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THE DUODECIMAL BULLETIN

7#;(95.)

Why are Jay, Alice, Raphael
& Gene smiling?
See page 23;

Volume 3#

THE DOZENAL SOCIETY OF AMERICA
c/o Math Department
Nassau Community College
Garden City LI NY 11530-6793

= TEACHERS — SEE PAGE 20; =

THE DOZENAL SOCIETY OF AMERICA

(Formerly: The Duodecimal Society of America)

is a voluntary, non profit, educational corporation, organized 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.

Membership dues are $12.00 (US) for one calendar year. Student Membership is $3.00 (US) per year, and a life Membership is $144.00 (US).

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THE DUODECIMAL BULLETIN

Whole Number 7#; (Seven Dozen El)

Volume 3#; (3 Dozen El)

Number 2;

*11*6;*

FOUNDED 1160;(1944.)

IN THIS ISSUE

CONCLUSIVE EVIDENCE OF THE UNPOPULARITY OF METRIC MEASURES IN ALL AGE GROUPS

Until recently we quoted the 1995 Gallup survey for evidence to support our contention that the general public continues to think in terms of imperial units and prefers to do so rather than convert to metric. The Trago Mills survey of its own customers last August, although only a local exercise, provided valuable current corroboration, showing that 83% favour pints against 15% for litres (Gallup 87/10), 82% pounds v. 16% kilograms (Gallup 87/10), 72% yards v. 25% metres (69/26), 87% miles v. 11% kilometres (95/3), etc.

In December, however, we were presented with all the evidence concerning popular opinion that we could want, in the form of a scientific, independent, comprehensive, nation-wide survey commissioned by Abbott Mead Vickers BBDO Ltd, one of Britain's biggest advertising agencies, and conducted by Research Services Ltd, a leading market research company. Its key findings are:

> •**74% of the public find imperial units more convenient than metric;**
>
> •**the preference for customary measures covers all age-groups**, even the metric-educated 15-24 year-olds, and all regions of the country;
>
> •**only 7% are in favour of government policy** which would make all printing and packaging (for labelling and display, and including ingredients in published recipes) exclusively metric; whereas three times as many (21%) favour sole use of imperial units, and ten times as many (70%) would prefer a system of dual marking (allowing customers to use whichever is convenient for any requirement).

Christopher Booker's feature in *The Sunday Telegraph* on 21st December, brilliantly publicized this report. *The Guardian* carried a prominent account of it on 2nd January.

Please take every opportunity of quoting these results in correspondence with officials! The public are clearly on our side.

GIVE THEM AN INCH... What Britain really thinks about going metric

(Extracts from Abbott Mead Vickers • BBDO Ltd's report, November 1997)

IN SUMMARY ...

The research:

- A survey of a nationally representative sample of 1,000 British adults aged 15+, carried out by RSL in November 1997.

The findings:

- An overwhelming majority of the British public (74%) find feet and inches, pints and pounds, to be more convenient for most everyday purposes than their metric equivalents.
- The preference for customary units is stronger than that for metric across all age groups, including the metric-educated 15-24s, and across all regions of the country.
- Women are significantly more likely to prefer customary measures than men. 82% say they find the Imperial system more convenient for most everyday purposes.
- Only a tiny minority — 7% — are in favour of the current move towards printing the packaging for goods, and the ingredients listed in recipes, solely in metric measurements.
- Three times as many — 21% — would prefer these to be given in Imperial measures only.
- Ten times as many — 70% — would prefer a system of dual labelling, which would allow the consumer to choose the system which suited him or her the best.

The companies:

- RSL is one of Britain's most respected independent market research companies.
- Abbott Mead Vickers•BBDO Ltd. is Britain's leading advertising agency.

GIVE THEM AN INCH — An Introduction to the Research by Warwick Cairns, Board Planning Director, Abbott Mead Vickers•BBDO LTD

Why is it that boy-racer motorists in their early twenties will tell you how many 'miles per gallon' their souped-up Ford Escorts will do, when so few of them

will ever have bought petrol in anything but litres? Why is it that children, when you ask them how tall they are, or how much they weigh, will give you the answer in feet and inches and stones and pounds, when all they have ever learned at school is metres and kilograms? And why is it that so many cooks still talk about 'half a pound of butter', when butter has been sold, for years, in 250g blocks?

'The received wisdom has it that people do these things because metrication is still in a transitional stage. People — and particularly young people — are mainly metric nowadays, the received wisdom says, but occasionally they will use the 'old' system, where they have to, in a dwindling number of circumstances. But things, it is thought, are changing: already, most packaged goods come in metric sizes, and more and more manufacturers and retailers are dropping the 'supplementary'
Imperial equivalents (the little figures in brackets that tell you how much 250 grams are in ounces, for example) from their packs. More and more recipes in books and newspapers and magazines are printed in metric units only. In the next few years, some of the last bastions of the 'old' system — street markets and shops selling loose goods — will be required by law to make the switch, or risk heavy fines or imprisonment. This is felt to be what people want, and to be in everybody's interest. When the legal process is complete, the received wisdom has it that Britain's customary weights and measures will be abandoned altogether, and will come to be regarded merely as historical curiosities.

