

## THE CALENDAR

Of the many limitations which confine the activities of us mortals there is none which is more ever present or more real than that which we call Time. This is none the less true despite the fact that since time is not perceptible to any of our five senses it must exist only in our minds. It is not difficult to believe that the consideration of Time must have occupied the attention of man since the dawn of conscious thought. However man has succeeded in dealing with this elusive subject in only one manner - to measure its speed - This speed - we assume as an axiom - to be constant altho the scientist in recent years, has even dared to question this and all of us have known occasions when the clock dragged or the speed of days was unbelievably accelerated.

In accomplishing the measurement of this speed which for the purposes of this paper we will consider as constant, Nature has given us at least three units of measurement of absolute independent perfection - the rotation of the earth upon its axis - the span of the moons journey around the earth and the duration of the earths rotation about the sun - the day, the month and the year. In utilizing these natural units however we are confronted with the stubborn fact that the second unit is a multiple of the first only in the absurd ratio of being 29 days, 12 hours, 44 minutes and 27 seconds to one day while the year is 365 days, 5 hours, 48 minutes and 45.51 seconds long. Certainly the heavens are not constructed on the metric system.

To the ancients the month was of far more importance than the year so they took the opposite horn of the dilemma from us and used the month as their unit and more or less let the years take care of themselves by using alternate months of 29 and 30 days. About 432 B.C. the astronomer

Meton of Athens made the astonishing discovery that 235 lunations occupied 19 solar years with a practically infinitesimal margin of two hours. This discovery of a relation between these two apparently irreconcilable natural units of time measurement resulted in the Metonic Calendar which was put into use at the Olympic Games on July 16, 432 B.C. This most complicated schedule called for twelve years of twelve months each and seven years of thirteen months each in each period of nineteen years. The months strictly followed the moon by alternating with periods of 29 and 30 days. Thereafter the metonic number of each year from one to nineteen was engraved on "pillars of marble in letters of gold" and is the same Golden Number used in the prayer book of today in connection with the rule for finding the date of Easter.

This lunar Calendar served for about four centuries when Julius Caesar realized that on account of changes made from time to time to serve the superstitions of the Romans the Metonic Calendar had become a "mess". It was therefore in 46 B.C. or almost two thousand years ago that the revolutionary change was made and our present calendar, based upon the length of the solar year, was adopted. With the assistance of Sosigenes - the Egyptian astronomer, he (Caesar) fixed mean length of the year at 365 and one-fourth days - and decreed that every fourth year should have 366 days and the others 365. This arrangement is incorrect to the extent of only about eleven minutes per year but even this slight defect in about sixteen hundred years had grown to ten days. To correct this Pope Gregory XIII in 1582 decreed that every year of even hundreds should not be a leap year excepting every four hundredth year beginning with the year 2000. With this comparatively minor correction of put and take the astronomical calendar was rendered practically perfect and this was done by men who had

no telescope to aid them in their calculations. The marvel is not at the crudity of this ancient device but at its perfection for if Julius Caesar had not bowed to the superstitions of the Romans and deferred the beginning of the year from the winter solstice for a period of seven days our calendar would today be mathematically correct in measuring the passage of the years. However the defects of the internal construction of the calendar are not difficult to find and soon after the death of the author of the Julian calendar it was rendered even worse by taking from February one day and adding it to August in order to gratify the vanity of the then emperor. To avoid three months of 31 days each coming in succession September was reduced to 30 days and the extra day added to December and this same process applied to October and November-on the original Julian Calendar the odd numbered months all had 31 days and the even 30 except February which had 30 days only in leap year. It is interesting to note that in the original calendar the days in the four quarters in ordinary years were as follows 91 - 91 - 92 - 91 while as a result satisfying this one man's pride we are today contending with 90 - 91 - 92 - 92. The original plan was as close to uniformity as quarters could be made without the use of a "blank" day/ Exclusive of the Gregorian reform practically no change was made or even seriously attempted until 1793 when the French revolutionary calendar was instituted - Besides beginning the year on September 22 - in commemoration of the founding of the French Republic - there were other radical changes in this new plan. The 12 month year was retained with 30 days to each month and five supernumerary days were placed at the end of each year. The time honored week of seven days with its taint of the church was abolished and the month divided into 3 decades of 10 days each. The effort to enforce this calendar reform was carried to the extent of making the observance of

the Lords Day and Saints Day criminal offences. This "reform" however was abandoned after eleven years in 1804 and since then the calendar has been much like Mark Twain's description of the weather - "Something that people talk a lot about but about which little is done".

This is true of the international changes in the calendar and yet Russia's teeming millions constituting a material portion of the worlds population are today using the most radically altered calendar. The Soviet has adopted a five day week - six weeks to each of the 12 months of 30 days with 5 general annual holidays. Each worker has one days rest in 5 but there is no general rest day in the week and all activities are supposed to continue except on these five holidays with 80% of the workers employed each day. This experiment in common with the other activities of this new nation is most interesting but short of their entire philosophy spreading to our world it is not believed that their experience will be of much help in effecting our calendar reform.

