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The Duodecimal Bulletin

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THE DUODECIMAL SOCIETY OF AMERICA

Secretary, 11561 Candy Lane, Garden Grove, Cal 92640

Editor, 10 State Street, Council Bluffs, Iowa 51501

THE DUODECIMAL SOCIETY OF AMERICA

is a voluntary nonprofit organization for the conduct of research and education of the public in the use of base twelve in numeration, mathematics, weights and measures, and other branches of pure and applied science.

The forms of membership include Honorary, Life, Fellow, and Senior Members, as well as Members and Student Members. Members and Student Members are not required to pass aptitude tests in base twelve, but are encouraged to do so.

Senior membership with voting privileges requires passing of elementary tests in the performance of twelve base arithmetic. The lessons and examinations are free to those whose entrance application is accepted. Remittance of $6, dues for one year, must accompany application. Forms free on request.

The Duodecimal Bulletin is an official publication of the Duodecimal Society of America, Inc., 11561 Candy Lane, Garden Grove, CA 92640. Charles S. Bagley, Chairman of the Board of Directors; Henry C. Churchman, President and acting Editor of the Bulletin. Separate subscriber's rate $3 per year, $1 per copy.

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All figures in italic are duodecimal.

ANNUAL MEETING OF 1971 AND MEETING OF THE BOARD

The Duodecimal Society of America assembled at the Royal Inn in Boulder, Colorado, on 24 September 1971, at 0900^h. The gathering was called to order by Charles S. Bagley, President of the society. Among those present for roll call were Kingsland Camp, Charles S. Bagley, Henry C. Churchman, Eugene M. Scifres and Tom B. Linton. Among our guests were Miriam Bagley, Bobbette Linton, and Sybil Scifres.

Minutes of the last annual meeting read and approved.

Reports by Kingsland Camp, Charles S. Bagley, Tom B. Linton, Eugene M. Scifres, as officers, and Henry C. Churchman as editor of the Bulletin, were given and approved.

Balance of the forenoon taken up with a review of Anton Glaser's book, "History of Binary and Other Nondecimal Numeration", in preparation of which much effort was expended. It contains an extensive and useful bibliography. It is a book for the mathematician's library.

Recessed for lunch at the Royal Inn and again to the meeting room at *690 moments* (1330^h) to further discuss the potentialities of the TGM System prepared by Tom Pendlebury of Bedfordshire, England. The discussion was warm with regard to so many unorthodox proposals by its author, although adoption of some parts at some future time by certain sciences was not discounted. Its subdivisions of the Julian Day were seen as unmetric.

For immediate consideration of the decimal metric world, involving the least changes in methods, nomenclature and usage, M. Jean Essig's work, written in and especially for the base-ten metric world, with modest base-twelve advances and improvements in the SI methods, was regarded, in view of so many English speaking countries planning to go base-ten metric solely to achieve peace in international measurements, as most likely to capture public attention. With only a few changes, initiated or foreseen by Essig during his lifetime, his "Douze Notre Dix Futur", Dunod, Paris, 1955, was conceded to have more potentials for popularizing base-twelve counting than the Pendlebury proposals. No action at this time to adopt either.

Consideration of other business to come before the annual meeting of members of DSA was achieved by a motion by Churchman, seconded by Linton, as follows:

Resolved, that the members of DSA continue a study of comparisons of the Jean Essig units of time, money, weights, angle, and dimension with the proposed units set forth in the Dometric System by Ralph Beard, the Redivivus Reckoning by Charles

Bagley, the TGM System by Tom Pendlebury, the Metronic System by Henry Churchman, as well as other dozenal metric systems heretofore or hereafter proposed to the Society, and analyze their potentialities for advancing the dozenal base as the universal numbering system. Carried.

A motion by Tom Linton, seconded by Kingsland Camp, called upon members of the Society to undertake studies in their particular field, in which dozenal counting and measuring might be initiated with signal advantages, to prepare articles respecting their findings for publication in the Bulletin. Carried.

We need more members, young and old, to speak their piece and go on record for such reform in numerals and counting, in an area in which they feel at home, was a universal expression.

A letter from Stan Bumpus, of West Mifflin, Pennsylvania, who was unable to be present by reason of press of business, was read among happy recollections of his computer work and his report thereon at the Chicago gathering.

An encouraging letter from Honorary Member B. A. M. Moon, the Director of the Computer Laboratory at the University of Canterbury, Christchurch, New Zealand, was read and received with much pleasure and more work in dozenals will be heaped upon his shoulders.

From Honorary Member R. B. Carnaghan, of Hertfordshire, England, came an interesting, encouraging, and thought-provoking letter which was read at the annual meeting.

Recessed at nine-one-aught *(910)* moments (1810^h) for dinner at the Royal Inn, and to meet here at 0900^h tomorrow.

At *1183 September 21;460* (1971 Sept. 25, at nine A.M.) the Duodecimal Society of America was again called to order by President Charles S. Bagley.

Among those present were Charles S. Bagley, Kingsland Camp, Henry C. Churchman, Tom B. Linton, Eugene M. Scifres, and Jamison Handy, Jr. A guest also present, Petr Beckmann, professor of electrical engineering at the University of Colorado, who has authored a captivating book, "A History of π (pi)". Doctor Beckmann received his doctorate from Prague Technical University in 1955, was a research scientist for the Czechoslovak Academy of Sciences until 1963, when he was invited to become a visiting professor at the University of Colorado, where he now holds a permanent professorship. His book, at $6.30 each, may be obtained from Golem Press, Box 1342, Boulder, Colorado 80302 prepaid.

President Bagley introduced as the first order of business Dr. Beckmann, who entertained the meeting with a few well chosen anecdotes of his early career, and then compared the history of pi with a quaint little mirror of the history of man. Well received. Dr. Beckmann claims to be neither an historian, nor a mathematician, and therefore better qualified to write the story of pi.

The annual meeting of members was then recessed by President Bagley until 1971 September 26 at 0900^h.

Board of Directors Meeting.

The Board of Directors of DSA was called to order by its Chairman, Kingsland Camp, at the Royal Inn of Boulder, Colorado promptly at *1183 Sept. 21;530* (1971 September 25, 1030^h). Six directors answered to roll call, to-wit: Charles S. Bagley, Kingsland Camp, Henry Churchman, Tom B. Linton, Eugene M. Scifres, and Jamison Handy, Jr. Chairman Camp declared a working quorum present and competent to act on matters to be presented.

