DSA Newscast

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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.

Dactylonomy, Part IIV

Human biology offers us limited tools; we need to take advantage of what is there, at least barring science-fiction levels of genetic manipulation. So what tools do we have? Can we meaningfully count in a base larger than our number of fingers?

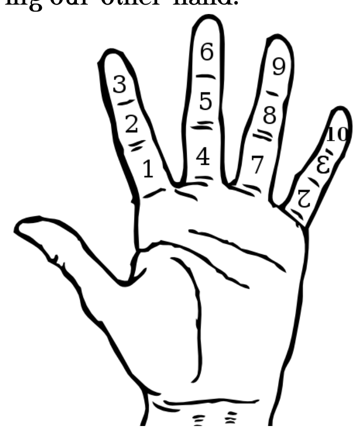
Yes, we can, because the number of our fingers isn't the only aspect of our biology that we can use to count. Indeed, even that number is a matter of debate; as Thomas Leech pointed out many unquennia ago:

> In books of arithmetic which touch upon this subject [non-decimal bases] at all, we are generally told that man has ten fingers, and that 'uncivilized man' reckoned upon these fingers, and so came about the decimal system in the most natural manner possible. That man *has* ten *fingers* is a proposition open to question.

(From Dozens vs. Tens, available at http://www.dozenal.org/drupal/content/dozens-vs-tens.) It's beyond question that two of our "fingers," or digits, are quite different from the other eight; namely, our thumbs are quite different from our fingers. Not only do our thumbs have *two* segments, while our other digits have three, but they are also *opposable* to all our other digits; that is, our thumbs can touch all the other digits on their own hands, something none of our other digits can manage. When we remember this, we are halfway to a very simple and versatile finger-counting system.

The other half, as most dozenalists will immediately recognize, is to notice that each of our non-thumb digits have three segments. There being four such digits on each hand, we immediately recognize two of our favorite number's factors, three and four, and have twelve segments we can use to count.

Using our thumb to touch each segment of each finger in order, we can easily count to a dozen without even involving our other hand:



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Keeping in mind some of our earlier experiences finger-counting, particularly in binary and ternary, we can consider using each of our *hands* as a dozenal digit, rather than each of our *fingers*, and manage to count all the way up to 100 in this way.

To explain more clearly: using the first hand, count on the segments of the fingers to ↋, then count to 1 on the second hand and return to zero on the first. On the first, count again to ↋, then count to 2 on the second and return to zero on the first. And so on.

This is likely the simplest system we can derive without resorting to digital gymnastics; that is, with a simple sequence of anatomical parts. And with a range of 10^2, it's a respectable system that will serve well for most uses.

It also has the benefit that it's recognizable from a distance, as simply tallying fingers is; we can hold up a hand or two in a busy situation, like a stock floor or a market, and the number we are requesting can still be immediately recognizable.

However, if we *are* willing to engage in a bit of more difficult but not impossible contortions, we can achieve quite a bit more.

It is possible to generate *two* dozenal digits on each hand, though naturally more difficult than the former. (Indeed, the former is the way that most dozenalists, quite sensibly, finger-count most of the time.) In this system, the thumb and forefinger serve as the first dozenal digit, and the middle, ring, and little finger serve as the second. The third and fourth are on the other hand. Here's how it works:

0 All fingers and thumb down.

1 Index finger up.

2 Thumb touches tip of index finger (the American "a-okay" sign).

3 Thumb touches the flesh of the top segment of the index finger.

4 Thumb touches the middle segment of the index finger.

5 Thumb touches the bottom segment of the index finger.

6 Thumb touches the *back* of the bottom segment of the index finger.

7 Thumb touches the back of the middle segment of the index finger.

8 Thumb touches the back of the top segment of the index finger.

9 Thumb erect, index finger touches the flesh of the top segment of the thumb.

↊ Thumb erect, index finger touches the bottom segment of the thumb.

↋ Index finger touches the back of the bottom segment of the thumb.

And for the second digit, we use the middle, ring, and little fingers as follows. Note that the middle finger here must have *three* possible positions: down, up, and up but bent in the middle, which is here termed "crooked."

0 All three down.

1 Little finger up, ring and middle down.

2 Little and middle down, ring up.

3 Little and ring up, middle down.

4 Little and ring down, middle up but bent at middle ("crooked").

5 Little up, middle crooked, ring down.

6 Little down, ring up, middle crooked.

7 Little and ring up, middle crooked.

8 Little and ring down, middle up and erect (not "crooked").

9 Little and middle up, ring down.

↊ Little down, ring and middle up.

↋ All three up.

This system, or any like it, takes some getting used to; but it does enable a counting range of 10^4, which is quite extraordinary given a base as large as dozenal. However, this system, while allowing us to count and keep track of that counting on our fingers, is too convoluted to allow for easy use in calculations. So for the remainder of this little article, we will focus on the finger-segment method.

