

## The Missing 12 Days of September

21 October 2008

On the night of Wednesday, September 2<sup>nd</sup>, 1752, John Hackney closed his eyes and went to sleep. When he awoke to the dawn, it was Thursday, September 14<sup>th</sup>, 1752. John Hackney, my great-great-great-grandfather, did not sleep through those 12 straight days. Instead, he was just like every other subject in the realm of George II, King of the United Kingdom (1683-1760), who had finally decided to replace the outdated and inaccurate Julian calendar with the Gregorian calendar after a 170 year delay. But, since the Gregorian calendar restored alignment between the calendar year and the sun, the British Empire lost 12 days at the stroke of midnight of September 2<sup>nd</sup>, 1752, when it was implemented.

The Gregorian calendar was proclaimed by Pope Gregory XIII (1502-1585), and took effect in most Catholic countries by 1582. However, just as the United Kingdom had lagged, it was not adopted in Poland until 1586, in Switzerland until between 1583 and 1812, in Japan until 1872, in China until 1912, in both Turkey and Soviet Russia until 1918, and in Greece until 1923. The Gregorian calendar remains in use throughout western civilization today. In fact, it is the calendar currently hanging on your wall.

The Gregorian calendar was created to update and correct the inherent errors in the Roman Julian calendar. A primary difference between the two is that the Gregorian corrects a leap year fault, which caused the cumulative error in the Julian calendar that led to the loss of 12 days in September for John Hackney and the rest of the British Empire.

Secondly, the Gregorian calendar was originated as a Christian calendar, so it has always used a base year set to the birth of Jesus Christ. The original Roman Julian calendar, established by its namesake, Julius Caesar, in 45 B.C.E., uses a base year not of 0 C.E., but of 4713 B.C.E. Its base year was derived by calculating when three major time cycles of the era—the Roman Julian calendar, the lunar calendar and the Roman tax calendar—coincided in history.

In addition, the Gregorian calendar firmly established 1 January as the beginning of the year. Previously, the year began on either 25 December or 25 March, depending on the location or era.

The fourth significant difference between the original Roman Julian and Gregorian calendars was official adoption of the chronological notation used to identify years before and after the Gregorian base year: B.C. (before Christ) and A.D. (*anno Domini*, a Latin phrase meaning “in the year of our Lord” not, as is commonly thought, “after death”).

The concept of consecutively numbering years and dividing chronological time with B.C. and A.D. is attributed to Dionysius Exiguus (Denis the Little) (6<sup>th</sup> century), but the notation was not widely accepted until popularized by the Venerable Bede of Jarrow (673?–735). However, prior to the adoption of the Gregorian calendar, the use of B.C. and A.D. remained inconsistent, primarily due to the variety of year initiation dates then in use.

In the science of time and calendars, B.C. and A.D. notations are simply another example of arbitrary segmentation of chronological time. In that sense, B.C. and A.D. are no different than a typical regnal notation system, e.g. “year xx in the reign of monarch y,” such as that used in the Egyptian calendar system.

In recent decades, B.C.E. (before current era) and C.E. (current era) have become standard and accepted English language terms used to refer to Gregorian calendar dates for scientific, historical and non-Christian subjects.

## The Missing 12 Days of September

Some Christians are offended by any use of B.C.E. and C.E. These people, many of whom are passionate and sincere, view the use of B.C.E. and C.E. as a dilution or dismissal of Christianity. It is critically important for these people, and others in Western societies, to remember that the Gregorian calendar is, in and of itself, Christian. Whether you use C.E. or A.D. is essentially immaterial in that respect, since the base year of the calendar is a Christian religious date.

Because Christian nations came to dominate international commerce in the last few centuries, the Gregorian calendar now pervades not only the predominately Christian West, but also global business and trade. Except in very few places, every person involved with business and commerce, regardless of whether or not they are a passionate and sincere believer of a non-Christian religion or a non-believer, is forced to use a calendar based on Christianity.