Minutes of the last meeting read and approved.

Chairman Camp, calling attention to his increasing years then asked to be relieved as chairman.

Motion by Tom B. Linton that Kingsland Camp be chosen as DSA Chairman Emeritus was seconded by Jamison Handy, Jr., the question was put by President Charles S. Bagley as temporary chairman and carried.

Election of Officers

Charles S. Bagley was nominated by Henry Churchman as Chairman of the Board to succeed Kingsland Camp, seconded by Eugene Scifres, who moved that nominations be closed and that the Secretary be instructed to cast the unanimous vote of the directors present for the motion. Carried.

Chairman Camp called for nominations for President. Henry C. Churchman was nominated by Jamison Handy, Jr., seconded by Eugene Scifres, who moved that nominations be closed and that the Secretary be instructed to cast the unanimous vote of the directors present for the motion. Carried.

Tom B. Linton was nominated by Charles S. Bagley to be the Secretary of DSA, seconded by Henry Churchman, who moved that nominations be closed and that the Treasurer be instructed to cast the unanimous vote of the directors present for the motion. Carried.

Eugene M. Scifres was then nominated by Charles S. Bagley to be Treasurer of the Society, seconded by Tom Linton, who moved that nominations be closed and that the Secretary be instructed to cast the unanimous vote of the directors present for the motion. Carried.

The Chairman of the Board then appointed Henry Churchman as Editor of the Duodecimal Bulletin. Board concurred.

Election of Board Members

It appearing that Charles S. Bagley and Ralph H. Beard are in the Class of 1971, whose three year terms expire this year, it was moved by Henry Churchman that Ralph H. Beard and Charles S. Bagley be nominated for three year terms as members of the board, class of *1186* (1974), seconded by Tom Linton who moved that nominations be closed and that the Secretary be instructed to cast the unanimous vote of the directors present for the motion. Carried.

There being two vacancies on the board in the class of *1186*, it was moved by Tom Linton that Robert H. McPherson be nominated for a three year term as a member of the board, class of *1186* (1974), seconded by Charles Bagley who moved that nominations be closed and that the Secretary be instructed to cast the unanimous vote of the directors present for the motion. Carried.

It was then moved by Tom Linton that Paul Beaver be nominated for a three year term as a member of the board, class of *1186* (1974), seconded by Jamison Handy, Jr., who moved that nominations be closed and that the Secretary be instructed to cast the unanimous vote of the directors present for the motion. Carried.

New Business

Motion by Eugene M. Scifres, seconded by Kingsland Camp, that Ralph H. Beard be appointed chairman of a committee to report at the next meeting a plan to initiate a Duodecimal Academy, or Academie Duodecimale, to be composed of our members, honorary members, and others occupied as professors of mathematics, heads of departments or in such professional or computer activities concerned with an efficient system of numerals and a number system to be employed by the common citizen as an improvement over the base-ten system of measures and counting; and he is authorized to select suitable members to serve on this committee. Carried.

There appearing to be some international need for study of what might be considered the most desirable symbols and names for the two additional numerals representing 9 + 1 and 9 + 2, looking towards a possible international agreement upon those terms and symbols; and in view of the worldwide introduction by Bell Telephone System of its own symbols of ✳ and # for use of its subscribers around the earth (and the need, telephonically speaking, to avoid the names of "ten" and "eleven" for reasons of certainty of understanding in connecting two or more customers), it was:

Moved by Tom Linton, and seconded by Charles Bagley, that Kingsland Camp be appointed as a committee of one to investigate and report to the board by 15 January 1972 his findings with respect to this matter, as well as the possible use of the Joe Celko base indicators of any numeral in any radix; and the further use of the Humphrey point (;) to suggest the base of twelve exclusively, whether or not the numeral be underscored or written in italic script or boxed within a rectangular enclosure or be prefixed by an asterisk or other symbol. Carried.

In view of the special qualifications possessed by Stan Bumpus of Pennsylvania, it was moved by Tom Linton and seconded by Charles Bagley that the Chairman appoint Mr. Bumpus as a committee of one to draw up plans and map the strategy for developing the increasing interest of students in the high school and college levels in both learning and advancing the dozenal method of counting, especially in computer fields. Carried.

The board chairman will coordinate these activities and inform other members of the board on progress attained, until the next annual meeting when Mr. Bumpus may make his own report.

Moved by Linton, seconded by Scifres, that the Board adjourn sine die. Carried.

At *960 moments* (1900h), the Annual Banquet of The Duodecimal Society of America was begun in the delightful dining room of the Royal Inn at Boulder, Colorado, with members and guests all present for a pleasant interchange of dozenal speeches and talk about food. Not a word was mentioned about base-ten or money.

Closing of Annual Meeting

At *1183 Sept 22;460* (1971 September 26, 0900h) the annual meeting of the members of The Duodecimal Society of America was called to order in The Royal Inn at Boulder, Colorado, by Charles S. Bagley as president.

The minutes of the meeting of the Board of Directors of yesterday were read and announcement of the election of members of the board of directors, Class of *1186* (1974), as well as the selection of officers of the Society for the ensuing year and until their successors are elected and take office, was made to the membership.

It was moved by Kingsland Camp, seconded by Jamison Handy, Jr., that the actions of the board of directors as disclosed to the members here assembled, including the selection of officers and board members, be approved in each and every respect. Carried.

Kingsland Camp thereupon turned over the gavel to his successor, Charles S. Bagley, as chairman of the board; and Charles S. Bagley declared Henry C. Churchman the newly elected president of The Duodecimal Society of America.

Kingsland Camp announced his acceptance of the chairmanship of a committee to study possible changes in names and shape of the DSA symbols for 9 + 1 and 9 + 2 and possible enlarged use of the Humphrey point, as well as possibilities of the employment of the Joe Celko subscripts as base indicators, and will make a report of his findings to the board by 15 January 1972.

Discussion was in order for a place of meeting in 1972 and it was moved by Eugene Scifres, seconded by Charles S. Bagley, the time and place of next annual meeting of the board and members be studied by our Secretary, Tom Linton, and a timely announcement made to the membership. Since the matter is wide open, it is suggested that a member or members of the society in the areas which might appear to have been overlooked in the past get in touch with and make timely suggestions to our secretary.

There being no further business to come before the membership meeting, it was declared adjourned sine die. Whereupon members headed north, south, east, and west, and some inclined towards the beautiful mountains from a Boulder approach, where indeed a bolder approach to dozenals might be conceived.

