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Updating the Calendar

IT MAY COME AS A SURPRISE to some people that a question about the excellence and accuracy of the calendar should be raised. Has it not come down to us hallowed by tradition and laden with associations since the beginning of time? Are not our birthdays and weddings and other anniversaries irretrievably involved in the present arrangement?

Practical business economics, social convenience and scientific accuracy are motives forcing us to give fresh thought to something we supposed was settled for good. The irregularities of the Gregorian calendar have become increasingly evident in these days of swift communication, complicated business calculations, statistical comparisons, and computer operations. In short, the calendar is out of date.

The whole basis of our measurement of time is fictitious. The zero adopted for starting the day is the instant when a fictitious body known as the "mean sun" is on a chosen meridian, which is an imaginary line running from pole to pole.

Even in building up our calendar we erred: we passed from 1 B.C. to A.D. 1 disregarding the zero year thus telescoping two years into one. We boast that our computers demand exact data if they are to function accurately; what self-respecting computer would deal with programming on such a wobbly basis?

About time-keeping

Our everyday calendar is an artificial medium that has been juggled with through the centuries in an effort to make it more accurate and more useful.

The periodical occurrence of natural phenomena gave rise to the first divisions of time. Twenty-three centuries ago Aristotle recognized that the sole measurer of time is motion, and it is the three well-known motions of earth, sun, and moon that play so important a part in our life affairs. They furnish our imaginations with natural yardsticks by which elapsing spaces may be divided into calendar and clock time.

Primitive man, not being able to count in high numbers, found the changing phases of the moon handy to indicate long periods of time. Later, he recognized the changes in the sun's daily path as keeping step with the seasons. As an outcome, we have three types of calendar: the lunar, which keeps step with the moon, and ignores the sun and the seasons; the solar, which is in step with the sun, but disregards the moon; and the lunar-solar, which attempts to combine the two.

A calendar introduced in 46 B.C. ignored the months and was content with making the days fit into the year. This was done by inventing the leap year, without realizing that adding an extra day every four years rather overdid things. By A.D. 1582 this small error had amounted to more than ten days.

The sixteenth century revision provided for omission of the leap year once in a century unless the number of the century is divisible by 400. This whittled down the error to one day in every 3,343 years.

A Persian mathematician and astronomer, Omar Khayyam, more remembered today for his *Rubaiyat*, proposed in 1079 to postpone the leap-year sequence one year every thirty-two years, thereby reducing the error to one day in 5,000 years, but his proposal was ignored by the Gregorian reformers.

There have been all sorts of ways tried to keep track of the passing days. Clay tablets found in the ruins of Babylon divided the year into 360 days, making twelve neat months with thirty days each, and the consequent inaccuracy was made up by adding an extra month every once in a while.

The Aztecs left behind them a calendar stone recording eighteen months of twenty days each, with five extra days at the end of the year which were named "useless". The Aztecs did try to keep up with things by intercalating 25 days every 104 years, thus providing a nicer adjustment to solar time than that of any European calendar of the same period.

In Russia, experiments were made with a twelve-month calendar, each month having six weeks, so as to attain a five-day week. That lasted from 1923 to

1931, then a change was made to a six-day week, and in 1940 Russia returned to a seven-day week.

During the French Revolution a new calendar was introduced in which the year had twelve months of thirty days each, and the five days left over were celebrated as festivals dedicated to Genius, Labour, Virtue, Opinion and Rewards. This calendar lasted twelve years.

Life and time

Life is essentially periodic. It is made up of daily periods with their alternations of work and play, of activity and sleep; and seasonal periods, which dictate our school terms and our holidays; and yearly periods.

There are no "moments" in the sense of a station in time. The moments and minutes and hours and days are our intellectual parcellings of time's unbreakable continuity.

This passing of time is confusing. The day moves around the earth at different speeds. In Central Europe it is from 620 to 680 miles per hour; in Northern Canada it is only 530 miles per hour. This time differential amounts to four minutes per degree of longitude, and fifteen degrees of longitude makes a difference of an hour.