This research has been designed to test the received wisdom. It has two aims:

- To see which system of measurements people in Britain — both young and old — *really* feel most comfortable with.
- To see whether they actually *want* all of the goods they buy, and all the instructions and articles and recipes they read, to be wholly metric.

THE RESEARCH

Between the 14th and the 18th of November 1997, a random sample of 1,000 British adults aged 15+ were interviewed in their homes by executives of the research company RSL's computer-assisted personal interviewing (CAPI) division.

The sample was chosen to be nationally representative, using the same 58 Area Groupings used by the National Readership Survey (NRS), based on the Registrar-General's 11 Standard regions and the 12 ISBA television regions. All

THE QUESTIONNAIRE

1. Thinking about weights and measures, which kinds of measurement do you generally find most convenient for everyday purposes?
   (a)Imperial measurements such as feet & inches, pounds and pints
   (b)Metric measurements such as metres, kilograms and litres

2. On packaging for food and drink and in publications such as cookery books and magazines, how do you think weights and measures should be classified?
   (a)Pounds and pints only;
   (b)Kilograms and litres only;
   (c) Both systems

areas of the country (excluding the Shetlands and Orkney Islands) were covered. Quota controls were set for age and sex, for social class and for the balance of the kinds of areas the respondents lived in (as determined by the ACORN housing type classification).

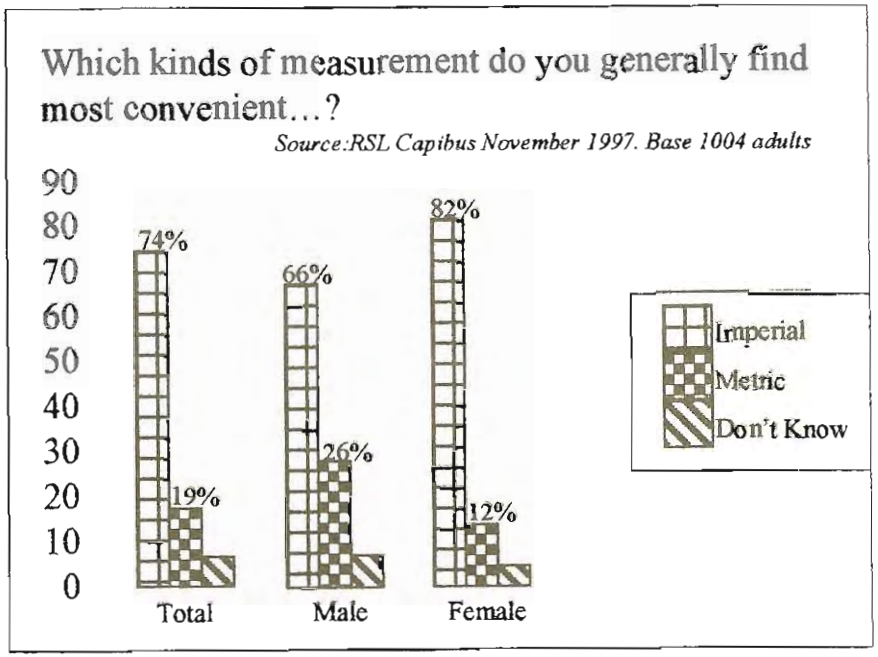

Figure 1

They were each asked two questions, and given a range of multiple-choice answers to choose from.

THE RESULTS

Overall preference, and preference by sex

- An overwhelming majority of the British public — 74% — say that they generally find the Imperial system more convenient for everyday purposes.
- Women in particular prefer British customary measures — 82% say they find Imperial more convenient, compared with only 12% who prefer metric.

Which kinds of measurement do you generally find most convenient...?
(See Figure 1 above.)

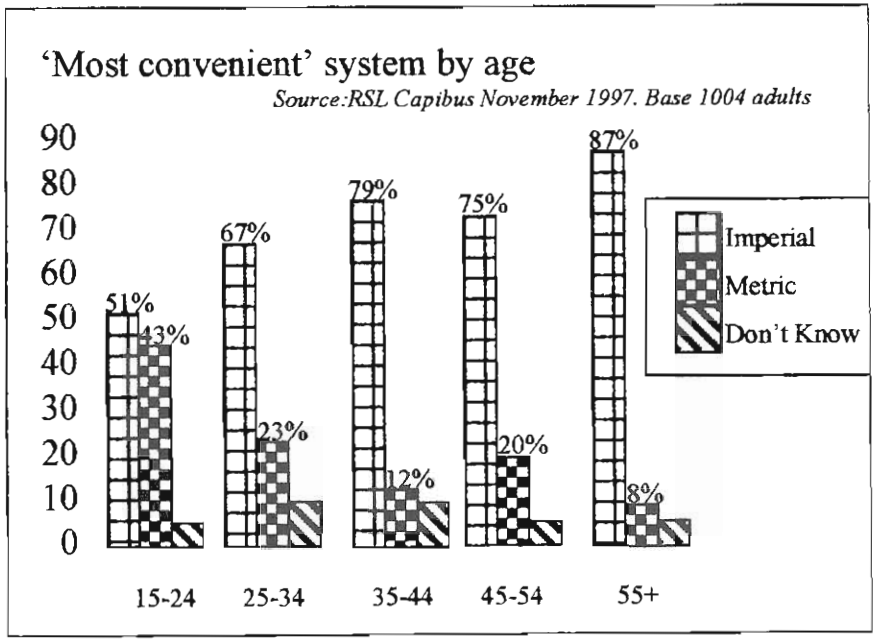

Figure 2

Preference by age

- Teenagers and young adults in their early twenties are more well-disposed towards the metric system:
  43% say that they find it most convenient. However...
- ...even amongst this age group — the product of a wholly Metric education system — a clear majority (51%) say that they find imperial most convenient for everyday purposes. (See figure 2 above.)

