Bank Holiday, Late Summer Bank Holiday, and Boxing Day. The Spring Bank Holiday replaced the religious holiday Whit Monday. Whit Monday's date varied because its timing was tied to Easter. Now, The Spring Bank Holiday falls on the last Monday in May regardless of when Easter occurs. Boxing Day does not celebrate banking, but it does emphasise social stratification. If one looks for themes in British secular holidays, they are banking and social stratification.

In the People's Republic of China, secular holidays come in two varieties. One set of holidays celebrates the traditional holidays of the Chinese calendar. As a result, these holidays shift from one year to the next in the Gregorian calendar. Several holidays within the traditional calendar have clear religious connotations, such as Chinese New Year's Day and the Qingming Festival. Others, such as the Duanwu Festival (Dragon Boat Festival) and the Mid-Autumn Festival emphasise astronomical events: the summer sun and the harvest moon, respectively. As such, they are associated with food, feasting and agriculture. China also has three holidays tied to the Gregorian calendar: New Year's Day, Labour Day, and National Day. National Day not only celebrates Chinese Nationalism, but Chinese industry and economic development, as well. There is a twofold theme in the holidays of the People's Republic of China, then: traditional time reckoning, and an emphasis on labour, agriculture, industry, and economic development.

Holidays indicate important cultural sentiments. The sentiments reflected in national holidays also manifest in styles of persuasion—an uncanny and sometimes unsettling relationship between how time is structured and celebrated and how nations participate in global debates. To demonstrate this, I shall focus on two sets of governmental statements of policy positions: climate change and the leap second.

Time, Cultural Sentiments, and Climate Change Rhetoric

Of these two policy debates, the issue of climate change is well known. While one normally thinks of this debate as framed in scientific terms, one can see cultural differences in the approach to the climate change issue in the key documents released by the United States, the United Kingdom, and the People's Republic of China. All three nations are very concerned about climate change, but the ways in which the concerns are stated is quite different from one another.

The key document in stating the US position is the report *Climate Change Impacts in the United States* (Melillo et al., 2014). This is an 841-page report in which something is described as being killed or dying approximately every 10 pages. In addition, whereas most of the report addresses how climate change will affect food production, the conclusion emphasises the need to understand how climate change will affect the military. The fascination with death and the military is consistent with the sentiments cultivated by American holidays. Moreover, the second most important document about climate change is the 2014 US Department of Defense's *Climate Change Adaptation Roadmap* (2014). In fact, President Obama often cites this document generated by the military rather than the more thorough *Climate Change Impacts*. American holidays focus on death and war; the United States government's articulation of climate change policy focuses on death and war.

In contrast, Great Britain's key document, *The National Adaptation Programme* (HM Government, 2013) emphasises investments. As the ministerial foreword to this report states, 'Britain has a long history of overcoming the challenges that our famously changeable weather poses and harnessing our natural resources to support growth. New investments and innovation in both the private and public sectors continue this tradition today' (2013, 1). Banking or investment is discussed on average once every two pages in this document. In contrast to the United States' documents, the British document does not mention anything dying or being killed, and the military is only mentioned once.

The key document from the People's Republic of China is *China's Policies and Actions for Addressing Climate Change* (People's Republic of China, The National Development and Reform Commission 2013). In this report, industry or industrialisation is mentioned on every single page. Like the British document, there is no killing or dying, and there is no mention of the military, either.

In effect, the ways of thinking about climate change in public policy reports reflects the cultural sentiments found in the national holidays: the US emphasises the military, death, and dying; the UK emphasises banking and investment; the People's Republic of China emphasises industry.

This is just one example of how the structure of time throughout the year subtly shapes policy rhetoric if not policy initiatives. This pattern also holds true for the leap second debate—a debate almost entirely unrelated to climate change.

Time, Cultural Sentiments, and the Leap Second Debate

The term 'leap second' refers to a solution to the problem of reconciling a timescale defined by means of atomic timekeepers with the Earth's rotation (see Stevens 2015).

A consequence of the leap second policy is that the majority of the world's population, concentrated as it is in east Asia, has to put up with the leap second being implemented at the beginning of the business day—the time equivalent to midnight at the prime meridian. This is an unconscious consequence of the explicit Eurocentric assumptions that guided the original definition of Universal Time in 1884, such as the following statement by Great Britain's Astronomer Royal W. H. M. Christie in 1886:

The advantage of making the world day coincide with the Greenwich civil day is that the change of date at the commencement of a new day falls in the hours of the night throughout Europe, Africa, and Asia, and that it does not occur in the ordinary office hours (10 a.m. to 4 p.m.) in any important country except New Zealand' (1886, 523).

This logic has, over a century later, resulted in a European minority of the world's population sleeping through any disruptions caused by the leap second while others have to contend with the leap second coinciding with the beginning of morning business cycles.