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BOULDER CONCEPTS:

General George Patton, in World War II, demonstrated not only that the best defense is the counterattack (as Marshal Foch had shown in World War I), but that a bold breakthrough to paralyze and separate the arms from the brain (the rear command post and its orthodox feeling of protected security and complete freedom to maneuver its reserves to bolster weaknesses in its front line) is the best way to bring a war to a successful conclusion favorable to our side of the contest.

During a battle in the American Civil War the aide of an army division commander, alarmed by reports that the enemy had completely separated the division from its supply lines, disclosed the predicament to his chief. That fearless commander sized up the situation from another point of view, noting that apparently the enemy was now completely shut off from his own supply lines and every advantage should be taken of that situation to proceed to choke him. Again dramatized in World War II by General Anthony McAuliffe's reply when the enemy pointed out a complete encirclement and demanded a surrender: "Nuts!"

Fear not when you are surrounded by the enemy. You have all the advantages of compactness and could irritate him beyond his capacity to bear. In close combat, victory goes to the audacious, and lend-lease often comes to help in modern logistics.

Britain, South Africa, Australia, New Zealand, and Pakistan are still fighting a holding action. It is within a possibility they might succeed in retaining their inches, pints, and the ounce avoirdupois. But to mount a counterattack, in view of their loss of troops, seems entirely beyond reality, although nothing in life is certain.

The Duodecimal Society of America was not formed to yield under pressure its mission to educate. Nor was it set up to bow down before the gods of the decimal crowd. It will never relinquish one scintilla of an intensive educational drive to ensure that base-twelve will pervade all things while the world struggles into the upcoming century. Base-twelve is the hope of the world as we know it today; our modern Dark Ages need light!

Accordingly, we do not intend to stand as targets to be shot down by those having the most money and mercenaries at their command. Rather let us separate their commanders and those in their service from the security which sustains them. Are they in favor of a change? So are we. Do they prefer a metric system? So do we. Are pints, pounds, and yards vulnerable? Yes. (And so are decimetric litres, kilogrammes, and kilometres.) Are all new metrics to be put in books, in schools, in the hand of teachers, in the mind of the child? Undeniably so. Let's get in there for Terry's sake! And win one for Essig, too!

Enjoy metric time. Not twenty-four, or ten, but twelve divisions of the Julian Day, the easiest thing in the world for a child to learn. Two is called two---not ten. Three is called three---not fifteen. Simple and forthright. No more ten hundred hours, which indeed are NOT ten hundred hours at all. Alice in Wonderland in an unreal Twentieth Century!

H.C.C.

A DUODECIMAL CALENDAR

By Robert Davies

The day and the year are the only astronomical time intervals of importance in designing a modern calendar. If a duodecimal calendar has a dozen days in one "week" and a dozen weeks in a "season", then the first two seasons of a year are each a gross of days long, and the third or last season is *65* or *66* days long.

Selecting the Julian Day number zero as the first day of the calendar obviates using negative years for almost all of recorded history. A Fortran program translates between Julian Day number, duodecimal date, and Julian or Gregorian date.

BACKGROUND

Selecting the optimum counting base is one of the first decisions that must be made in designing the ideal background for a new culture. Indeed, it may be THE first. Other decisions, such as the determination of the semantics and syntax of the language, the selection of the music scale, and the design of a calendar, all depend on the counting base---but not conversely.

This paper presupposes that the optimum counting base is duodecimal and presents a calendar based on that fact. One must examine each attribute of existing and historical calendars to see which are germaine today and are needed in an ideal calendar and which are obsolete and need to be dropped. Only by such careful examination can one avoid a mistake like Napoleon made when he adopted the base-ten metric system.

The length of the mean solar DAY is a fundamental time interval in human life. The day is so important in human activities that no apology is given here for its inclusion as a subdivision of the calendar.

The length of the tropical YEAR is not so important in human life. The early calendars that recognized the year evidently did so because of the annual cycle in the weather. Even in tropical regions that had little change in temperature there were rainy and dry times and rivers overflowed their banks. The annual cycle in the weather directly caused annual cycles in food production, both hunting and agricultural, and indirectly through those influences caused annual religious cycles. Living style and trade, where trade existed, also cycled annually, cycles which were produced both directly by the weather and indirectly by the influence of weather on food and transportation.

Today these reasons are not valid for considering the year to be an essential division of the calendar. However, weather is still an important factor in our lives, even though we have largely mastered it, and it will continue to be important until we finally control it. Therefore, for convenience in relating date and probable weather, both in the past and in the future, this new calendar preserves the year as an important time interval. Doing so may be a bad decision. The major disadvantage to keeping the year is the inconvenient number of days in a year.

Other calendar intervals do not here occur because they are thought to be not important today: the week, the month, the season, the decade, the century, the millennium, the epact cycle, the dominical letter cycle, and so forth. Some of these words---"week", "month", and "season", are used here to refer to different intervals of time than now customary.

PATTERN OF LEAP YEARS

A simple leap-year distribution exists for a duodecimal calendar which quite accurately approximates the *265;2XX63* days in a year. The rules are:

1. Every fourth year is a leapyear containing *266* days excepting---

2. Once every gross of years a leapyear day is omitted, and,

3. Once every eight gross years another leapyear day is omitted.

The first two rules are similar to the rules for the Gregorian calendar, namely, the year is a leapyear if the remainder is 0 on dividing the year number by 4 (congruent to 0 modulo 4) but is not a leapyear if the remainder is 0 on dividing by *100* (congruent to 0 modulo *100*).

In the case of the Gregorian calendar, 100 years is one century (*84* years) and too many leapyear days are removed; therefore, one has to be returned every 4 centuries.

In the case of the duodecimal calendar, *100* years are a gross of years and too few leapyear days are removed; therefore, another one has to be removed every eight gross years (rule 3 above). The years from which leapyear days are to be removed because of rule 3 should be the years congruent to *60* modulo *800* so that they are the years halfway between years to which rule 2 applies.