Preference by region

- There is a clear and huge majority preferring pounds, pints, feet and inches across the country.
- However, in urban and industrialized areas like London and the East Midlands, the preference for Imperial is a little less pronounced than it is in more rural regions.

Classification of packaged goods/recipes etc.

- When given the choice of how packaged goods should be labelled, and how recipes should be published, the current 'official policy' — metric only — was favoured only by a tiny minority (7%).
- Three times as many people — 21 % — favoured Imperial only.

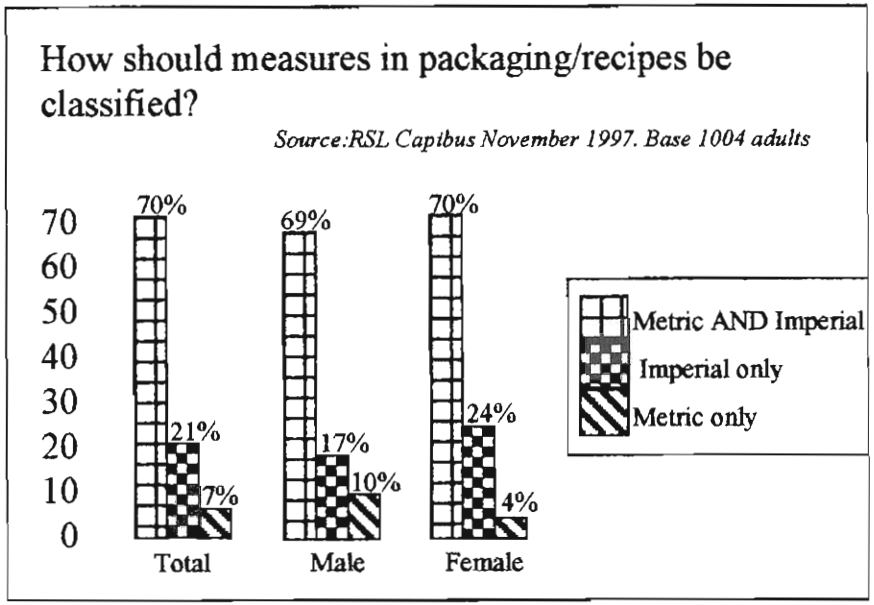

Figure 3

- Ten times as many — 70% — wanted dual labelling, allowing them the choice of systems.
- The preference for dual labelling was overwhelming across all age groups.
- The 15-24 age-group — the most split in terms of the systems they used in everyday life — was far more united in favour of dual labelling. Only 14% of 15-24s preferred metric-only. This compares will preferring Imperial only, and 68% preferring dual labelling. (See figures 3 above & figure 4 below.)

We are immensely grateful to Warwick Cairns, Board Planning Director at Abbott Mead Vickers BBDO Ltd. for supplying us with copies of the full report, and his expert statistical analysis, free of charge.

Editor's Note: This note has been reprinted with permission from *The Yardstick, Journal of the British Weights and Measures Association,* Number 6, March 1998, P.1. □