Can those people also be expected to use A.D., (*anno Domini*)? Can they, in good conscience, be expected to proclaim a date "in the year of our Lord" when they are passionate and sincere believers in a non-Christian religion, or non-believers in any religion at all? Can expecting them or compelling them to do so lead to anything other than animosity and resentment?

Can any sincere and passionate Christian honestly say they would not feel animosity and resentment if they were forced to use a calendar system with a base year of the day of Muhammad's flight from Mecca to Medina? Could any sincere and passionate Christian say, with integrity, that they could use a calendar notation of A.H. (Anno Hegiræ—the Arabic word for "separate" or "go away") and feel no ill will for its imposition over their chosen religion? Such would be the case if the Islamic calendar system dominated global commerce.

In addition to the issue of fundamental human fairness and understanding, Christians who seek to limit, restrict or remove any secular or non-Christian aspects of time face an uphill and challenging battle.

For instance, the days of the week are all named for various pagan deities.

- Sunday – (ME) sun(nen)day, (OE) sunnandaeg, translation of Latin dies Solis, "Day of the Sun." The sun is arguably the most commonly worshiped deity in human history.
- Monday – (ME) mone(n)day, (OE) mondaeg, translation of Latin Lunae dies, "Day of the Moon."
- Tuesday – (ME) tewesday, (OE) tiwesdaeg, (OHG) ziestac, Day of the war god, Tiw, translation of the Latin dies Martis, "Day of Mars."
- Wednesday – (ME) Wednesdai, (OE) wednesdaeg, mutated version of Wodnesdaeg, Woden's day, compare with Dutch Woensdag, Danish onsdag, translation of Latin Mercuru dies, "Day of Mercury."
- Thursday – (ME OE) Thursdaeg from Norse Thursdagr, Germanic translation of Latin dies Jovis, "Thor's day."
- Friday – (ME OE) Frigedaeg, meaning the day of Frige, the Anglo-Saxon form of Frigg, a Germanic translation of Latin dies Veneris, "Day of Venus."
- Saturday – (ME) Saturdai, (OE) Saternesdaeg, partial translation of Latin Saturni dies, "Saturn's day."

ME = Middle English

OE = Old English

OHG = Old High German

## The Missing 12 Days of September

In addition, the months are named for pagan deities, pagan festivals, pagan emperors, or pagan numbers.

- January: Janus, Roman god of doors, beginnings, sunset and sunrise, had one face looking forward and one backward.
- February: On February 15, the Romans celebrated the festival of forgiveness for sins; (februare, Latin to purify).
- March: Mars, the Roman god of war.
- April: Roman month Aprilis, perhaps derived from aperire, (Latin to open, as in opening buds and blossoms) or, perhaps, from Aphrodite, original Greek name of Venus.
- May: Maia, Roman goddess, mother of Mercury by Jupiter and daughter of Atlas,
- June: Juno, chief Roman goddess.
- July: Renamed for Julius Caesar in 44 BC, who was born this month; Quintilis, Latin for fifth month, was the former name (The Roman year began in March rather than January).
- August: Formerly Sextilis (sixth month in the Roman calendar); re-named in 8 BC for Augustus Caesar.
- September: September, (septem, Latin for 7) the seventh month in the Julian or Roman calendar, established in the reign of Julius Caesar.
- October: Eighth month (octo, Latin for 8) in the Julian (Roman) calendar.
- November: Ninth Roman month (novem, Latin for 9).
- December: Julian (Roman) year's tenth month (decem, Latin for 10).

It seems to me both futile and pointless to struggle to maintain the Christian purity of time via the mandated and universal use of B.C. and A.D. when, with every mention of a day or month, you invoke pagan gods, pagan festivals, pagan worshipers or pagan cultures.

