DSA Newsrast

Vol. 03, Iss. 07 | *The official newsletter of the Dozenal Society of America* | 1 July 11ᘔᘔ

Doman Numerals: For the Gravitas of It

In this issue . . .

The Dozenal Society of America is a voluntary, nonprofit educational corporation, organized for the conduct of research and eduction of the public in the use of dozenal (also called duodecimal or base twelve) in calculations, mathematics, weights and measures, and other branches of pure and applied science.

As dozenalists, we spend a lot of our time focusing on the many benefits of place notation—and we're right to do so. Place notation reveals a world of arithmetic and mathematics that other systems of notations make obscure, or even opaque. We've adopted place notation for nearly everything we do with numbers, because it's so much easier to use them than to use other systems. We *love* place notation.

But that doesn't mean that previous systems are no longer around, or no longer useful. Specifically, Roman numerals are still quite common. There are a few places where they are used simply due to the heavy weight of long tradition; e.g., movie publication years. (Ironically, the supposedly more stodgy book industry started using place notation in their publication dates long ago, while movies have still not done so.) We use them decoratively on clocks and watches. We use them when we simply need different-looking numbers, as when we're doing outlines or subsections. And, of course, we use them when we're trying to seem impressive, as in the titles of the more dramatic type of sequel, or the numbers of kings of a certain name (it's *never* Elizabeth 2, after all). There is still a place for these numbers, by which the Western world kept its accounts for so many biquennia.

Yet Roman numerals are unavoidably decimal, are they not? "X" means "ten"; it can't mean 10, our beloved dozen. Plus, no matter how much gravitas it lends to a subject, it's still clumsy: some clocks say "IIII," while some say "IV"; and when we get to XL ("forty"), people begin to forget how the numbers go. Asking someone to read something like the current year ("MMXV") is probably too much, and before the change to the most recent century, it was certainly so. ("1997" could be written in many different ways; probably the simplest is "MCMXCVII.") Most people have given up trying to read the number of the current Super Bowl; to them, it's just a series of letters.

So why not present a new way of writing Roman numerals, one which preserves their gravitas, keeps them clearly distinct from our usual means of writing numbers, *and* uses letters to allow them to be used in either uppercase or lowercase? Fortunately, Gerard Robert Brost (#294) gave us such a system, in 57 The Duodecimal Bulletin 4 in 1197: dozenal Roman numerals, or Doman numerals.

The system is a remarkably simple adaptation of Roman numerals, preserving their appearance while rationalizing their use. (And, of course, *dozenalizing* it.) We know that in Roman numerals, "V" is 5 and "X" is ᘔ; in Doman numerals, we make "V" equal 6 and "X" equal 10. Then, to avoid unwieldy strings of "I"s, we introduce the notion of *two* or *three* "I"s preceding another number working to subtract two from it, as well as only one "I." So here is our basic sequence, 1–10:

I	1
II	2
III	3
IIV	4
IV	5
V	6
VI	7
VII	8
IIIX	9
IIX	ᘔ
IX	Ɛ
X	10

But Doman numerals go farther than this. We also introduce a new digit, "N," which we can think of as standing for "nil" or "null." "N" means zero, and enables us to continue our Doman numerals as far as we need to without introducing new letters. Roman numerals, on the other hand, need to introduce "L," "C," "M," and versions of these with overlines in order to get any farther than thirty-nine (in Roman numerals, "XXXIX").

So we can use "N" the same way we use zero, and simply begin assembling numbers using place notation without losing the gravitas or aesthetics of Roman numerals. (Indeed, when Hindu-Arabic numerals began to replace Roman numerals in Europe, adding a zero and using place notation with Roman digits was sometimes exactly what was done.) Rather than use "X" for 10 (though we can), we can use "IN." We can continue on with this in the usual way: I N, I I, I II, I III, I IIV, I IV, I V, I VI, I VII, I IIIX, I IIX, I IX, II N, II I, II II, II III, etc.

Of course, this system *is* still less convenient than our pleasant Hindu-Arabic digits. It uses only four different characters, for one thing, which makes it rather easily confused; and since each place can contain multiple characters, we need a space between each one to make it work. But this is not in any way proposed as a *replacement* for Hindu-Arabic digits; it's proposed as a replacement for *Roman* numerals, and at that it's quite effective.