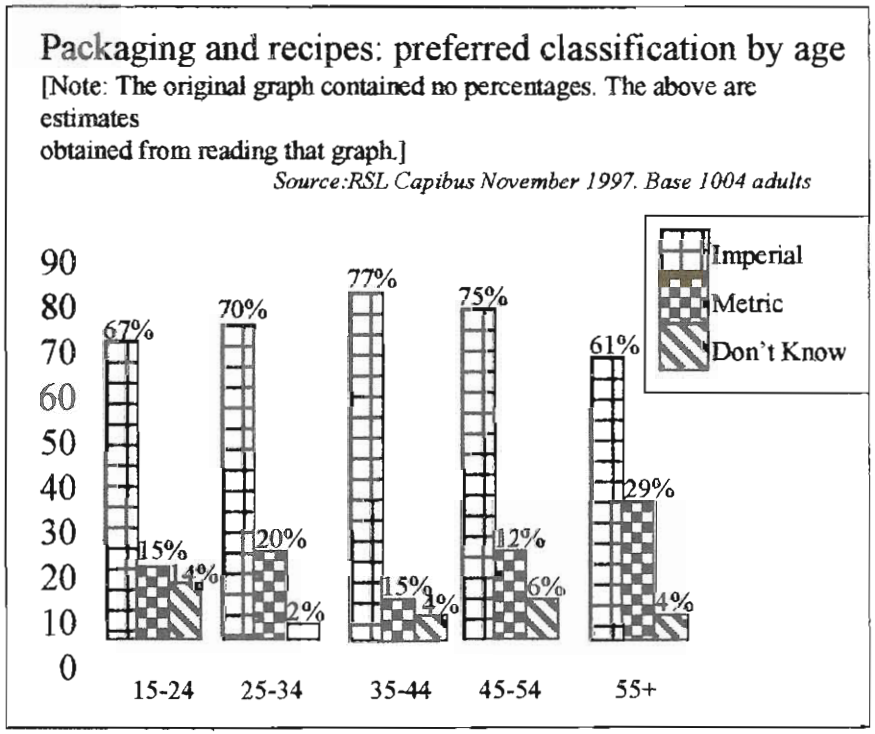

Figure 4

METRIC SYSTEM POLITICALLY CORRECT BUT NONSENSICAL

Ian B. Patten

With the appearance of the first kilometers-only sign in town on road repair work, look for a swift sprouting of them statewide this summer- with the brazen removal of mile sign-posts, if they dare.

Transportation officials exulting over the extra funding for multiple projects conveniently neglected to tell us this was federal bribe money they accepted to forcibly metricate Alaska.

Alaska was selected as a test state due to its isolation and proximity to metric Canada. The same sneaky, underhanded tactics were applied to both.

Duplicitous former Prime minister Pierre Trudeau erected kilometer signs "overnight" solely on the dubious validity of a secret White Paper, which allowed him to bypass parliamentary debate. In Alaska, former Governor Walter Hickel made the decision closeted with his state transportation officials, all gung ho to avert the threat of withheld bonus federal funding for non-compliance, regardless of consequences.

In both cases, no opinion polls were taken, no public hearings held and no referendum tendered. No legislative debate or authorization occurred. It was cowardly politics without principle all around.

A couple years ago President Bill Clinton promised no more pressure on the states and public to accept metric, although quiet efforts continued to metricate the federal government. Clinton failed to mention, however, his future tools would be subterfuge and bribery. This end-run in Alaska is the first blatant example of his smoke-screen.

Though officially pronounced archaic and moribund, the core of the U.S. Customary System has a permanent future in its streamlined version-called the Modular System. Unlike the decimal metric system, the Modular System fully complies with the laws of metrology (the science of weights and measures), which either shows us all the cardinal numbers of numerology and metrology are dozenal, or their factors and multiples: LAW ONE: The value of any measurement system lies in its ability to produce the maximum number of whole number submultiples possible.

LAW TWO: The smaller they are the better.

Clearly, these laws are all about factoribility, not metrication. Few know they even exist.

Base ten, with only factors 2 and 5, has less than two-thirds the efficiency of factor-rich twelve with 2, 3, 4, and 6. The latter also makes for a much superior metric system where every major fraction is resolute and succinct: 0;6 (half); 0;3 (quarter); 0;9 (three quarters); 0;4 (third); 0;8 (two thirds); 0;2 (sixth).

Shucking aside the pretense, plain common sense tells anyone a system where units cannot use factor 3 is unqualified. Rational geometry, for instance, is only possible with dozenal multiples for the circle: 120, 144, 240 or 360 degrees. The 400-grade circle of decimal metric gives us the lunacy of 66.666... grade angles of an equilateral triangle with the traditional 30 and 60 division of the right angle 33.333... and 66.666...grades. Scientifically, it is rubbish, but is politically correct.

Besides being modular (built on the modules or small factors of base twelve), a measurement system must also be modular in nature, that is, have units that can reflect the golden mean ratios and proportions and relate to the human frame and perspective. All the great buildings of history were erected with units like cubits, feet, inches and paces (yards). Cold, mechanical, artificial systems like decimal metric are, as Le Corbusier points out, perversions and alienations.

Enlightened future generations will count in twelves, replacing the numbers ten and eleven with single-digit symbols. The Modular System awaits them. The wholesale commercial world has always reckoned by the dozen and gross while virtually everyone worldwide counts hours and months in twelves.

Once kilometer signs are up in America the fanatics will arrogate the right to infest all building specs with those eminently-impractical, needle-width millimeters-by the hundreds and thousands.

Those perverted Celsius readings where 30 degrees is a hot day will return.

Then they will go after time with 10-or 20-hour days and work shifts of 3.333...or 6.666...hours apiece.

We will truly have regressed to the finger-counting kindergarten of the Middle Ages.

Unless Congress foolishly mandates metrication in an open, honorable, democratic manner (highly unlikely), our congressmen must take an active role in reversing this dirty blackmail.

If Governor Tony Knowles fails to challenge the feds and avert the waste of resources converting to this proven measurement fraud, he should feel the wrath of the public at the next election.

Ian B. Patten of Anchorage is a writer on metrology and the Modular System, and a member of the Dozenal Society of America.

Editor's Note: The following article appeared in "The Voice of Times" section of the *Anchorage Daily News* on June 20, 1996. Reprinted with permission. □

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PATTEN'S LAW

Courtney B. Owen

In a 1996 newspaper article Ian Patten included the following, in slightly different form, as a law of numerical bases. The idea is not new, but only its succinct statement and perhaps its application.

(Continued at the right.)