To summarize:

Duodecimal Calendar

Modulus	Congruent to	Leapyear
8 gross years	*60*	No
1 gross years	0	No
4 years	0	Yes

Gregorian Calendar

Modulus	Congruent	Leapyear
4 millenniums	0	No
4 centuries	0	Yes
1 century	0	No
4 years	0	Yes

The first condition given in the table above under the Gregorian calendar is not a part of the original Gregorian calendar. Some people add the convention to bring the calendar into closer agreement with the length of the tropical year. The lengths of the various years are:

Length of the tropical year	*265;2XX63*	days
Length of the Julian calendar	*265;3*	"
Length of the original Gregorian	*265;2XƐ06*	"
Length of the modified Gregorian	*265;2XX74*	"
Length of the duodecimal calendar	*265;2XX6*	"

The error in this duodecimal calendar is 0;*00003* days per year. The error in the original Gregorian calendar is *0;00063* days per year and in the modified Gregorian calendar the error is as much as *0;00011* days per year. One must realize that all three of these errors are quite small---one day in 4 millenniums (ca. *2400* years).

SUBDIVISION OF THE YEAR

The *265* or *266* days of the year are too numerous to keep track of handily and at least one interval or grouping of time between a day and a year is needed. There is no clear-cut or optimum solution to the problem of subdividing the year into intervals in the sense that there is a good solution to the problem of distributing leapyears. This paper presents three possible examples of how to subdivide the year and recommends the first as possibly superior to the other two. A discussion of how to look for other subdivisions precedes the examples. It seems impossible to list systematically all possible subdivisions.

The prime factors of *265* are *5* and *61* and of *266* are *2*, *3* and *51*. Sixdo-one and *51* are both too large for groupings, that is, *61* or *51* days in a unit of time are too many to keep track of without some other subdivision. A factor table shows that *260* is the closest number with no large prime factors. Its prime factors are three 2s, two 3s and 5. The nearest number with only the prime factors of a dozen is *300 (57* more than *265)* with prime factors of four 2s and three 3s. Existence of *260* with such small prime factors only 5 or 6 days away, and the nonexistence of any other number reasonably close with small factors, causes most dividing schemes to end up with 5 or 6 extra days with a subdivision of *5* or *X* members somewhere.

There are the following alternatives for calendars:

1. Do not use the year as an important division of time.

2. Do not require that the calendar for each year be the same, e.g., that a particular day of the month always be the same day of the week.

3. Do not require that all the time intervals be the same, e.g., not all months the same length.

4. Permit some days to be outside the usual time intervals, or repeated, such as the Julian sextile and bissextile days.

The Gregorian calendar uses alternatives 2 and 3; nevertheless, use of any one alternative is sufficient. Most proposed calendars use alternative 4 and have a "Year Day" and a "Leap year Day" which are outside of any week or month; or a Seventh, Bi-seventh, and Supplemental-seventh day, all part of "the long holiday" in a single week. Two of the calendars proposed in this paper use alternative 3, placing all unique time intervals at the end of the year.

One logical procedure with a duodecimal counting system is to divide time into intervals, or "weeks", or a dozen days each with one shorter interval at the end of the year. Primitive tribes, when they engaged in trade, usually grouped their days into intervals as long as the time between market days, between four to dek days, indicating that a dozen days may be too long an interval for a "week." There is much to say for a six-day week calendar, and the differences between it and the dozen-day week calendar are developed in this paper. However, for the first proposed calendar, a week is taken as a dozen days for two reasons:

(a) It is easier to convert a dozen-day week calendar to a six-day week calendar than conversely.

(b) It is easier to designate the day and week when subdivisions are made equal to the counting base.

DOZEN-WEEK SEASONS

A dozen weeks can be combined into one "season" which is then one gross days long. That length is nearly five conventional months and there are approximately 2½ seasons per year. The 3rd or last season of the year has only six complete weeks plus an incomplete week of five or six days. Note that the extra five or six days have cropped up in this example. Note also the occurrence of *2;6*, one half of 5 and a factor of *260*. For further convenience, a gross-day season can be divided into three or four "months" which are then about as long as either seven or five conventional weeks.

An integer *0* through *Ɛ* can be assigned to each of the dozen weeks of a season. The integers 0, 1, and 2 can be assigned to the three seasons. If the days of a year are numbered consecutively from *000* through *264* or *265*, then the rightmost character tells the day of the week, the middle character the week of the season, and the left character the season of the year. So much for the calendar based on dozen-day weeks and dozen-week seasons.

GROUPING BY SIXES

Six-day weeks can be grouped into six-week "months" of *30* days each. The year then consists of dek "months" plus the five or six days left over. The five or six days left over can be treated as a short eleventh or elth month. Trying to subdivide the dek "months" into seasons encounters the ubiquitous problem of having five units in some subdivision. Alternatively, a dozen six-day weeks can be grouped into a season which is *60* days long, or about dek of our conventional weeks. There are five such seasons in the year followed by five or six days. In any combination of six- or dozen-day weeks and six- or dozen -week months or seasons, the day number correspondence mentioned can be preserved by not numbering the days consecutively. For six six-day weeks in a month, for example, *005* must be followed by *010* and *055* by *100*. These three calendars, a dozen day week and six week season, a six day week and six week month, and a six day week and a dozen week season, are all considered as just one example.

The table below lists all ways that days can be grouped into weeks, weeks into months, months into seasons, etc., using the factors of a dozen. The four calendars mentioned up until now are represented by *10, 10, by 10, 6, by 6, 10, and by 6, 6*. In

order to shorten the table, *6, 10* is not listed because it is equivalent to *10, 6*. Also 2, 2 is not listed since it is equivalent to 4.

	Days left over		Days left over		Days left over
3,3,3,3,3	*X2*	*6,4,3,3*	*105*	*10,3,3,2*	*105*
4,3,3,3,2	*105*	*6,4,4,2*	*125*	*10,3,3,3*	*35*
4,3,3,3,3	*35*	*6,4,4,3*	*65*	*10,4,3,2*	*65*
4,4,3,3,2	*65*	*6,6,3,2*	*105*	*10,4,4*	*125*
4,4,4,3	*125*	*6,6,3,3*	*35*	*10,6,3*	*105*
4,4,4,4	*91*	*6,6,4,2*	*65*	*10,6,4*	*65*
6,3,3,3,2	*35*	*6,6,6*	*105*	*10,10,2*	*65*

One can use the table to study all alternate regular subdivisions of the year, if one does not accept my recommendation of a dozen days per week and a dozen weeks per season. The table does not include irregular subdivisions, and it may be too bulky to try to list all possible irregular subdivisions. An example of an irregular subdivision is:

1. Divide the year into four seasons of *77* days each plus one day not in any season.

2. Divide each season into 3 months of *26* days each plus one day not in any month (note how the five extra days have been taken care of).