Sir Sandford Fleming, chief engineer of the Intercolonial Railway and of the Canadian Pacific Railway, cured the world of its clock-time madness. It used to be that on a trip only half way across Canada you had to carry a watch telling the time at Halifax, Quebec, Montreal, Ottawa, London and Toronto.

Fleming proposed, and carried through after twenty years of effort, the institution of standard world time, using twenty-four standard zones, each lying between two agreed-upon meridians of longitude. Within every zone all clocks are set to the same standard time, and the time in another zone can be readily worked out. By 1883 all railways in Canada and the United States had approved Fleming's plan, and within a few years nearly all civilized countries were using it. Today, there are seven time zones in Canada: Newfoundland, Atlantic, Eastern, Central, Mountain, Pacific and Yukon.

Another triumph of modern thought over old prejudices was the international date-line, drawn through the Pacific Ocean near longitude 180 degrees. When the line is crossed from west to east a second 24-hour period is given the same date and name as the 24-hour period just passed. In the opposite direction, a calendar day is omitted.

It is obvious, therefore, that when changes in our time- and date-keeping become necessary and helpful we can bring ourselves to make them.

Pressure for change

An increasing pressure for improvement has come from business groups and statisticians, who find the

present irregularities of month intervals and composition a serious obstacle to the achievement of comparability of records.

The variation of days in the month causes trouble to merchants, because the various days of the week are not of the same value as regards the volume of trade.

An extra Saturday in a month, as compared with the same month in another year, results in seriously distorted figures unless proper and costly adjustment is made. June 1968 has five Saturdays and five Sundays. June 1967 had four of each: June next year will have four Saturdays and five Sundays. There may be a variation of 11 to 12½ per cent in the number of working days in a month.

It is the purpose of calendar reformers to produce a calendar in which corresponding months in all years would have the same days exactly. As things stand now, the phrase "As compared with the same period last year" is full of headaches for the statistician and the business man.

There is a further thought to have in mind. All of us must be date-conscious. A difference in date changes things. That is why business firms are so meticulous about writing or stamping the date on correspondence. Alfred Korzybski, who was the originator of what he called "General Semantics", advocated a "date signal". This was to be appended, at least in one's mind if not on paper, to thoughts and records of events, to remind us that Canada July 1₁₉₆₈ is not Canada July 1₁₈₆₇ and son₁₉₅₈ or daughter₁₉₆₀ are not the same today. These reminders are equally valid in industry, commerce and society.

Some difficulties

There is clear exasperation with the way Easter moves around its 35 possible days, playing havoc with what should be a smooth order of church, educational and social activities, as well as with retail selling, for which Easter marks a division of seasons.

Last year Easter fell on March 26th; this year on April 14th, a difference of nearly three weeks; and in 1969 it will fall on April 6th. The festival shifts around because of the efforts to square the lunar month with the solar year. It is calculated, not on the real moon, but on a hypothetical "paschal moon" existing only for this purpose.

It was in A.D. 325 that the Council of the Christian Churches at Nicea decided that Easter shall be on the first Sunday following the Paschal Full Moon which happens upon or next after the spring equinox, either March 20th or 21st.

The observance of Easter is an ecclesiastical matter, and having it on a fixed date is not essential to improvement of the calendar.

In October 1963, the Vatican Council voted by an enormous majority — 2,058 to 9 — in favour of a fixed date for Easter, the date to be subject to agreement with others concerned. "This," reported the

Manchester Guardian, "is the longest step forward that has ever been made towards the stabilization of Easter, and with it of the whole of the Christian year."

In 1967 the World Council of Churches asked its members their opinion. Of 115 churches that replied, 97 favoured Easter observance on the first Sunday after the second Saturday in April. There has been a swing recently to observing Easter on the second Sunday. Then it would fall, in the Gregorian calendar, between April 8th and April 14th, and in The World Calendar always on April 8th.

But not only people of the Christian faith are affected. The calendar serves people of all religions. India, with 300 million Hindus, 35 million Moslems, and 8.2 million Christians, proposed to the United Nations in 1953 that the calendar should be revised.