The utility of a base unit is directly proportional to its number of factors and inversely proportional to their magnitude.

See Table I below which omits the trivial factors (unity and the number itself) and thus base 2. I have used the mean magnitude rather than the median (the median gives a less-favorable result), which I can only justify intuitively. Per Bill Lauritzen, I should have tested bases 360 and 2520 (which the editor did and will include in Court's table). I did not, because I hope one of our mathematicians will test the entire proposition with an extrapolation formula.

Table I, Base Scores By Patten's Law

Base	Factors	Sum	Number	Mean Magnitude	Ratio =	Score
4	2	2	1	2 ÷ 1 = 2	1 ÷ 2 =	.50
6	2,3	5	2	5 ÷ 2 = 2.5	2 ÷ 2.5 =	.80
8	2,4	6	2	6 ÷ 2 = 3	2 ÷ 3 =	.67
10	2,5	7	2	7 ÷ 2 = 3.5	2 ÷ 3.5 =	.57
12	2,3,4,6	15	4	15 ÷ 4 = 3.75	4 ÷ 3.75 =	1.07
16	2,4,8	14	3	14 ÷ 3 = 4.67	3 ÷ 4.67 =	.64
20	2,4,5,10	21	4	21 ÷ 4 = 5.25	4 ÷ 5.25 =	.76
24	2,3,4,6,8,12	35	6	35 ÷ 6 = 5.83	6 ÷ 5.83 =	1.03
36	2,3,4,6,9,12,18	54	7	54 ÷ 7 = 7.71	7 ÷ 7.71 =	.91
60	2,3,4,5,6,10,12,15,20,30	107	10	107 ÷ 10 = 10.7	10 ÷ 10.7 =	.93
72	2,3,4,6,8,9,12,18,24,36	122	10	122 ÷ 10 = 12.2	10 ÷ 12.2 =	.82
144	2,3,4,6,8,9,12,16,18,24,36,48,72	258	13	258 ÷ 13 = 19.8	13 ÷ 19.8 =	.66
360	2,3,4,5,6,8,9,10,12,15,18,20,24,30,36,40,45,60,72,90,120,180	809	22	809 ÷ 22 = 36.8	22 ÷ 36.8 =	.598
2520	2,3,4,5,6,7,8,9,10,12,14,15,18,20,21,24,28,30,35,36,40,42,45,56,60,63,70,72,84, 90,105,120,126,140,168,180,210,252,280,315,360,420,504,630,840,1260	6839	46	6839 ÷ 46 = 148.67	46 ÷ 148.67 =	.309

It should be noted that base twelve ranks first while the cumbersome base dek ranks twelfth out of fourteen bases considered! Observe the following summary in Table II:

Table II, Summary of Bases According to Ranks

Score	Base	Rank
1.07	12	1
1.03	24	2
0.93	60	3
0.91	36	4
0.82	72	5
0.80	6	6
0.76	20	7
0.67	8	8
0.66	144	9
0.64	16	8
0.598	360	#
0.57	10	10
0.50	4	11
0.309	2520	12

□

Dues are now due for 11*7

THE DO-RE-MI SYSTEM OF DOZENAL NOMENCLATURE

(A Trip into the Land of Ever-Ever)
by Henry Clarence Churchman

Note, as is our custom, from time to time we reprint notable articles from the past. The following article was written by a former editor of this Bulletin and published in Whole Number 1*, Volume #, Number 1, pages 1-5 in May 1955.

All figures in italics are duodecimal.

The duodecimal system of numbers is based upon the assumption there are a dozen parts to every unit. The decimal system conceives every unit to be divisible into ten parts. The decimal system is now in common use. Decimal measurements reach their ultimate goal in the use of the metric system of values.

The monetary system of the United States of America is based on the metric system of values. It could be readily converted into duodecimal values.

The measurement of solids and liquids, as well as distances, both in the United States and in the British Commonwealth, in general follow a dozenal system. The foot unit, for instance, contains a dozen inches and is divisible into either two, three, four, six, or a dozen whole parts. Ten, on the other hand, is divisible into either two, five, or ten whole parts; any other division results in fractions. The dozenal system of numbers is, then, actually more practical in certain pursuits, such as carpentry, wholesale distribution, etc.

However, neither the decimal nor the duodecimal system can wholly supplant the other. As with languages, a knowledge of two systems is more useful than the introverting effect of one alone. And the study ofanother system actually helps one to understand better his own.

In this article I ask all exponents of the duodecimal system to take an Alice in Wonderland excursion with me into a land where the numerical progression contains slightly different names based upon the do-re-mi musical scale. It is only a pleasure trip, of course, from which we will return. But it may give us a new slant at our own dozenal system, perhaps tend to cause us to be more continental, even more universal, by picking up the worldwide musical scale nomenclature as a temporary substitute for our Anglo-Saxon derivatives. In a word, do-re-mi is momentarily established in place of do-gro-mo, so that "do" remains "do", but "gro" becomes "re", and "mo" becomes "mi". This exercise is just for fun. If we must learn a new nomenclature for the nonce, **it** may give us more sympathy and understanding of the problems of our newly found friends of the duo- decimal system who, themselves, are learning numerical progression nomenclature for the first time. But the do-re-mi nomenclature might gain for us a burst of sympathy in the romance language areas, so steeped in music, where the metric system is presently common.