The Gregorian calendar, with a foundation of an inherently Christian base year, nevertheless uses names whose etymologies are entirely non-Christian. That is but one of the ironies and exceptions of the Gregorian calendar not readily apparent to most members of western cultures.

Almost every person in western societies has lived their entire lives using the Gregorian calendar system. As a consequence, we simply assume that it is fundamentally right, good and universal. Actually, although it is not readily apparent from a western perspective, the Gregorian calendar is but one of many calendar systems used in the world today.

For instance, the time span of the Nazca civilization, 600 B.C.E. to 200 C.E., is expressed as 1501914.5 to 1794108.5 in Julian Day form, a scientific date method used in astronomy.

Other forms of expressing that date range include:

Religious				
Julian Day	Hebrew	Islam	Bahá'í	Gregorian
1794108.5	3960	-435	-4.9.Bahá	200 C.E.
1501914.5	3160	-1260	-6.5.Abad	600 B.C.E.

Culture				
Julian Day	Persian	India Civil	Chinese	
1794109	-423	121.Pausa.11	metal.monkey.57.35	
1501915	-1223	-679.Pausa.11	metal.dragon.17.49	

## The Missing 12 Days of September

Science, Government & Business			
Julian Day	Modified Julian Day	ISO Week	
1794109	-605892	200-W01-1	
1501915	-898086	-600-W01-1	

Technology			
Julian Day	UNIX	Excel	Mac
1794108.5	-5.6E+10	-620911	-622372
1501914.5	-8.1E+10	-913105	-914566

History			
Julian Day	French Republican	Mayan Long Count	Christian Julian
1794108.5	-1592	8.8.0.11.6	200-01-02
1501914.5	-2392	6.7.8.17.12	-601-01-08

These examples are just a few of the many calendar systems used around the world. Other calendar systems in cultural, religious, historical or scientific use include: Assyrian, Armenian, Attic, Aztec (Tonalpohualli – Xiuhpohualli), Babylonian, Bengali, Berber, Bikram Samwat, Buddhist, Burmese, Celtic, Coptic, Egyptian, Ethiopian, Germanic, Hebrew, Hellenic, Hindu, Indian, Iranian, Irish, Japanese, Javanese, Juche, Julian, Korean, Lithuanian, Malayalam, Maya (Tzolk'in – Haab'), Minguo, Nanakshahi, Nepal Sambat, Pawukon, Pentecontad, Rapa Nui, Roman, Rumi, Soviet, Tamil, Thai (Lunar – Solar), Tibetan, Vietnamese, Xhosa, and Zoroastrian.

As you can see, there is a bewildering array of ways to view chronological time, all products of humanity's attempt to grasp and quantify time.

When discussing time, it is very important to remember that time, as we think of it, is a completely artificial construct. For example, regular same-length hours did not become part of life until reliable mechanical clocks arrived at the end of the 13<sup>th</sup> century. Until then, the relative length of day and night hours changed with the seasons and the available daylight. During summer, daytime hours were longer and nighttime hours shorter; in winter, daytime hours were shorter and nighttime hours longer. Even water clocks and sundials in ancient Egypt contained different scales for different times of year to measure out different length hours. Time, as you and I live it, was largely developed and implemented to make life easier for merchants and bureaucrats. Prior to the rise of the merchant and governing class, time, as we relate to it, did not exist.

Prior to that era, time consisted of three primary and conflicting cycles: the daily rising and setting of the sun, the moon's phases, and the annual circuit of the sun. Chronological time requires day counts or one or both of the moon's phase cycle and the solar orbit cycle. Unfortunately, neither of those two elements of time conveniently relates to each other in whole numbers. Humanity has been struggling since the beginning of recorded history to resolve that conflict and provide a reliable means to measure, predict and chronologically record time.

Consequently, throughout history, calendars were normally of a dual nature, i.e., lunar (lunar cycle month) or solar (sun orbit year). The lunar calendar was typically religious, and tied to religious festivals and events. The solar year was usually civil, and linked to crop planting and harvests, as well as tax collection and loans.