A benefit of this system is that it makes a few things about the number visible at a glance. For example, the last digit of any number is the smallest divisor of that number, in all cases. E.g., a number ending in III is divisible by 3 but not by 2; a number with only two adjacent Is in its final place is divisible by 2 but not by 3, and if it also has a V it is divisible by 4; if the last place has only one I, it's not divisible by 2 or 3 (and all primes contain only a single I in their final places); a number ending in V is divisible by 2, 3, and 6; and if the last digit is N, it's divisible by 2, 3, 4, 6, and 10.

A few examples:

1. The previous pope was Benedict I IV. (One dozen fourth, or sixteenth.)
2. The current queen of Great Britain is Elizabeth II. (Still.) Her father was George V.
3. The last king of France with a number (that is, prior to Louis-Philippe) was Louis I V. (One dozen six, or eighteenth.)
4. The next Super Bowl will be Super Bowl IIV II. (Four dozen two, or fifty.) Last year was Super Bowel IIV I. (Four dozen one, or forty-nine; in Roman numerals, XLIX.)

So we get equal gravitas with simpler numbers. Doman numerals can be a useful tool in our dozenal toolbox.

Society Business

Reminder: Annual Meeting for 118Ɛ

Our annual meeting location for 118Ɛ has unfortunately will be held in Cincinnati on October 15 (17.). Treasurer and Board Chairman Jay Schiffman (#208) will be determining our venue, as he will be in Cincinnati this July for another conference. Prior to this meeting the DSA will present a program at the OCTM 118Ɛ conference in the same city.

The Next *Bulletin*

Our new editor, John Volan (#418), is hard at work producing the next issue of our *Bulletin*. If you have any ideas you'd like to share, please send them to him:

editor@dozenal.org

It doesn't need to be long, and it doesn't need to be profound; it just needs to be related to non-decimal counting, arithmetic, or mensuration, and interesting to our membership.

If you have anything that qualifies, please send it in.

Dozenal News

Unicode Officially Encodes Dozenal Numerals

It's been a long road, but finally, the Unicode standard has adopted and encoded dozenal transdecimals, as of version 8.0.0, which was released on 15 June 1ᘔᘓ:

http://www.unicode.org/versions/Unicode8.0.0/

http://www.unicode.org/charts/PDF/U2150.pdf

These are, specifically, the Pitman digits, listed in the standard as "TURNED DIGIT TWO" and "TURNED DIGIT THREE." They are encoded at U+218A and U+218B. It will take some time before fonts have actual glyphs in these positions; however, the Symbola font has already included them:

http://users.teilar.gr/~g1951d/

As has been mentioned, having dozenal characters in Unicode is a great boon to us. It allows us to write programs which understand that these two characters are real numbers, not simply letters being used as numbers, it allows sort programs to properly order numbers because it will realize that these numbers are ten and eleven and not the letters X (or T) and E, and means that we will have a great deal more choice in typefaces as more and more fonts include these characters. The inclusion is largely due to Karl Pentzlin's tireless effort; we'd encourage anyone who knows him to thank him for this.

Multiplication Tables in Various Bases Updated

This document, long the most popular that we offer, has been thoroughly updated by long-standing member Michael deVlieger (#37ᘔ):

http://www.dozenal.org/drupal/content/multiplication-tables-various-bases

Formerly, this fantastic document had covered only certain bases between 2–50, and was lovingly assembled by hand; now it covers all bases between 2–50, and is perfectly accurate due to being produced automatically by a Mathematica script. If you haven't explored this document in a while, now is a great time to do so.

Collected Works on Reckoning Reform, by Sir Isaac Pitman, Published

Better known for his system of shorthand, Sir Isaac Pitman was also a supporter of rational number, or "reckoning," reform, and even paginated his *Phonetic Journal* in dozenal for some years. A few of his more prominent works on the subject have been collected here:

http://www.dozenal.org/drupal/content/collected-works-reckoning-reform

These articles represent some of the earliest activism for a real change to the dozenal system, along with one of the earliest appearances of the now-famous Pitman numerals, in the third article in the collection, entitled "Reckoning Reform." Well worth perusing.