A Simple Approach to Doremial Dozenal Nomenclature

Everyone with the slightest knowledge of music is familiar with the do-re-mi scale. Music knows no language barriers. If we consider for a moment that "do" could represent for us a dozen units of measurement, that "re" might represent a dozen-dozen objects, and "mi" a dozen-dozen-dozen things, then we should hav the implements of nomenclature to speak with facility about all values now described by "tens" and "hundreds" and "thousands". And from there, millions, billions, trillions offer no difficulty.

Speaking decimally, every "do" would represent 12 objects, every "re" would represent 144 things, and every "mi" would indicate 1728 articles. From this it might be noted that one comprises more than one and seven-tenths times the number of articles contained in one "thousand". So if we were to register automobiles by license plates using the dozenal system, the display of three digits, still speaking decimally, might comprise as high as 999 vehicles; but three digits of the dozenal system could encompass as many as 1727 automobiles. This indicates, where space is valuable, the dozenal system is superior to the decimal system. More shocking, within the grasp of six digits decimally we may register 999,999 vehicles, but we may list as high as 2,985,983 within the space of only six digits of the dozenal system.

Again speaking decimally, the ten parts may be described in units as anything from cipher through nine. But when the tenth part is added to nine, we are ready to begin a new series called "tens". One "ten" is indicated as 10. Two "tens" are indicated as 20. And nine "tens" are indicated as 90. If we add nine "units" to nine tens we have 99, which we call ninety-nine. Let us for a moment try to analyze the description "ninety-nine". It contains three syllables. If we think of the middle syllable "ty" as an abbreviation of "ten", as indeed it is, we are merely saying "nine tens and nine".

Now speaking dozenally, it is generally agreed that the dozen parts of a unit column may be described as cipher, one, two, three, four, five, six, seven, eight, nine, dek, and el. Dek is merely taken from the Greek "deka", meaning ten. El is no more than the first two letters of the English word "eleven". But when the dozenth part is added to "el" , we begin a new series called "do". One "do" is indicated as *10.* Two "do" are indicated as *20.* Nine "do" are indicated as *90,* and "el" "do" are indicated by the initial letter of "el", preceding a cipher, thus *#0,* pronounced as are the English words "ell" "doe". If we add "el" units to "el do", we have ##, which we call "el do el". Let us now try to analyze the

description "el do el", as we have just done with"ninety-nine". It contains three syllables. If we think of the middle syllable "do" as an abbreviation of "dozen", as in truth it is, we are merely saying, decimally, eleven dozen and eleven". Again speaking decimally, this number is the decimal sum of 143. Yet, to indicate that sum it was necessary, in the dozenal system, to utilize only two digit spaces, shown ~, which we call "el do el". Then, too, there is an economy of half as many syllables when we say "el do el" to indicate the sum of "one hundred forty-three."

While we are glancing at "unit" and "do" columns, let us note how easy it is to count from 13 to 24 when we change momentarily from the decimal to the duodecimal system. In the decimal system, we say thirteen, fourteen, fifteen, sixteen, seventeen, eighteen, nineteen, twenty, twenty one, twenty two, twenty three, and twenty four. Duodecimally, we say do one, do two, do three, do four, do five, do six, do seven, do eight, do nine, do dek, do el, and two do. None of the duodecimal descriptions contains more than two syllables. Yet they plainly say a "dozen and one", which equals 13, a dozen and two, which equals 14, etc.

The Three Digit Column (Hundreds)
So much for "units" and "tens", or units and dozens. Anything from one hundred to anything short of one thousand requires, decimally, three digits to express such value, In the do-re-mi nomenclature of the dozenal system, we make no reference to "hundreds", but the third column of digits, appearing to the left of the "unit" and "do" columns, might be called the "re" column, keeping in mind the do-re-mi musical scale as we move upward.

Thus, speaking decimally, 100 represents ten tens or one hundred, but, speaking dozenally in the do-re-mi nomenclature, *100* represents a dozen dozen or one "re". Or, again speaking decimally, 111 represents one hundred, one ten, and one unit. But

speaking in do-re-mi dozenal language *111* represents one "re", one "do", and one "unit", and is pronounced simply "re do one". It equals the quantity of one gross, one dozen, and one unit. The do-re-mi nomenclature simplifies its pronunciation to three syllables "re do one", whereas the decimal description requires six syllables.

Again, speaking decimally, 222 represents two hundreds, two tens, and two units, and is pronounced "two hundred twenty two". But speaking dozenally in the do-re-mi scheme of nomenclature, 222 represents two gross, two dozen, and two units, and is pronounced "two re, two do two". Decimally, six syllables are utilized. Dozenally, five syllables suffice.

The Four Digit Column (Thousands)
So much for units, tens, and hundreds, the latter occupying three digits or places.

Anything from one thousand to anything short of ten thousand requires, decimally, four digits to express such value, In the do-re-mi dozenal system of nomenclature, we make no reference to "thousands", but the fourth column of digits, appearing to the left of the"re" column, might be called the "mi" column, keeping in mind again the do-re-mi musical scale as we ascend in values.