The finger-segment counting works more or less exactly like a simple abacus, with one hand serving as one twelve-bead line and the other serving as a second. This means that we can easily perform addition and subtraction simply by "sliding the beads," or by counting down on our fingers, provided that our sums and differences are in the range of 0–100. Consider 84 − 37, for example. Remember that the 4 and the 7 are displayed on one hand, while the 8 and 3 are displayed on the other. Since subtraction is not commutative, start with the larger number, 84, and form is on your two hands; this means make an 8 with one hand and a 4 with the other. Now take 3 away from one hand, giving you 54; then take 7 away from your other. Remember that when you pass 0, you need to take another away from your first hand. Just by counting them down one digit at a time, you solve 84 − 37 = 49.

And this concludes our series on dactylonomy. While a minor topic, it's important to show people that the tools they've always relied on for their counting and arithmetic are still available to them in dozenal, but more cleanly and easily used. Here, we see that dozenal not only offers similar finger-counting tools to decimal, but that it offers better ones, with greater range and easier use. Such tools are the best method of proving to "normal" people (non-math enthusiasts) that dozenal will benefit them.

Note: The heading here is not a typo; rather, it is a dozenal adaptation of Roman numerals, titled "doman numerals," as divised by member Gerard Brost (#294). See 30 The Duodecimal Bulletin 4 (New York: 1197) *for more information.*

Society Business

Annual Meeting for 11↋↋

Our annual meeting location for 11↋↋ has unfortunately been undetermined until recently. However, a quorum of your Board discussed the matter by phone on 16 May and decided that, as tentatively suggested at our last annual meeting, we would meet in Cincinnati on October 15 (17.). Treasurer and Board Chairman Jay Schiffman (#2↊8) will be determining our venue, as he will be in Cincinnati this July for another conference.

More details will be forthcoming as they are finalized.

DSA Will Present at OCTM 11↋↋

Our Secretary and chairman of our Educational Outreach Committee, Jen Seron (#3↊2), has been doing wonders for dozenal awareness for the last several years, leading the way for the DSA to present at the annual conference of the American Society for Engineering Education (Atlanta, 11↋9), two separate regional conferences of the National Council of Teachers of Mathematics (Indianapolis and Richmond, 11↋↊), and now the regional conference of the NCTM in Cincinnati (13–14 October 11↋↋). Thanks yet again, Jen!

Our Tax-Exempt Status

After the kerfuffle earlier this year regarding our tax-exempt status being restored, then apparently not being restored, then it appearing to be a computer glitch showing that we were not restored when in reality we were, it is understandable if our membership is more than a bit tired of the drama.

We are pleased to announce, however, that not only have we received a confirmation letter last December from the IRS that our status has been restored (as reported in the *Newscast* in January, 03:01), but the IRS's computer glitch has also been fixed, and thus we are showing as restored on the IRS's exempt organizations list.

This means that donations made to the Society may be eligible for deductions under applicable law as of the date of our application for restoration to 501(c)(3) status; that is, as of 21 May 11↋9 (25 May 2013).

That's not a typo; we applied for restoration of our status in May of 11↋9, and our application was not fully processed until December of 11↋↊, over a year and a half later.

However, we (and I'm sure our membership) are glad that the matter is now settled.

The Next *Bulletin*

Members, we all have an interest in dozenal counting, arithmetic, and mensuration, or we wouldn't be members at all. Our *Bulletin* is our flagship publication, in continuous print for nearly 60 years; to put that in perspective, the Second World War was still raging when we published our first issue, the Atomic Age had not yet begun, and Franklin Roosevelt was still president.

Doubtlessly our members have noted that our *Bulletin* has been in a dry spell of late, due to the excessive press of business that has, for the last two years, prevented our last Editor from working much on it.

But our new editor, John Volan (#418), is eager to get started. 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

Orthogonal, by Greg Egan, Showcases Dozenal

Board member and new Editor of the *Bulletin* John Volan (#418) has uncovered the recent science-fiction novel trilogy, *Orthogonal*. Written by Greg Egan, the three novels (*The Clockwork Rocket*, *The Eternal Flame*, and *The Arrows of Time*) cover a truly unique and interesting alternative reality, in what sounds like a very rigorous way.

More to our interest, however, is that the *Orthogonal* people are *dozenal*. They count and measure in dozens, and the book doesn't translate that for those of us living in a benighted decimal world. All the numbers are expressed in terms of dozens, grosses, and dozens of grosses.

This is a great way to publicize knowledge about dozenal, and it appears to be a relatively popular series. The more such works are available, the more our favorite base will seem less like a weird eccentricity and more like a superior alternative for the future.

I've already ordered my copy!