## The Missing 12 Days of September

Unfortunately, 12 lunar months are about 354 days, and do not equal an approximately 365 day solar year. Some societies, such as the Maya, maintained completely separate calendars for each purpose. Lunar calendars, such as the Islamic, use only the moon phase cycle and ignore the solar year. Solar calendars, such as the Gregorian, ignore the moon and exclusively demarcate the earth's orbit around the sun. Luni-solar calendars, such as the Hebrew, attempt to reconcile both lunar and solar into one calendar.

Because we grew up with it, we tend to assume the Gregorian calendar is the ultimate expression and highest possible evolution of chronological time measurement. In reality, it is just another kludge which attempts to resolve the hard realities of time—a 365.24219878 day year and a 29.530588 synodic (period between successive new moons) month—within a structure that is both comprehensible and culturally practical.

When you add a base 60 minute and hour (60 units per measure), along with a base 24 day (24 units per measure) into the mix of varying base 28/29/30/31 months and irregular base 365/366 years—which are on an exception driven 4/400 periodicity cycle—you begin to get an idea of the complexity of the time and calendar system we intuitively understand only because we've lived with it since birth.

John Hackney (1744-1809) was born under the Julian calendar and died under the Gregorian. He probably spent little time pondering whether his day was measured dawn to dawn, noon to noon, sunset to sunset or midnight to midnight. He probably knew nothing of the 18 year 11 1/3 day calendar cycle of the Babylonians, the 19 and 76 year cycles of the Greeks, the 1,460 year cycle of the Egyptians, the 7,980 year cycle of the Romans or the 63,081,429 year cycle of the Mayans. He probably lost little sleep worrying about the implications of a calendar system based on a 365.242 day year versus 365.242199 days. But, even though John probably knew less about the calendar than he did about his horse, his life was still dramatically affected after falling asleep on his Julian calendar's Wednesday, September 2<sup>nd</sup>, 1752, and awaking to find himself living 12 days later in a Gregorian calendar world.

We too, are dramatically affected by our calendar, although in ways that are primarily cultural in nature rather than in John's metaphysical loss of 12 days in September. Even though we may know as little about time and how calendar systems work as John, it is incumbent upon us to keep our calendar system in perspective, understand its context, and appreciate its impact on other people who share our world.

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## The Missing 12 Days of September

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My thanks to our friend, Kent Richardson, whose comment on my tongue-in-cheek story regarding a theory about the Nazca Lines archeological site, [Line Ball](#), inspired this essay.

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Most calendar system date conversions used in this essay were performed at this site:  
<http://www.fourmilab.ch/documents/calendar/>

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John Hackney was born in Wilmington, New Castle County, Delaware, 23 November 1744; married Rebecca Laughlin in Frederick County, Virginia, on 8 June 1770; and died 11 November 1820 in Friendsville, Blount County, Tennessee. He was married twice and fathered ten children. John Hackney, like all of my Hackney ancestors, was a Quaker. He was co-founder of the Quaker community of Friendsville, Tennessee, on land formally owned by Thomas Hackney.

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What was to become the Gregorian calendar was authorized by the Council of Trent in 1545. However, it was not until 1572 that an adequate solution was devised. The calendar's final form was defined by Jesuit astronomer Christopher Clavius (1537–1612), using suggestions made by the astronomer and physician Luigi Lilio (also known as Aloysius Lilius; died 1576). The Gregorian calendar was formally enacted by the issuance of the papal bull *Inter gravissimas* ("In the gravest concern") issued on 24 February 1582, by its namesake, Pope Gregory XIII.

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All photos by Douglas Hackney

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Photo by Jorge Valdes

Douglas and Stephanie Hackney are on a two to three year global overland expedition.

You can learn more about their travels at: <http://www.hackneys.com/travel>