Eventually, problems with the leap second caught the attention of the West. In the 1990s, as networked computing became important and reliant on precision timing, some began pointing out problems generated by the leap second. Timestamps are a means of maintaining computer security across networks. If a computer receives a bit of code from another computer with a timestamp outside of the expected range, then it is deemed a security threat—it is considered as either a fraudulent timestamp or, if the timestamp indicates an unexpected delay in the signal's travels then, it indicates the possibility of somebody inserting malicious code somewhere along the way, thereby causing the delay. So, unexpected timestamps tend to result in computers rejecting the associated information or commands. If such rejection occurs throughout a networked system, it can cause system-wide problems and eventually cause servers to crash.

Since leap seconds are not predictable the way that leap years are, they cannot be written into operating systems. Instead, when a leap second is announced, software patches need to be developed to ensure that a computer handles the leap second correctly. If a systems administrator does not handle the leap second correctly, then the system might go down, as when Qantas Airway's reservation system crashed after the 2012 leap second.

The leap second policy is decided by the Radiocommunication Sector of the International Telecommunications Union (ITU-R)—an agency of the United Nations. In 2001, the ITU-R called for research on the leap second question, and there has been a policy debate ever since then over whether or not to keep the leap second. The United States, the United Kingdom, and the People's Republic of China have adopted differing positions and different argument style in advocating their positions.

Given the militaristic sentiments of the United States, it is no surprise that the leap second debate emerged in association with an American military technology as it was made available for civilian use: GPS (McCarthy and Klepczynski 1999). As the debate has unfolded, those most vocally involved have been American astronomers, computer programmers, time metrologists associated with the United States Naval Observatory or the United States National Institute of Standards and Technology, and those who work for the Department of Defense or military contractors. Consistent with American cultural logic emphasising death, one of the most common arguments for eliminating the leap second policy is that eventually a leap second will cause a problem such that 'planes will crash and people will die' (Allen 2013; Sobel 2013; Wolman 2013).

The British position is to keep the leap second. This position is closely linked to the sense of the prime meridian in Greenwich being a part of British heritage. Eliminating the leap second would decouple timekeeping from the prime meridian, and as the former minister of Science and Universities complained, eventually the meridian for midnight would be over the United States (Swinford 2014). Truthfully, it probably would not even reach Big Ben in that minister's lifetime, however. In 2014, the United Kingdom hired a research firm to conduct a study to learn how the British public felt about the issue (Silver et al. 2014). Since most members of the public knew nothing of the issue, much of the study involved educating focus groups about the leap second, and not surprisingly, such efforts at education contained subtle biases towards the British position to keep the policy. That said, the conclusion of the study was that unless there were strong technological or financial cases made for getting rid of the leap second, most members of the British public would not support doing so (Silver et al 2014, 52).

Once again, while the American position is tied to the military and people dying, the British position highlights banking and finance.

The Chinese position has been evolving. Initially, representatives of the People's Republic of China's argued that since the solar day was important to the Chinese people, decoupling the global timescale from the Earth's rotation would be disruptive (Han 2013). In 2015, at a conference in Australia, the Chinese representative, Dr. Han Chunhao, offered a different argument. He documented traditional Chinese timekeeping practices and made the argument that those practices were just as scientific as the timekeeping practices of the West. Therefore, while he supports

eliminating the leap second policy, he advocates creating a means of disseminating Earth rotational information so that traditional Chinese timekeeping could be maintained, and he suggests that the global navigation satellite systems be used for this purpose. Referring back to the People's Republic of China's secular holidays—most of them are tied to the traditional Chinese calendar. The Chinese leap second position, like the US and UK positions, reflects the sentiments expressed in public holidays. Returning to the points made earlier, it also reflects the Chinese consciousness of being forced to adapt to Western time-keeping, and a desire for the West to reciprocally adapt to support Chinese time-keeping.

Conclusion

The relationship of time, politics, and globalisation involves the interaction of the global imposition of a Western timescale, local ideas of timekeeping, and how cycles of holidays shape sentiments and approaches to political challenges. Most of these issues lurk beneath the surface of consciousness—overshadowed by ideologies such as the world being flat (Freidman 2005), or time being 'natural'. Even in debates about time policies, such as the current leap second debate, the sentiments reinforced, if not shaped, by national holidays still influence the positions and arguments that representatives from different nations make. Consistent with the history of the global time system since 1884, when Universal Time and the prime meridian were determined, a few European nations and the United States have an influence over time policies that is disproportionate to their percentage of the world's population. The leap second debate is largely a debate between Western time metrologists that the world has been asked to adjudicate through the ITU-R.

The discussion of climate change indicates that the way in which temporalities shape sentiments goes far beyond time policies, however, but affects other, if not all, issues of global importance. The similarity of arguments about leap seconds and climate change suggests cultural inclinations creeping into scientific and policy debates in ways that are rarely, if ever, acknowledged. Whether it is the sentiments cultivated by different calendars and holidays, or the conflicts generated when different temporalities collide, time exerts a subtle and pervasive force on political activity and negotiation—a force that is rarely recognised.

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