The adoption of the daylight saving plan is one of the reforms that seems to have worked. This ingenious device was hinted at by Benj. Franklin when his renowned thrift called to his attention the fact that rising at the usual hour in the summer meant using artificial light in the evening hours when we slept thru several daylight hours in the morning. The first advocate of the simple plan of changing the clock seems to have been William Willett who advocated this plan in 1907 and then died in 1915 the year before its general adoption in Europe.

The objections to the present calendar are numerous. There is a serious inequality in the lengths of the subdivisions of the year - the months - the quarters and the half years are all of unequal length. The

months contain 28, 29, 30 and 31 days - the 4 quarters as shown above are of 3 different lengths and the first half year contains two or three days less than the second. This naturally is the cause of endless confusion in the compilation of statistics and renders them inaccurate in most cases. The second conspicuous defect is the want of fixity due to the fact that the year contains one or two days over 52 weeks. The result of this is that same day of each month in each succeeding year is altered by one or two days. In an attempt to fix dates we find such cumbersome devices as the first Tuesday after the second Monday in a given month. The position of the weeks in the quarter varies each year and overlap from year to year. Without leap year we would have the same calendar at least every seven years but with this change every four years the exact reproduction of the calendar occurs only once every 28 years - approximately the span of a generation. The printing of millions of calendars each year - the complicated tables necessary to compute interest accurately and numerous other objections occur to us. The inequality of the week days as regards the volume of trade and the fact that the quarters and months do not contain the same number of such days prevents any real comparisons of these items and this is probably one of the greatest objections from a material stand point.

To correct at least some of these defects numerous efforts have been made in the last century - beginning with a proposal by an Italian Priest Mastrofini in 1835 to introduce a blank day at the end of the year and have each year begin on Sunday. In 1849 Auguste Comte a Frenchman first proposed the 13 month calendar with a blank day in ordinary year and two such days in leap year. In 1923 the League of Nations appointed a

Committee of Inquiry into Calendar Simplification. This committee presented its report in 1926 and it is of interest to note that altho there were 185 different schemes presented the two general plans above mentioned were two or three which they did not reject. Among the proposals rejected by the League Committee were the following - proposals of four long and 8 short months - calendars with an extra week every five or six years - plans for a decimal system of time measurement - plans for a 5, 6 or 10 day week and such minor reforms as changing the date of the new year and transferring the last day of August to the last day of February. The question of the fixing or stabilizing the date of Easter has been much discussed in connection with calendar reform. The present rule of the first Sunday after the first full moon after the 21st of March covers a range of such a long time - 35 days - that it affects trade in a way that still further injures the usefulness of comparative business statistics. This is really however a question for the Church itself to decide and the League Committee so left it with the suggestion that the Sunday after the 2nd Saturday in April would seem to be the best fixed or stabilized date.

As stated above the League Committee declined to favor any plan except 3 general plans. The first of these and the simplest would practically be the restoration of the Julian Calendar so that each of 3 quarters would consist of 2 months of 30 days and one month of 31 days while one quarter would contain an additional day. There would be no blank day and there would be the levelling up of the quarters in a marked degree. The ascertainment of what day of the week a given day would fall upon would be greatly simplified. This plan would eliminate most of the objections that have been raised to the other two plans but would also

retain many of the defects of the present calendar.

The other two general plans have the common remedy of one or two blank days or days outside of the weeks or months. In order to obtain a fixed calendar for each year this is of course necessary and this simple remedy is at once the most radical change and the most essential feature of true calendar reform. The most radical of these two plans and the one which has received the greatest amount of publicity is the thirteenth month plan. Several variations of this reform have been suggested but the one which is receiving the most consideration is that advocated by M. B. Cotsworth under the title of the International Fixed Calendar. This plan received the enthusiastic and generous support of the late Geo. Eastman who did much to advance its chance of adoption. The plan itself is of the utmost simplicity. 13 months of 4 weeks each - each month starting on Sunday with a blank day between December 28 and January 1st the new month to be known as Sol and inserted between June and July with Leap Day being placed as June 29 altho both it and Dec. 29 would be outside the week.

The third plan now known as the World Calendar has received great publicity in the last two or three years under the sponsorship of the World Calendar Association which is headed by Elizabeth Achelis. The American Advisory Committee contains the names of Geo. Gordon Battle, Prof. H. Parker Willis and Prof. Wm. Starr Myers. Its plan is to retain the 12 month calendar - inserting the blank day between the last day of the old year and the first of the new year. Leap Day to come between June 30th and July 1st. 4 quarters of 91 days each having J A J & O contain 31 days and the other months 30 days each. By starting the year on Sunday each month will contain exactly 26 work days since the 31 day

months will each have 5 Sundays. This will contain only three calendar arrangements - the calendar for the first month of each of the four quarters being identical, the second month of each quarter the same and this also being true of the third month of each quarter.