3. Divide each month into 5 weeks of 6 days each.

THE FIRST YEAR

Astronomers and some historians use Julian Day numbers to keep track of elapsed time. Julian Day number zero is January 1, 4713 B.C., and the days are numbered consecutively since then. We are now at about Julian Day number *999000*. Julian Day number zero ought to be taken as day zero, year zero in this duodecimal calendar. If that be done, November 21, 1972 becomes *3X50/265* and November 22, 1972 becomes *3X51/000*. The Julian Day numbers for these two days are *998ƐX3* and *998ƐX4*.

There is little connection between the "Julian" in Julian calendar and in Julian Day number. The Julian calendar, of course, is named after Julius Caesar. Julian Day numbers were named by Joseph Scaliger (1540-1609 or *3750-37X9*), who developed the concept, after his father.

Julian Day number zero is so far back in time that it precedes nearly all of recorded history. The First Dynasty in Egypt, for example, was about *1000* years after Julian Day number zero and the first dynasty in Ur was about *1300* years after zero. Consequently, negative years (B.C.) almost never have to be used for recorded history and one avoids the trouble of calculating the elapsed time between a B.C. date and an A.D. date, and also the confusion of the reversed number sequence for the years before 1 B.C.

It is proper to count the years from zero. Note that by counting the days of the year from zero, it is possible to have a correspondence between the different characters of a day's number and its position in its week and month. Had we not called the first day of the week zero, we would have run out of single characters before getting to the dozenth day.

The year should be written before the day, as in *3X50/265*, because in all other measurements the larger unit is given first. Consider, for example, the use of such expressions as miles, feet, and inches, or degrees, minutes, and seconds, or pounds and ounces.

The first of the year has drifted to the latter part of November because of the error in the Julian calendar. Joseph Scaliger evidently did not realize the size of the error in the Julian calendar when he set up his Julian Day numbers. Julian Day number zero, however, did occur when the earth was in the part of its orbit that it now occupies in November. There is nothing sacred about the time our conventional year ends---- it is neither the winter solstice nor the time of perihelion--- and the latter part of November is just as good.

COMPUTER PROGRAM

A computer program exists to calculate dates on this dozen-day week, dozen-week season calendar. There are four quantities:

Date in conventional calendar	Decimal Julian Day Number
Date in duodecimal calendar	Duodecimal Julian Day Number

The program permits *any one of these four quantities* to be entered and then it provides the other three. It uses the modified Gregorian calendar in which the years that are integer multiples of 4000 are not leap years. This program interprets October 4, 1582 as the last day on the Julian calendar and the next day, October 15, 1582, as the first day of the Gregorian calendar. This transition date can be changed easily as described in the program's comments (not included here). It uses some concepts from "Conversions between calendar date and Julian Day number," Algorithm 199, Communications of the Association for Computing Machinery, Volume 6, Number 8 (August 1963), by R. G. Tantzen. The program is written in ANSI Standard Fortran.

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(A 7-page copy of that program may be obtained free from the author by writing to him at 1601 Kirkway, Bloomfield Hills, Michigan 48013, while the supply lasts. ---Editor.)

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A paper towel U.S. manufacturer (Bounty) is advertising and marketing today what it calls "Fast absorbing . . strong for tough jobs, 100 Sq. Ft., 120 TWO-PLY SHEETS - - 11 x 11 IN." If the U.S. Congress would authorize permissive use of a duodecimal metronic system, this might change nothing but the following words: "ONE SQUARE NUFUT".

POST MERIDIAN ON THE POTOMAC?

Henry Clarence Churchman,
a Fellow of The Duodecimal
Society of America.

This is the beginning of an approach to a study of the youth, the vibrance, the intelligence, the world leadership of today's people in these fifty States of America, in the middle of the second half of the 20th Century. Are we still leaders of innovation or are we tired of leadership--are we whipped, after but 200 years of a normal 1000 years life expectancy, into a condition where we would rather follow others?

There was a time when Americans were young, inventive, active and daring, even while we claimed to have a decent respect for the opinions of other nationals. The Continental Congress recognized this view in many ways, only three of which are treated in this brief glance at history.

DECLARATION OF INDEPENDENCE

In 1776, when Jefferson was directed to draw up a declaration of our dissatisfaction and when the Congress adopted this in final form as the Declaration of Independence, on July 4, 1776, we demonstrated our youth and innovative thinking, especially when we did not stop with remonstration against our ill treatment but went much further than expected by some members of the Congress and declared our independence of our own government. At the same time we publicly said some nasty things about our head of government, the English king. Great daring here was demonstrated by a majority of members of the Congress, the representatives and the leaders of the people. Individual rebels could have been hanged within twelve hours of arrest.

NORTHWEST ORDINANCE

Again, in 1787 although another government claimed ownership, the Continental Congress did not hesitate to disagree but made provisions for the description by surveyors of virgin lands lying beyond the Charter boundaries of the former Colonies, particularly north and west of the Ohio river. (Jefferson, years earlier, had defined the boundaries of twelve additional states within this territory and suggested names for each, one of them being today's Michigan).

That Act of Congress became known as the Northwest Ordinance of 1787, and its measurements were later to apply also to lands added by the Louisiana Purchase of 1803, by the War with Mexico in 1845, and the land purchased from the Czar of the Russians in 1867, now known as the State of Alaska, our largest in area.

As a relevant idea, please call to mind that as early as 1787 Americans, in surveying lands, thought in terms of dozens, not alone twelve pence to the shilling, twelve inches to the foot, but three dozen "sections" of land in each Congressional Township, one gross Sections in each four such townships. The land in each township therefore might be divided, like the shilling, into equal halves, thirds, quarters, sixths, dozenths; and the Sections into halves, quarters, eighths, and sixteenths---the latter described commonly as "forties", the equal of 40 acres of land in central and western Canada and the U.S.A. today.

MONEY

A flare of daring was again exhibited by the Continental Congress when, contrary to the thinking, habits and customs of all Europe and of all nations with which the U. S. was then engaged in commerce, we set up a new monetary system, based not on the dozen or the score of pence or shillings but a system wholly related to the base-ten system of counting---a "dollar", stolen (taken without a simple "By your leave") from the Dutch "thaler", was to contain ten dimes (or dismes), and each dime was to be the equal in value of ten pennies.

Each penny in turn was to equal the value of ten mills. Accordingly one dollar was to be the equal of ten dimes, one hundred pennies, or one thousand mills. The mill was never coined but many tax levies were to be figured even to this day in tiny mills----the millage levy, which scarcely anyone understands to this very moment (until the dollar sign is placed before a substantial sum of money).