There are some who object to changing the calendar because certain dates have acquired particular significance to them. But all dates are merely conventions for convenience sake. None of us observes his birthday in exactly the proper twenty-four hours. Every four years the calendar is about twenty-four hours behind the astronomical or true solar year.

There is a notation in the Family Bible saying that George Washington "was born ye 11th Day of February 1731/2 about 10 in the morning." This indicates that the year of his birth was 1731 for those who began their years with March 25th, and 1732 for those beginning the year with January 1st.

Not a revolution

Today's movement for calendar reform is not seeking to blot our calendar from existence, nor even to change it greatly, but only to place the months, weeks, and days more rationally so as to eliminate many headaches, much cost, and a great deal of confusion.

We could, but do not desire to, change our week; the seven-day week is deeply imbedded in tradition, religion and convenience. We can change our month, which is an irrational division of time conforming to neither moon nor sun.

Lunar calendars are unavoidably lunatic. A twelve-moon period is about $11\frac{1}{4}$ days short of a solar year, and when this sort of thing goes on for a number of years winters start arriving in summer. The moon averages a revolution of the earth (new moon to new moon) in 29 days, 12 hours, 44 minutes, 2.8 seconds, but may range six hours or more on either side of the average. You cannot divide the moon's circuit of the earth, 29.53059 days, into the earth's circle of the sun, 365.24219 days, and make the answer come out to the kind of month a business man would want to write at the top of his letters.

The speed of the earth in its orbit is something we cannot do anything about, and if we were able to meddle with it we might succeed only in causing confusion in some other part of the universe with which we are in undreamed-of synchronism.

That leaves us to make paper plans. The astronomers

adjusted the calendar to the length of the sun year; we have to look after the adjustment of the calendar's months and weeks within the year. Our great need is for a perpetual calendar, one which will remain unchanged year after year.

Credit where it is due

We must admit that the ancients deserve credit for knowing as much as they did about spreading weeks and months around our solar orbit, even though we think that activities of this high-speed age are poorly served by a hodgepodge of months invented by the Romans 2000 years ago and only patched up since.

Egypt takes first place in the calendar stakes. July 19, 4241 B.C. is the earliest certain date in human history. That date, found by a calculation of the period of Sirius, was the basis of the Egyptian calendar. As long ago as 4236 B.C. the Egyptians had twelve months of thirty days, and added five "heavenly" days. They did not do anything about the odd quarter of a day, but made a note of it, merely observing that it automatically adjusts itself every 1,460 years.

According to Jewish tradition, creation took place in September or October of 3761 B.C. This date does not have any dogmatic sanction in Judaism, but it is used as the starting point in the Jewish calendar while Christians and Moslems reckon the years from the lifetimes of their founders. This is year 5728 in the Jewish system.

The Mohammedan calendar moves nonchalantly through the seasons, making no effort to reach reconciliation with the sun, and only getting into step with the solar year momentarily about every thirty years. It is stipulated in the *Koran* that "God created the moon and appointed its houses in order that men might know the number of years and the measure of time."

The Romans got along with a ten-month year aggregating 304 days until Numa Pompilius added two months in the seventh century B.C. By 46 B.C. the calendar had got into such a state that there had to be a year of 445 days to catch up, which was too disturbing even for those days. Julius Caesar named it "the last year of confusion", and called upon the astronomer Sosigenes to help restore order.

As you stand on the Janiculum Hill in Rome you look down upon the villa where Cleopatra lived while Egyptian court astronomers helped to reform the calendar. The Egyptian calendar was adopted, but its five "heavenly" days were distributed throughout the year, adding one day to every other month and taking one day off February. Then Augustus Caesar put his thumb in the pie and pulled out seven months of 31 days, four months of 30 days, and one month with either 28 or 29 days.

Toward the close of the sixteenth century there had accumulated a difference of ten days between this altered Julian calendar and the sun's time, so that the equinox fell on March 11th instead of 21st. Pope Gregory XIII decreed that October fifth should be

called October fifteenth in 1582, thus readjusting the calendar to the tropical year.