Both of these plans give a great many advantages over our present system and in considering this matter we may first review some of the reasons advanced against any change particularly one which involves the use of a blank day or days.

One of the most often heard objections is that the use of an **Intercalated** day will disrupt the succession of seven days - thereby interferring with the religious observances of certain days - notably the Sabbath with the Jews and the Lords Day with Christians. This would seem to most of us to be adhering entirely to the form rather than the spirit altho to many of the human race it seems that the form is essential - The Holy See has let it be known that it would not consider this or the stabilizing of Easter as being impossible of its approval. However this is probably one of the most stubborn difficulties that will be encountered. Some of the other objections are that the present calendar is sanctified by tradition, long usage and widespread establishment - that a change would entail great inconvenience and confusion these throwing out all dates in relation to events and records. One of the arguments against any radical change is the great difficulty of making the change. This is undoubtedly true for we must remember that the Gregorian Calendar was not adopted by England for 170 years and was only adopted by Greece and the Greek Church in the last 10 years. To this argument might well be answered that the world today is much more closely knit and the machinery of the League of

Nations is well adapted to speed such needed reforms. The opponents of reform also truthfully point out that a perfect calendar is impossible on account of the lack of correlation between the years, months, weeks and days and that there is no reasonable possibility of changing either the week or the year. The answer to this is obvious that there is little in this life that reaches perfection and if we adopt their rule all progress would cease. These opponents who by the way do not seem to be vociferous further claim that the sentiment for change is not widespread and that there is no definite demand for a change - that the movement is preponderantly commercial and economic and is a result of well organized propaganda.

To these objections the advantages of a reformed calendar seem to present overwhelming arguments - and it would seem that the two remaining questions are which of the two plans of reform are most desirable and how to obtain the change.

In considering the relative merits of the International Fixed Calendar or 13 month plan against the World Calendar or 12 month plan we are struck with the simplicity of the former - each month having the same number of days - the periods for which salaries are calculated correspond exactly to the periods of expenditure. The fact that the months contain the same number of weeks as well as days would of course render statistics more accurate and the fact that one calendar serves for all months is exceedingly helpful in ascertaining the day of the week on which a given day of the month would fall. The proponents of this plan further point out that to the female half of the population a month of 28 days and ten months of 280 days would enable them to better coordinate their physical activities with social and business life. Nevertheless it is of interest to note that

the President of the organization that is advocating the 12 month reformed calendar is a woman. The claim is also made that since most business is done on a monthly basis that the same capital could then do 13 units of work against 12 units under the 12 month plan. That this plan has great merit especially in business statistics is evidenced by the fact that a large number of corporations have already adopted it as an auxiliary calendar and not only compute their costs on this basis but actually do business in units of 13 rather than 12 - paying rent for instance in installments of  $1/13$  of the annual amount provided in the lease.

To the very convincing arguments of the advocates of the Cotsworth plan the World Calendar presents many very real advantages. In the first place the use of 13 rather than 12 is in itself a serious disadvantage for 12 is a most remarkable number - capable of division into 2, 3, 4 and 6 parts whereas 13 is a prime number. Mathematicians even claim that 12 would have served even better than 10 in developing our whole system of numbers. The months are not divisible in either quarters, thirds, or halves except by use of the 12 month plan. To this the claim is advanced that the year may still be divided in 4 quarters of 13 weeks and the months disregarded but this of course only a make shift. Altho 13 payments would permit less capital to be used it would undoubtedly add to the cost of accounting and other expenses of doing business. A most serious objection of course is encountered where long time leases provide for monthly rentals that were supposed to be  $1/12$  of a year in considering quarterly and semi-annual payments of dividends, interest etc.

Aside from these somewhat negative arguments the 12 month plan seems to present some very real positive advantages - the quarters contain the same number of days and the same number of weeks, and the plan is

simple enough - A child would probably learn the calendar more easily than he does the multiplication table and the flat monotony of an absolutely fixed calendar - the same for each month - is really hardly desirable. The fact that the first and fifteenth would always fall on Sunday is certainly a disadvantage in the 13 month plan which would occur only four times a year in the 12 month arrangement. Further the change from the present plan to the Fixed Calendar involves no less than 29 dates which would have to be adjusted against 7 under the World Calendar - and in just this point it is believed lies the greatest advantage of the less radical plan. It accomplishes most of the needed reforms without going to such an extreme that its chances of adoption are lessened. It has been pointed out that there is no great cry from the people for any change and people in general would probably resent such an extreme change as the 13 month plan would involve whereas they would much more readily accept the sugar coated dose of the 12 month arrangement.

How to bring about such a needed reform is indeed the greatest problem in connection with this whole question. The League Committee declined to advocate any one of the three plans but suggested that organizations in each country be formed for the purpose of arousing public interest in the matter and when this had been done that possibly it might pronounce in favor of a definite plan as the result of crystalized public opinion thru out the world. Some such plan is being carried out and altho the problems of today seem to overshadow and render almost academic such discussions it is believed that the reform is on the way of accomplishment. When - Time alone will tell.