It is hardly possible today to realize the courage displayed by the Continental Congress in breaking with all other nations, friendly or otherwise, to set up a monetary system entirely divorced from the dozen-base, employing terms and values absolutely unknown to the scholarly people of any nation, their governments, their merchants, to visitors within our gates, and even strange to our own merchants and people. The dollar itself approached the value of the Spanish peso or eight bits employed in the South and West---hence, today, a quarter-dollar is still called two-bits in American slang but we do not mint a bit.

The daring Alexander Hamilton, later Secretary of the Treasury, engineered this move. It never could have been done by a nation conditioned to follow the customs, habits, and thinking of other peoples. In international financial circles we just stood there alone, by ourselves, upstarts, brats, show-offs. Thomas Jefferson pushed it through the Congress.

Within ten years the people of France had followed our example (as human beings tend to imitate you), threw off their king and wasted him, after which they boldly set up a new monetary system patterned, like ours, on the base-ten system of counting. So much for past courage, in this effort to understand.

FRENCH METRIC SYSTEM

France did not stop with a base-10 new monetary system. Anxious to break spectacularly with its monarchal past, it attempted to outdo America not only by applying base-ten counting to money but to dimensions, and her people moved to introduce the base-ten to calendars, measurement of angles, circles, spheres, diurnal time, and other wholly unsuitable fields of human comparison, from all of which they had to more or less withdraw as time proved the incapability of base-ten to improve these systems over what little we had already developed.

Today, in all so-called "metric" nations and even in college-level textbooks in the U. S., diurnal time is still measured by periods of the hour, minute and second, with compound admixture of tenths, hundredths, thousandths and millionths of the second (which is not a base-ten but base-twelve part of a day---one of some four-dozen-and-two greatgross parts). Consequently, one millisecond of time bears a compound denominate number relation to 1000 Julian days---not at all metric in concept or practice, as you know.

One might as logically take a dometron and divide it into ten equal parts, or a current French meter and create twelve equal subdivisions---a hybrid disease which afflicted pence, shilling and pound sterling upon which Hamilton applied the scalpel with spectacular effect. He removed the dozen when good surgical practice might have pinpointed the ailing ten base.

AMERICAN METRIC SYSTEM

Today it is being suggested that a wise employment of base-twelve might not only adapt our inch, foot, and mile to one Dominante unit of length (a dozenal unit equal to ONE great circle of the earth), but this base-twelve counting might enable us to divide one Julian day not only into a dozen equal parts, again, again, and again, down to the "Moment" (50 seconds of time exactly), but also to reach down to a dozenal unit of time finer than 1/100 000 000 part of a second, all in base-twelve units; rising thence through Julian days to more than one completed precession of the equinoxes (each equal to about 25,800 years). A circle may be divided in the same manner for navigators, astronomers, artillerymen, as well as the world's postal systems to effectuate a worldwide zip code.

The traumatic effect upon the American people of our change from miles to kilometres might be considerably reduced. Please note that in the dozenal metric system of counting we might retain the 0.1 statute mile now found on all licensed U. S. motor vehicle odometers, a dozen of which might be considered the equal of Essig's French suggested "kilomètre duodécimal", or the AEROMILE; also known as 1.2 Canadian miles in terms of today.

Too, in that dozenal metric system of counting we might find a full Section of farm lands or farm crops in every hundred of Monsieur Essig's "hectares duodécimaux" (each 0.1 mile squared) ---making it feasible for the U.S. Department of Agriculture to add up "Gardens" of growing corn, wheat, beans, etc., by such hundredths of sections of land to equal thousands of Canadian square miles, and downwards by *percent* of the present Section of lands or crops in the United States.

In the base-twelve metric system of counting, one gross Sections of crop lands might be said to equal four Congressional Townships (one-fourth of an Iowa typical county), as defined by the Continental Congress in the "Northwest Ordinance of 1787" in that year, which rules still constitute the lawful method of measurement of all Midwest and Western farm lands in the U.S.A.

WHICH WAY TODAY

In apparently powerful positions in the Executive Departments of our government today (1972) are persons (exclusive of political appointees) who for one reason or another, and some without any reasoning, are ready to yield up our old qualities of youth, vigor, innovation, and leadership---they would appear to be tired old men. There is not a Washington, Adams, Jefferson, or Franklin among them. Perhaps they should be retired at age thirty-five----in thirty years they could set the nation behind our contemporaries at least 200 years in adopting an improved metric system.

Although confronted by a base-ten metric system which clearly is incapable of describing time, angles, coinage, spheres, circles, or indeed the simple E-Z worldwide zip code pointing (in only ten places) to any spot on earth or sea or the air not more than 0.1 Canadian mile north or east of another, those people nevertheless would put that base-ten metric system, if they could, in the prime position of all U. S. measurements. They would waste our forefathers' empiric inch, foot, and mile, all for a compulsory use of an incompetent ten-base metric system of measures, because, so they say, the latter measures are "worldwide", "universal", "enjoyed by all mankind excepting the backward nations of Canada and the U.S." So once was Latin, or the universal ridiculous belief that our earth is flat.

On the other hand, there are still young, vibrant, daring, knowledgeable, imaginative leaders in America, who (even as Alexander Hamilton introduced a base-ten currency system to the world at a time when the "whole world" employed a compound dozen and score to count their currencies) would dare to put the U. S. first in setting up a pure base-twelve monetary system, simply because it provides better divisions of our dollar.

One dime, in base-twelve the equal of twelve pennies, could be divided into 2, 3, 4, 6, or 12 equal parts and whole coins given in change when required---the true purpose of any coinage system. Too, the recurrent suggestion that we should mint a half-cent coin could be forever laid to rest.

Some persons think Hamilton, implementing a base-ten monetary system, erred, and misled the European world. Let us sincerely repent. In adopting the 21st Amendment of the U. S. Constitution, Americans were not afraid to correct their 18th Amendment when they saw the unworkability of prohibition; and a bold Secretary of the Treasury just might recommend to Congress a base-12 improved coinage system today---even though in doing so we once more stand alone among nations. It need not be POST MERIDIAN ON THE POTOMAC---our sun is rising for the next 300 years at least, I beg you to believe. You can change America--America might again change the world.