Memorizing π

There have long been little mnemonics designed to help memorize some of the digits of π, typically consisting in series of words, each of which contains a number of letters equal to its corresponding digit of π. An example often used for the decimal π is:

May	I	have	a	large	container	of	coffee[?]
3.	1	4	1	5	9	2	6

How useful such things are practically for memorizing π is questionable, but the amusement value is worthwhile, if nothing else.

On the DozensOnline forum back in January, member "Dan" challenged other forum participants to come up with similar mnemonics for dozenal. John Volan (#418) came up at first with a shorter version:

> Can I conclude this abstract "o" character will represent "nil" numerically, Fibonacci[?]

This gets us 3;184809493↋9, the first dozen digits of π, with the added benefit of throwing in little nuggets about place notation (the meaning of "o") and history (that Fibonacci popularized the notion in Europe). He eventually came up with the following:

> Can I conclude this abstract "o" character will represent "nil" numerically, Fibonacci? I shouldn't expect people will adopt, readily, the ridiculous notion of a — a substantive nonquantity? A chaos? A blank ovoid?? A nihilistic "o" digit??? Clearly no potential to elucidate "o" coherently!!

Punctuation doesn't count. But this brings us through 3;1848 0949 3↋91 8664 573↊ 6211 ↋↋15 1551 ↊057 2929 0↊78 09, (the first *37* digits of π), an impressive feat to say the least.

Poetical Diversion

There once was a number from hell;
as a base, it's a pretty hard sell;
  it comes right after nine
  and for that, it is fine,
but for counting, it doesn't do well.

For its factors are few, two and five;
into thirds it will never arrive;
  and even its quarters,
  though praised by supporters,
are not whole, and can't keep it alive.

Noble Twelve is the number from heaven,
it's to numbers as bread is to leaven;
  it has two, three, and four,
  even six; and what's more,
good tests for the rest, except seven.

So we must favor Twelve over Ten
as an aid to mathematical ken;
  so we'll learn numbers better,
  'rithmetic to the letter,
and bring better math to all men.

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.

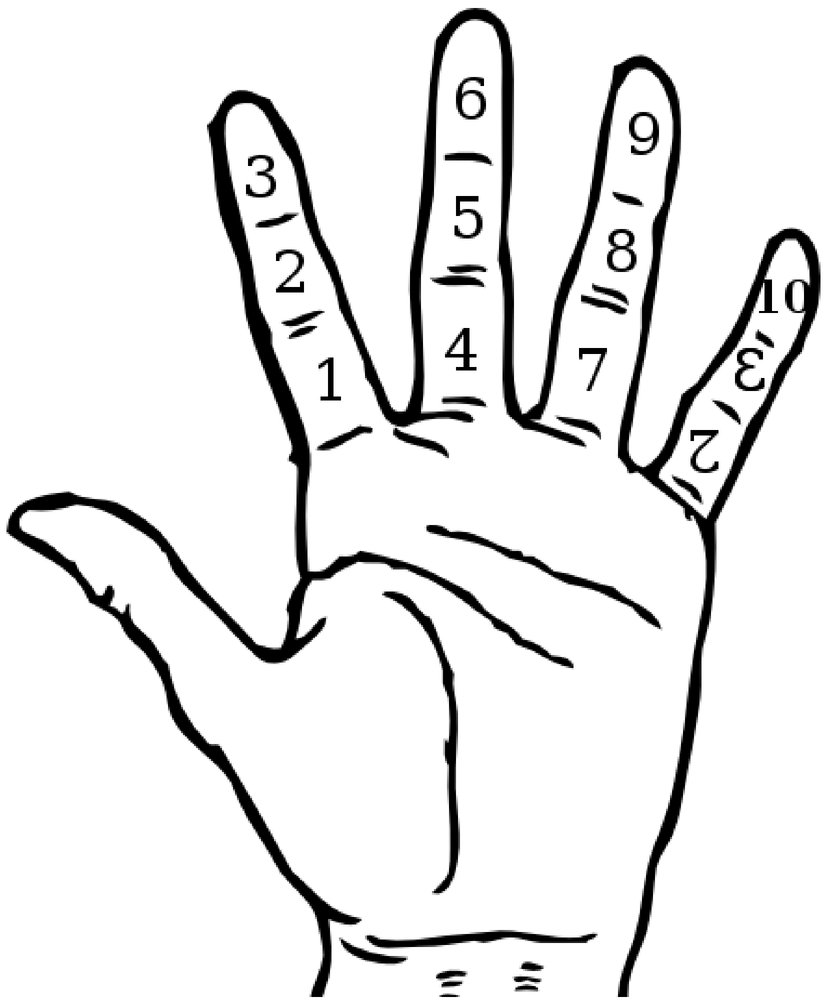
Item	Price ($)
Wall Calendar for 11ƐƐ, coiled binding	10.05
Weekly Planner for 11ƐƐ	8.29
TGM: A Coherent Dozenal Metrology	8.00

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.



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