The Dozenal Society of America
WHY CHANGE by Ralph Beard

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.

"Why even try to learn to use these heathenish scrawly symbols, with their stubborn propensity for error, in place of the beautiful clear numbers which our fathers have used for untold generations? Think of the needless waste. We would have to change all of our counting boards and abaci. X is X, isn't it? And why do we need a symbol for nothing? You can't count it! No! Let us keep to our simple tried-and-true numerals, and let the barbarians scratch their heads, and rub themselves out. It will all come to '0' anyhow."

Yet, although it took 'D' years, the new notation became generally used, and man's thinking leapt forward like an arrow sped from a bow. The early years of the Renaissance marked a new stage in the use of symbols, with the advent of algebra, fractionals (decimals?), logarithms, analytical geometry, and the calculus. Can you imagine what it would be like to try to express the coordinates on the points of a curve in Roman notation?

Mathematicians became conscious of a new dimension in symbolism, and the fundamental concepts of number were reexamined. Man awoke to the fact that different number bases could be used, and Simon Stevin stated in 1585. that the duodecimal base was to be preferred to the decimal.

The new Arabic notation accommodated mathematical statement better, and facilitated ideation. All thinking accelerated when released from the drag of the cumbrous Roman notation.

The parallel seems tenable. The notation of the dozen base accommodates mathematical statement better, and facilitates ideation. It, too, is a step forward in numerical symbolism. The factorable base embodies a concurrent analysis and definition of numbers that stimulates classification and generalization. Yet this is accomplished by such simple means that students in the primary grades easily learn to perform computations in duodecimals, and can tell why they are better. Literally, the decimal base is unsatis-FACTORy because it has "NOT ENOUGH FACTORS".

Then, shouldn't we change? No! No change should be made and we urge no change. All the world uses decimals. But people of understanding should learn to use duodecimals to facilitate their thinking, and to ease the valuative processes of their minds. Duodecimals should be man's second mathematical language. They should be taught in all the schools. In any operation, that base should be used which is most advantageous, and best suited to the work involved. We expect that duodecimals will progressively earn their way into general popularity. But no change should be made. Perhaps by the year 2000., or maybe 1200;, which is 14; years later, duodecimals will be the more popular base. But then no change need be made, because people will already be using the better base.

%	F.	P/G
50	½	60
33⅓	⅓	40
25	¼	30
20	⅕	24⅘
16⅙	⅙	20
12.5	⅛	16
11⅑	⅑	14
10	1/10	12⅖
8⅓	1/12	10
6.25	1/16	9
5⅝	1/18	8
5	1/20	6⅕
4⅙	1/24	6
4	1/25	5 17/21
3.125	1/32	4;6
2⁷⁄₉	1/36	4
2 1/12	1/48	3
2	1/50	2 1X/21
1 7/18	1/72	2
1	1/100	1 7/21
0 25/36	1/144	1

Table comparing decimal percentages on the left with dozenal pergrosses on the right. The fractions in the center are expressed in decimal. Figures in red represent regular, terminating fractions, while those followed by fractions repeat. Only those fractions which are regular in either system and greater than 1 percent in decimal or 1 pergross in dozenal are shown.

When one is familiar with duodecimals, a number of accessory advantages become apparent. Percentage is a very useful tool, but many percentages come out in awkward figures because of the inflexibility of decimals. When based on the gross, twice as many ratios come out in even figures, and among them are some of those most often used, as thirds, sixths, and twelfths, eighths, and sixteenths. There are advantages associated with time and the calendar. Monthly interest rates or changes are derived from annual rates, or the reverse, by simply moving the unit (decimal?) point. The price of a single item bears the same relation to the price of a dozen, and so does the inch to the foot.

The proper correlation of weights and measures has always been one of the world's serious problems. None of the present systems is completely satisfactory. The American and English standards are convenient to use since they are the final result of a long process of practical evolution in which many inconvenient measures have been adjusted or abandoned. The French decimal metric measures have the advantage of being set upon the same base as the number system, and are well systematized. But many of the units are awkward because of their arbitrary sizes, and because their decimal scale does not accommodate division into thirds and fourths readily.

The duodecimal system of weights and measures, based on the inch and yard, the pint and the pound, has the desirable elements of both systems, and few of their faults. This Do-Metric System retains the familiar units of the American and British standards in approximately their present size, and arranges them into an ordered metric system using the scale of twelve. This fits perfectly into the duodecimal notation, and the combination accommodates the inclusion of the units of time and of angular measure within the system, which hitherto has not been possible.

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 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, subtract, multiply, and divide, your membership in this Society may prove mutually profitable, and is cordially invited.