ESSIG'S DUODECIMAL KILOMETRE IN RELATION TO NAVINAUT

Lawrence Boythorn

M. Essig's duodecimal metre never should be labeled as tied to the length of 40,000,000 base-ten metres (equal to NO great circle of the earth). Actually he employed those units familiar to Frenchmen to teach them dozenals and to illustrate his system as we indeed employ yards and pounds. His "24-heures" were abandoned as he moved to a uniform one-twelfth mean solar day suggested for all by British Admiral G. Elbrow. Essig was a brilliant thinker and a diplomat, too. No duodecimal principle was sacrificed by him in moving towards a common goal.

An equatorial radius of 6,378,160 m., accepted today, is 228 metres less than that accepted as exact less than a dozen years ago.[1] We might find ourselves in the position of the French savants who attempted to determine the "smallest" quadrant of the earth---and came up short. *We could seek the "largest" great circle and come up too long.*

Since the equatorial radius is greater because of centrifugal force countering physical attraction, it would seem that this radius might lessen as the earth's rotation slows. The Eastern shores of the U.S.A. and the California shores abutting Pacific Palisades are said to be now slowly sinking into the sea, but possibly it is the sea level rising as centrifugal force lessens at the equator and the water moves elsewhere.

Conceivably the polar radius might for the same reason be growing larger. It is now believed that men and mastodons (Mammut americanum) once walked on dry land between Asia and America where the surface of Bering Strait now covers all but the Big Diomede and Little Diomede islands.

It goes without saying that ever since Sir Isaac Newton first defined gravitation, all metrological systems have attempted to measure the variations of that attraction at innumerable spots around the earth, and still continue to do so. In none of them is there an exact duplication of the equator with the poles. Variations from pole to pole are found not only because of centrifugal force but as well by any odd placed element beneath the surface---and differences may be expected.

Length of lightwaves remain constant and might be embraced by all metrologists eventually. The [2]metronic unit of *75 000* wavelengths of orange-red krypton 86 light is never indefinite or variable in different parts of the world.

Let us avoid such unscientific dimensions as "high as the mountain" or "deep as the sea." We approach the unreal if anyone were to suggest that a jet, even if it possessed all of the qualities of a submarine, might drop lower than the bottom of the North Sea and surreptitiously cross the Equator some ten kilometres beneath sea level just to describe the path of a meridian perfect circle. Theoretically, every great circle is perfect but over eleven-twelfths are more or less elliptical.

One [2]Dominante dimension, tracing any meridian *a like and* *continuous height above sea level at the equator and at the poles* (about 36,000 nufut are suggested) might measure the true flight of a jetliner circumscribing the earth in a north-south-north direction only.

If a jetliner (no such commercial route now exists) were ever to fly east or west around the earth at the Equator, let us imagine at 48,000 [3]nufut, such path might of course register dozens of [4]Navinauts more than the length of one Dominante dimension. And the higher the altitude, the greater the increase in length of such orbit. But on any circumnavigation of the earth at least 48,000 nufut above sea level, one may be guided by angle measurements, not metre, as often as not.

If the length of one dometron be said by anyone to equal the sum of 44.014 471 English inches (1 nufut by definition might then equal 11.003 618), the mètre duodécimal, and its fourth part, should be given the same numbers. Authority? Read notes (1) and (2) at the bottom of page 105, "Douze Notre Dix Futur", 1955, Dunod, Paris, which dictate the length of Essig's kilomètre duodécimal, not unlike the Navinaut of Charles S. Bagley[4] too, as the equal of "un arc d'une nouvelle minute duodécimal." This is the arc of 62½ seconds of angle of ONE great circle of earth, or one edomo *(0;0001)* part of such circle.

One-twelfth of such dozenal new minute arc is nearly 1/3000 greater than the 0.1 Canadian statute mile. How remarkably accurate our great English mathematicians computed the size of our globe in a base-ten age of arithmetic! Let us never cease to honour them, amongst the unknown soldiers of history.

At the bottom of p. 106, in the same book, M. Essig forecasts the replacement of the bar kept in the Pavillon de Breteuil, by a given number of wavelengths---"a selected wavelength." This came within 6 years, wavelengths of orange-red kr. 86 light being selected as the most practical.

During his lifetime, M. Essig modified his unit of time, and dropped the Prime for the egromo *(0;00001)* part of the mean solar day---some call it the "Dot" but names are not important.

In the May 1957 Bulletin, p. *7, X,* et seq., M. Essig writes: "I took that opportunity to ally myself with a new time measurement system which some correspondents had suggested to me---dividing the day into twelve 'bi-heures'. The basic unit of time would thus be the second---the *10 000th* part of the bi-heure, or *100 000th* part of the day, in duodecimal numeration of course, and no longer the 'prime' that I had imagined."

And on p. Ɛ, same issue: "Already our angle units are the same; . ." Same page: "Thus we can ask it (U. S.) to improve its basic unit of length---where our agreement is not yet perfect---but not to adopt one currently existing, whether meter or foot . ." and "As I have said, it is necessary---and I here agree with your Chairman Andrews---to seek a new basic unit, simple and incontestable for all. I think that the one I proposed, the *10 000th* part of the terrestrial circumference in duodecimal notation (as the kilometer as well as the nautical mile---an enormous advantage, susceptible by itself of rallying many adherents), would be very attractive, and one to which you could adhere." This is accomplished in the Navinaut, the Nante and the kilomètre duodécimal---identical triplets. The Dometron and the Duodecimal Metre therefore must be the same dimension in relation to each other too.

Again on p. Ɛ: "It would result in a new meter a little longer than the present one (about 44 inches), and the third or fourth of which---factors that we have to like----would be near your present foot. Thus we will be intelligent, and we will obtain an unanimous agreement."

Accordingly one might say that the nufut was suggested by the dozenal student, M. Jean Essig, a quarter of a dozenal fraction (12^{-3} x 1/4) of the Navinaut or Nante or kilomètre duodécimal.

The least misconception by any dozener anywhere indicates, of course, a failure on our own part to bring the dozen to an interested world. Every day in every way dozeners are pulling together with the great internationally oriented Andrews-Elbrow-Beard-Essig-Bagley concessions, requiring the least move for Europe and the Anglo-Saxon world too---an example of the natural law of attraction of matter (gray matter in this case).

It is possible, of course, that the Russians or the Chinese, second in vying for world leadership and therefore trying harder, might adopt a complete dozenal metric system ahead of both Europe and America (see p. *48*, December 1966 Bulletin and p. *25* of April 1970 Bulletin for straws in the wind).

[1]Encyclopedia Britannica 1968 publication, Vol. 7, on p. 847, we find: "Earth, equatorial diameter 12,756,776 m. (radius accordingly 6,378,388 m.). Polar diameter 12,713,824 m. (radius assumed therefore to be 6,356,912 m.).