Thus, speaking decimally, 1000 represents ten hundreds or one thousand, but,speaking dozenally with the do-re-mi complexion,

1000 represents one dozen gross or one "mi". In dozenal language, *1000* is one "mi". In decimal language, 1000 is one "thousand".

Again, speaking decimally, 1111 represents one thousand, one hundred, one ten, and one unit. But speaking dozenally in the do-

re-mi nomenclature, *1111* represents one "mi", one "re", one "do" , and one "unit", and is pronounced (coming down the musical scale) "mi re do one". It equals the quantity of one dozen gross, one gross, one dozen, and one unit. The do-re-mi nomenclature simplifies its pronunciation to four syllables. Decimally, **it** requires at least eight syllables.

Back speaking decimally, 2222 represents two thousands, two hundreds, two tens, and two units, and is pronounced "two thousand, two hundred twenty-two." But speaking dozenally in the do-re-mi nomenclature, 2222 represents two dozen gross, two gross, two dozen, and two units, and is pronounced "two mi, two re, two do two." Decimally, nine syllables are used. Dozenally, seven syllables are needed.

The Five, Six, and Seven Digit Columns and Over

Above "mi", it would seem to be unnecessary to extend the musical scale. Thus, *11,111* in the do-re-mi dozenal system of nomenclature may be described as "do one mi, re do one."

And *111,111* in do-re-mi nomenclature is simply described as "re do one mi, re do one."

When we get to *1,111,111* and above in this delightful nomenclature of the musical instrument, we avoid the decimal system of millions, billions, and trillions. The seven digits above are described in do-re-mi terms as one "hi-mi, re do one mi, re do one". And *1,111,111,111* is then quite properly described as one "tri-mi, re do one hi-mi, re do one mi, re do one

Now to transport the do-re-mi nomenclature to the sublime or to the ridiculous, according to one's present taste, one mi re do one ella-mi, re do one deka-mi, re do one nona-mi, re do one octa-mi, re do one septa-mi, re do one hexa-mi, re do one penta-mi, re do one cuatra-mi, re do one tn-mi, re do one bi-mi, re do one mi, re

do one stars in the heavens may be indicated in doremial *111* stars, or three dozen and one places left of the point.

In the doremial nomenclature, *1,000, 000,000,000,000,000,000, 000,000,000,000,000* (comprising three dozen and one places left of the point) is called, dozenally speaking, one"mi ella-mi", and is equal to the decimal sum of 1,728 raised to the dozenth power. And one mi ella-mi, mi ella-mi, mi ella mi (nine dozen and one places left of the point) is equal to the decimal sum of 1,728 raised to the three dozenth power.

Please, If you have floated this far, feel free to use the doremial dozenal nomenclature, or to leave it alone. I have found it much easier to describe one mi ella-mi in the doremial manner than to speak of "one cipher, cipher, cipher, continue until you have three dozen ciphers." Or to picture"re do one mi, re do one" as (try saying it, using the musical scale pronunciation as if dropping a note on each syllable) *111,111*. It is true that to say "one, one, one, one, one, one" requires one less syllable than to say Ray Doe Won Me, Ray Doe Won!

Our officers pictured on the front cover are enjoying themselves at last year's Annual meeting. Why not join them this year on Saturday, October 15;(17.) at *(10.) a.m. at Nassau Community College. For information call 516 669 0273 or e-mail genezirk@mindspring.com.

ATTENTION
TEACHERS & STUDENTS

Teachers - Maybe you could encourage some of your students to submit their ideas to us. And, please pass this on to teachers in other departments so that their students may benefit also.

Students - Why not send us your ideas for possible publication?

MATH CLASSES: Sometimes students write to us for information for mathematics projects. If they send us a copy of their finished work, we have often printed it in our Bulletin. Many of our readers are new to dozenals, and we like to include simple articles whenever possible.

COMPUTER SCIENCE CLASSES: Can your students submit a working computer program for changing numerals from one base to another? From base ten to twelve or vice versa? From base ten to any base. From base twelve to any base? Of course such submissions should be top-down, structured programs built from modules and using good identifiers and clear comments.

ART & DESIGN CLASSES: Those who count in the customary base ten, use ten numerals: 0,1,2,3,4,5,6,7,8,9.

Computer scientists who use base sixteen, use sixteen numerals: 0,1,2,3,4,5,6,7,8,9,**A,B,C,D,E,F**.

Dozenalists — those who believe that it is easier to count and measure in base twelve — need a dozen numerals. Some use 0,1,2,3,4,5,6,7,8,9,**A,B**.

Over the years there has been an ongoing discussion among dozenalists as to what symbols to use for dek and el.

Following the phone company, the DOZENAL SOCIETY OF AMERICA uses the asterisk * for dek and the octothorpe # for el. (As one long time member said: A Roman Numeral **X** crossed out because it's dek, *not* ten, and an eleven crossed out twice, because it's el, *not* eleven.)

The DOZENAL SOCIETY OF GREAT BRITAIN following the suggestion of Sir Isaac Pitman, the inventor of shorthand symbols, and a proponent of base twelve counting uses a rotated two for dek, and a rotated three for el.