By the time England got around to making the change, in 1752, the lag was eleven days. The difference between the Old and New Styles was eleven days after 1700, twelve days after 1800, and it has been thirteen days since 1900. It will remain 13 days until 2100.

No logical objection

Old ideas give way slowly, because they are habits, predispositions, deeply engrained attitudes of aversion and preference. There is, obviously, no logical reason why we should, every year, act regarding our calendar as the Hong Kong tailor did when he was asked to duplicate a suit. He reproduced it with all its stains and patches.

The fact that the calendar is basically 2,000 years old is not a good reason for opposing change, though it may have a bearing upon the advisability of making any changes as moderate as possible. The argument of affection for time-honoured antiquities does not hold water, because our calendar in its present form has been in use in English-speaking countries for only two centuries, and in some other countries for less. The plea that calendar change is "against nature" brings nothing but smiles from those who have scanned the history of calendar-making. Calendars, like clocks, are nothing but man-made time measurement standards, full of inconsistencies.

Objection to change may be expected from many quarters. In England the farmers blamed a crop failure on the calendar reform. Workers believed that they had been cheated of eleven days' wages, and rioted with cries like "Give us back our fortnight." After the transition from the Julian to the Gregorian calendar in Great Britain, more than one-third of all the litigation for the following seventy years was caused by the shifting of dates.

Some suggestions

Living in a rapidly changing order as we do, change has begun to lose its terrors.

There have been at times as many as three hundred suggestions of ways to improve the calendar. When the question first came before the League of Nations in 1923 the delegates had 185 proposals, later reduced by a committee to two.

A thirteen-month year was advocated more than a century ago by a French philosopher, Auguste Comte, and was sponsored in recent years by the International Fixed Calendar League, which closed its office in 1936. It would retain the $365\frac{1}{4}$ -day year. There would be thirteen uniform months, each with four whole weeks beginning with Sunday and ending with Saturday. A new month, called "Sol", would be inserted between June and July. There would be a year-end day belonging to no month, and in leap

years another day would be inserted between June and Sol.

One objection is that the number thirteen is unpopular, not only because it is difficult to divide by and impossible to divide into, but because of the superstitions attaching to it. The thirteen-month calendar would have thirteen Fridays falling on the thirteenth.

The World Calendar, less difficult in its calculations, and less troublesome in the change-over, is supported in Canada by the International World Calendar Association, Ottawa. This calendar has an equal number of weeks and days in each quarter, the same number of weekdays (26) in each month, and every year alike. It does no violence to the Gregorian arrangement of time, but rearranges the days of the months so that the first month in each quarter has 31 days and each of the other two has thirty.

Substantial advantage is claimed for business. For instance, under The World Calendar plan a quarterly note can be made an exact quarter of the annual rate, and a thirty-day note a third of the quarterly rate. This is true even in the thirty-one day months, because the extra day is always a Sunday. Holidays and anniversaries would always fall on the same day and date. Any day, week, month or quarter of one year would be comparable to the same day, week, month or quarter in any other year.

The World Calendar would preserve the easily divided number twelve for the months. Only three dates would be lost — 31st March, May and August — and three dates would be added — 29th, 30th February and 31st April. In leap years the extra day would be inserted after June 30th as Leapyear Day, a world holiday. After 52 weeks the year would end with World Day, a day set apart from week and quarter.

It was widely hoped by its advocates that The World Calendar would be adopted by the United Nations in time for the change-over on January 1, 1956, a year when the Gregorian and World Calendars would coincide. To effect the change with the least disturbance, the year it is done should end with December 30th falling on a Saturday and the 31st on a Sunday, as it did in 1967 and will again in 1972, 1978, 1989 and 1995.

So there we are. We have a calendar which has come through many adventures and is still far from perfect, and a proposal for its adjustment. A really perfect calendar is impossible, because we cannot reconcile natural fixed periods which are not reconcilable. What is needed is the greatest attainable accuracy combined with the greatest feasible convenience and the least upheaval.

No country single-handed could bring about the change. The world is drawn so close by interests and communications today that to have several different calendars would cause endless trouble. But a sane calendar is the hope of many people, because truly "The time is out of joint", and this generation may have been charged to set it right.