[2]In the October 1962 Bulletin, p. *18*, the dimension of one Dominante unit of length was defined by Henry Churchman as the equal of seven-five-gro tri-mo, shown *7 500 000 000 000* (the twelfth power of twelve, times 7-5/12) wavelengths of orange-red Krypton 86 light---ONE Great Circle of the Earth.

[3]April 1970 Bulletin, p. 4, for definition of length of nufut.

[4]Aug. 1958 Bulletin, "Redivivus Reckoning", Charles S. Bagley, for dimension of one Navinaut.

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With typical British understatement and New Zealand modesty, the authors of "MORE ON BASE CONVERSION ALGORITHMS", p. 7, Apr. 1971 Bulletin, are shown as saying: "The following algorithm, while obviously not conferring any advantages over former methods, does perhaps indicate the variety which may await discovery." It might be more factual if it were to read: "while not obviously". Try re-reading that excellent proposal with this change in sequence of these two words, as it should read. --Ed.

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VALUED LETTERS FROM READERS---

T. PENDLEBURY, 68 Maulden Road, Flitwick, Beds., England, writes as follows "Sir: The 'nufut' (quarter dometron) is almost identical both numerically and in spelling to the Navigational Foot or 'nafut' of the TGM dozenal system published several years ago. The Nafut was put into the system for navigational work based on the Equator. In Geodsey and Navigation the Great Circle required is the Equator itself as accurately as it can be ascertained. The British Astronomical Association in their Handbook 1971 give the equat. radius as 6 378 160 metres, which multiplied by 2π comes out to 40 075 160 metres. From their formula for the length of 1° of longitude, putting latitude = 0 and multiplying the answer by 360 also gives 40 075 161 metres. Essig's Metre Duodecimale is based on a figure of 40 000 000 metres.* The Dometron based on *75 0000* wavelengths of orange radiation of Krypton eighty six, comes out to 40 058 879 metres for the Great Circle. This circle is 2.59 kilometres below sea level at the equator, about nine times the depth of Hudson Bay, about 4 times the depth of the North Sea---the deepest parts of these. The circle of the Metre Duodecimale is about 5 times deeper!*

"For those interested here are the values of these measuring units:-

	Inches		Inches
1 Metre* Duodecimale	43.949 779	1/4 metre** dd	10.987 445
1 Dometron	44.014 471	1/4 Dom (Nufut)	11.003 618
4 Nafuts (TGM)	44.032 361	1 Nafut	11.008 090
1 Ell (W.S.Crosby)	46.564 240	1 Grafut	11.641 060
(= 4 Grafuts)	* ** (Ed: See note below)		

"The Ell and the Gravity Foot are given here because they are the gravitational units, a natural phenomenon that is found obviously or latently in every duodecimal metrological system. For instance in Essig's system he gives (Annexe No. 4, p. 151):

$$\frac{\text{kilogramme-poids duodecimal}}{\text{newton duodecimal}} = 38{,}13 = \mathit{32;17} \text{ now}$$

$$\frac{\text{1 Grafut}}{\text{1 metre duodecimale}} = 0.2648 = \mathit{0;3217}.$$

The reason why Essig's figure is *100* times greater is because he used not the quedrihour ($_4$hr) but the trinihour ($_3$hr) as his basic unit of time. (In acceleration distance varies as time squared)."

* ** Editor's note:

Mr. Pendlebury's letter to the editor is helpful for all duodecimalists and is published above in full. It contains, as we see it, a couple of dozenal misapprehensions. For instance the "nufut" does not spring from the Nafut but was conceived from a much earlier intercourse of ideas. "Fut" was used in dozenal base at least a dozen and four years ago as both singular and plural of foot (see dofut, refut, mifut in the July 1956 Bulletin, p. *19*); and Charles S. Bagley, in the August 1958 Bulletin (Redivivus Reckoning), used the terms nugal, nuquart, nupint, et cetera, very effectively.

We prefer "nubbin" to describe this odd-ball and off-size foot (see April 1970 Bulletin, p. 4). It might be employed by airlines temporarily as a transitional dimension in moving from feet to dometrons to describe altitude levels. But, like a "temporary tax", it might become permanent and therefore should equal an exact dozenal fraction of a higher dozenal unit. It was foreseen in 1957 by M. Essig (see p. *15* of this issue), acceptance of whose proposals has risen and fallen in discussions at our DSA annual meetings since. DSA membership does not take a positive stance on any proposal immediately, remaining open to all international proposals of a dozenal system.

It might be observed that the TGM "Nafut" (minutely larger than the nufut) does not appear to hold an exact one-fourth relationship to the Crosby ell (such as the nufut bears to the dometron) and it diverges also from the grafut and therefore it lacks dozenal uniformity. All of the latter are dependent upon the size, shape, or twirl of a planet, whereas the dimension of the nufut is determined scientifically (as is the SI metre) by the considerably more constant wavelengths of orange-red kr. 86 light anywhere on earth or in the spaces beyond. The nufut bows to ONE great circle of the earth for navigational purposes. It is defined in terms of, and derived from, wavelengths of orange red krypton 86 light and equals exactly 3 metrons or 1/4 dometron or 461,376 kr. 86 wavelengths nevertheless. --Editor.

THOMAS H. GOODMAN, 3218 Shelburne Road, Baltimore, Md. 21208, writes: "Enjoy the Bulletin - Let's have more about Duodecimals and Computers!"

EGBERT PARDIGGLE, 306 E. Pierce St., Council Bluffs, 51501 sent this note: "I choose not to renew my Student Membership in your organization. I do not feel that it is possible to stop the U. S. from adopting the decimal metric system."

Editor's note: We will miss the writing ability of this member and the weight which his joining with other duodecimalists carried in the aggregate. We hope to see his return. Our mission is not to stop our country from adopting the decimal metric system (it was adopted over 100 years ago, 1866) but to point out advantages of our now adopting duodecimal units in the fields of time, angle, geography, astronomy, the circle, the sphere, where the decimal metric system is incompetent and has backed off or moved to compound denominate numbering----quite unmetric and tending to make simple, undeviating use of both dozenal and decimal points impracticable. In money, too, dozenal coins are more capable of fulfilling the purpose of coins---furnishing exact change, especially thirds of dollars, Halves, Quarters, Dimes and Nickels, as well as halves of these thirds. --Ed.

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