Years ago the famous type designer William Addison Dwiggins created a script **χ** and **E** for the Dozenal Society of America.

[**A** & **B**] are standard in the computer scientist's hexadecimal system. [**T** & **E**] or [**t** & **e**] are found in many textbooks. [**d** & **k**] was advocated by our past treasurer Kay Humphrey.

Some have advocated that we should not use any of the current ten Hindu-Arabic numerals that we are all familiar with. Rather, they propose that we create an entirely new set of twelve numerals to replace 0,1,2,3,4,5,6,7,8,9,*,#. Others have held that the best symbols should be readily available on typewriters, computer keyboards, and in printer's fonts. Some prefer symbols that look like our present numbers or ones that can easily be hand written. Still others hold out for symbols that would be producible on a hand held calculator's seven-segment display.

1. Your assignment (if you chose to accept it) is to design two new numerals for dek (or ten) and el (or eleven).

2. In keeping with those dodekaphiles who hold that we should not merely add two new symbols to our current numerals. Perhaps you would care to accept their challenge?

ENGLISH CLASSES: Several science fiction stories have been written about people with twelve fingers who naturally counted dozenally. Perhaps you could submit a very short story (not more than 300 words) which involves base twelve counting?

Acceptable submissions will be published along with appropriate credit in future issues of the *Duodecimal Bulletin*.

For further information and/or literature about duodecimals contact

Dozenal Society of America
Nassau Community College
Garden City LI NY 11530
516 669 0273

WHY CHANGE? This same question was probably rife in Europe between the years 1000 and 1500, when the new Hindu-Arabic numerals were slowly making their inching progress in displacing the comfortable and familiar Roman numerals then universally used.

Yet, although it took D years, and despite much opposition--("Who needs a symbol for nothing?")--the new notation did come into popular use. Released from the drag of Roman notation, people's thinking leapt forward dramatically, and mathematicians discovered a new dimension in mathematical symbolism. Working with Hindu-Arabic numeration, they found that the new system better accommodated mathematical statements and facilitated the working out of ideas. Re-examining their fundamental concepts of numbers, they made advances in arithmetic, algebra, logarithms, analytic geometry and calculus, and thus contributed to the explosion of human thought which later became known as the Renaissance. Then, in a related development, people awoke to the fact that different number bases could be used.

A parallel to today seems tenable. The notation of the dozen base better accommodates mathematical statement and facilitates ideation. It, too, is a step forward in numerical symbolism. The factorable base is preferred for the very same advantages which led the carpenter to divide the foot into twelve inches, the baker and the grocer (one who deals in *grosses*) to sell in dozens, the chemist and the jeweler to subdivide the Troy pound into twelve ounces. And yet, this is accomplished by such simple means that students in the primary grades can tell why they are better. Literally, the decimal base is unsatis**FACTOR**y because it has **NOT ENOUGH FACTORS**.

Then should we change? Yes, but no change should be forced, and we urge no mandated change. All the world counts in tens. But people of understanding should learn to use duodecimals to facilitate their thinking, their computations and their measurings. Base twelve should be man's second mathematical language. It should be taught in all the schools. In any operation, the most advantageous base should be used, the one best suited to the task at hand. (Similar to computer scientists use of binary, hexadecimal or octal - whichever is most convenient.) If this were done, duodecimals would progressively earn their way into general popularity because they simplify the all-important problem of the correlation of weights and measures, the expansion of fractions (1/3 = 0;4) and give an advantage in calculations involving time and our twelve-month calendar. Perhaps by the year 2000, (or maybe by 1200; which is 14; years later!) duodecimals may be the more popular base. But then no change need be made, because people will already be using the more convenient base.

If "playing with numbers" has sometimes fascinated you, if the idea of experimenting with a new number base seems intriguing, if you think you might like to be one of the adventurers along new trails in a science which some have erroneously thought staid and established and without new trails, then whether you are a professor of mathematics of international reputation, or merely an interested pedestrian who can add and subtract, multiply and divide, your membership in the Society may prove mutually profitable, and is most cordially invited. □

YOU ARE INVITED TO JOIN THE DOZENAL SOCIETY OF AMERICA

The only requirement is a constructive interest in duodecimals

Date__/__/__

Name _____
Last First Middle

Mailing Address (including full 9 digit ZIP code)

_____

_____

_____

Phone: Home_____ Business_____

Fax _____ E-mail _____

Business or Profession _____

Annual Dues . . . . . Twelve Dollars (US)
Life . . . . . One Gross Dollars (US)
Student (Enter data below) . . . . . Three Dollars (US)
(A limited number of free memberships are available to students)

School _____

Address _____

Year & Math Class _____

Instructor _____ Dept. _____

College Degrees _____

Other Society Memberships _____

Kindly select one of the following:

__ To facilitate communication I permit my name, address & phones to be furnished to other members of our Society.

__ I do not wish my name, address & phones to be communicated to other members.

Please include on a separate sheet your particular duodecimal interests, comments, and other suggestions.

Mail to: Dozenal Society of America
c/o Math Department
Nassau Community College
Garden City LI NY 11530-6793

DETACH--HERE--OR--PHOTOCOPY