Poetical Diversion

You may talk o' two and five
in your decimal-ridden dive,
if you don't need math or numbers
when you plot it;
But when it comes to workin',
then it's decimal you'll be shirkin',
'cause when you'll be needin' factors, ten ain't got it.
In arithmetic's good time,
such a sunny, happy clime,
I often used to try to understand it;
But with decimal, it was dark;
ten is all bite and no bark;
I could not be more confused if I had planned it.
And it's "Ten! Ten! Ten!
You limping lousy number, rotten Ten!
We all must bend to you,
but your pattern's all askew,
you stinking, rotten number, lousy Ten!"

Just a three is all I need,
and for thirds I ceaseless plead,
but I cannot get a tiny, simple factor;
if it isn't five or two,
Ten has nothing good for you,
and so I've now become Ten's great detractor.
It has neither three nor four,
six, eight, nine; Ten's factor-poor;
its primes are hard to locate; it's too small;
its thirds just go forever;
three will match its powers never;
if I've gotta deal more with it, I'll just bawl.
And it's "Ten! Ten! Ten!
I'm sick and bloody tired of silly Ten!
There has got to be a better
than all numbers' scarlet letter;
I must find a better base than stinkin' Ten!"

So I took my two and three,
multiplied them for to see
whether I could come up with a firm foundation;
then I multiplied by two
for to work that one in, too,
and to put these three great factors

in relation;
Two and six, and three and four,
both make Twelve, number of lore,
and when added up come up to more
than that;
If you want thirds with ten,
or just quarters, try again;
compared to Twelve, this silly base
falls flat!
So it's "Twelve! Twelve!
Twelve!
This great and handy number, noble Twelve!
We can get the parts we need
when from silly Ten we're freed;
You're a better base than Ten is,
noble Twelve!"

Oh, good Twelve is here to save,
all of us from that foul knave,
that cumbersome and clumsy number Ten;
When Twelve's challenged, you will
see;
he'll just split up into Three,
and Ten'll lose to Twelve time and
again!
An abundant number must
send a non-abundant bust;
like water to the thirsty it will be;
while Ten keeps in the dark,
math with Twelve is like a lark,
a light chasing the dark so we can
see.
And it's "Twelve! Twelve!
Twelve!
You great and noble number,
mighty Twelve!
With the Dozen, we'll be free,
truth in math we now can see;
you're the best of all good bases,
noble Twelve!

Donations

Members, please remember that while dues are no longer required for membership, we still rely on the generosity of members to keep the DSA going. Donations of any amount, large or small, are welcome and needed.

A donation of $10; ($12.) will procure Subscription membership, and entitles the payer to receive both a digital and a paper copy of the *Bulletin* if requested. Other members will receive only a digital copy. To invoke this privilege, please notify the Editor of the Bulletin, Mike deVlieger, at mdevlieger@dozenal.org

As members know, we are a volunteer organization which pays no salaries. As such, every penny you donate goes toward furthering the DSA's goals.

It may be worth considering a monthly donation; say, $3, or $6, or whatever seems reasonable to you. This can be set up quite easily with Paypal or WePay, both of which are available at our web site.

Of course, if you prefer to donate by check, you may send them to our worthy Treasurer, Jay Schiffman, payable to the Dozenal Society of America, at:

Jay Schiffman
604-36 South Washington
Square, #815
Philadelphia, PA 19106-4115

Remember, too, that the DSA will likely soon be a 501(c)(3) tax-exempt organization; when this happens, your contributions will be tax deductible under applicable law.

For Sale

The DSA is pleased to offer the following for sale. These are all either at cost, or the proceeds go to the Society.

Item	Price ($)
Wall Calendar for 11ℰℰ, coiled binding	10.05
Weekly Planner for 11ℰℰ	8.29
TGM: A Coherent Dozenal Metrology	8.00

Prices are, unfortunately but by necessity, in decimal. To find these works, simply go to:

http://www.lulu.com/shop/shop.ep

and enter the appropriate terms. E.g., searching for "11EE" will turn up these calendars and the planner; searching for "TGM dozenal" will turn up the TGM book.

We hope to offer other titles, and even some other items (such as dozenal clocks and the like), in the near future.