## POSTERMINARIES

ROUND NUMBERS

(Come all you rounders, for I want you to hear/The story of a brave engineer[1])

Whatever it is that makes a number round, it embues that number with a powerful psychological advantage over less round numbers.[2] It was a trivial example that raised my consciousness of this very human foible. Some time ago, the speed limit signs posted on the roads where I work were amended. The limit stated in units of miles per hour (*mph*) was supplemented with a metrified[3] version. I have no particular prejudice against kilometers but must confess that for road signs I still mentally convert to miles which are hardwired into my subconscious sense of speed.[4] I just multiply by 0.6, which is good enough for my psyche and for my speedometer.

Then the nit-picking physicist in me took control of my more common senses and was horrified at the approximation used to metrify. In *mph* it's 30 which computes roughly to 48.28032 *kph*, a value that

Plateaus in rise of Dow Jones Industrial Average® resulting from roundness barriers.[16]
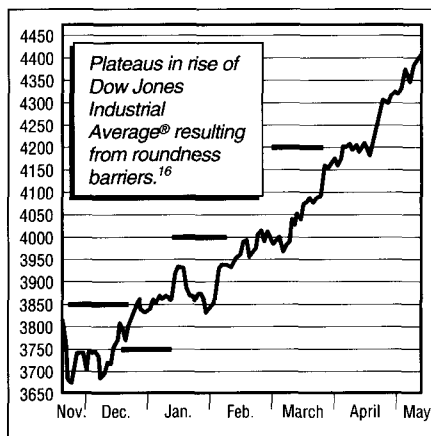
would not come close to fitting on the sign to say nothing of its lack of readability. I'm sure that's an important traffic sign consideration. The posted number was an

even 48 *kph*. Naturally, I wondered why the *mph* limits are always in multiples of 5 *mph*. MOD(5) = 0 is apparently important.[5] Perhaps our normal per limb complement of fingers and toes is relevant, but I suspect it's more than that. The metrified version can't also meet this stringent criterion, but is compelled to at least satisfy MOD(1) = 0.[6] It quickly becomes apparent when studying this phenomenon that the more general case is MOD(*n*) = 0, where (*n*) tries to be an integer with as many trailing zeroes as possible.

I saw that road sign at a time when the Dow Jones Industrial Average® was oscillating around 3650. I found myself referencing its performance against 3700 as if that were some sacrosanct benchmark. Not 3690 or 3703, but the nice round 3700. More recently, passing the 4000 mark for the first time was announced, if not hailed, as a milestone. Never mind that

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Now as anachronistically obsolete as Susan B. Anthony dollars, retired metrified road signs are displayed ironically and prophetically in the company of the American Heritage Dictionary.

the underlying meaning of the absolute value of this index is arbitrary and that it experiences fluctuations large compared to the one that took it over 4000. It was a watershed event. Passing 4100, 4200, and so forth seems terribly anticlimactic.

By now you have undoubtedly anticipated me. The first year of the next millennium which trails three zeroes, will produce the most hysterical New Years Eve celebration in one hundred years.[7] No debate about Gregorian versus Julian calendars or the arbitrary and likely inaccurate definition of year zero will dampen the revelry. A lesser celebration has already accompanied my odometer's achievement of 100,000 miles—a milestone of frugality and rust prevention despite the arbitrariness of the unit and my failure to calibrate my odometer against NIST's standard mile.

So what deep psychological need is satisfied by roundness? Is it the limited capacity of most human minds to store a lot of multiple-digit numbers less important than our own phone numbers?[8] Was the fall of Rome a result of the lack of roundness of Roman numerals, or are Xs as satisfying as 0s? If preference for round numbers rests on ease of mental or back-of-the-envelope computations, why did the electronic pocket calculator not create an anti-roundness backlash? Does the

absence of impact by the calculator mean that the computer revolution must accommodate decimal roundness rather than convert us to the equally pleasing roundness of binaries, octals, or hexadecimals that are also able to trail zeroes? Was the Hundred Years War really 36,500+24 days long? Are pictures really worth 1,000 words,[9] and may they be small words? Do people with well-rounded personalities leave trails of zeroes behind them? Do centipedes and millipedes have the requisite number of feet? Do twelve inches per foot and three feet per yard detract from the roundness of the 100-yard dash in track or runback in football (US)? Not unlike the Ten Commandments, the number of questions in this paragraph, MOD(10), is zero, so it's best to stop here.

We cannot blame the physical world for our attraction to modulo 10. The building blocks of matter have their own magic numbers for nuclear (2,8,20,(28), 50,82,126...) and electronic (2,10, 18, 36,54,86...) shells. Whatever the other merits of roundness, its power to focus the mind has been well exploited by the muse. There are a daunting number of examples to cite, like *a thousand points of friendly light*,[10] but, *a journey of a thousand miles must begin with a single step*.[11] *All this will not be finished in the first hundred days.*

Nor will it be finished in the first one thousand days,[12] and *I know* this exposition *[like] death hath ten thousand several doors for men to take their exits.*[13] Therefore, we exit.

Epilogue: Those who take these observations as a challenge to fight the roundness for roundness' sake trend do so at their peril. For me, the distraction of the discordant combination of round *mph* and roundless *kph* that nearly caused me to drive off the road was enough to dissuade. Never forget *the power of the world always works in circles, and everything tries to be round.*[14] *Creator of our lovely Earth, Most important miracle, Insured great circles round its girth, By casting it as spherical.*[15]

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#*This is the long-delayed sequel to the Posterminaries, "Being Odd: Getting Even," MRS Bulletin, Vol. XVIII, No. 9 (September, 1993) p. 96.*
1. *From Carl Sandburg,* The American Songbag *(1927).*
2. *"Round" as used here should not be confused with its ancestral arithmetic verb, "to round off, up or down." It takes more than dropping the last few decimal places of an unround number to confer roundness.*
3. *The verb "metrify" derives from a program of metrification intended to abolish our British system of units. It is not to be confused with "metricate" from "metrication" which is a newer quality movement term implying measurement of all activities against metrics. Not that the former could not have used some of the latter.*
4. *Somehow this does not seem to contradict my direct intuitive appreciation for centimeters in the lab.*
5. *An equally interesting question to consider is whether one is in violation of the law when cruising below 30 mph but speeding above 48 kph in the twilight zone, $48 < v$ (kph) $<48.28032(29.8258 < v$ (mph) $< 30)$.*
6. *As one might expect in nations really on the metric system, $MOD(5) = 0$ applies to kph.*
7. *Purists will insist that the next millennium will not actually begin until year 2001, but the power of round numbers will drown them out.*
8. *Speaking of phone numbers, most large companies have main phone numbers with three trailing zeroes. Certainly the Fortune 500 need that extra zero.*
9. *Fred R. Barnard in* Printer's Ink, *(10 March 1927) p. 114.*
10. *From:* The Web and the Rock, *Thomas Wolfe (1939) and (without the* friendly*) George Herbert Walker Bush, Republican National Convention, New Orleans, August 18, 1988.*
11. *From* The Way of Lao-tzu *(c.604–c.531 B.C.)*
12. *John Fitzgerald Kennedy, Inaugural Address, January 20, 1961.*
13. *Paraphrased from* Duchess of Malfi, *John Webster, (1623) Act IV, sc. 2.*
14. *Black Elk (Hehaka Sapa) as told through John G. Neihardt,* Black Elk Speaks, Being the Life Story of a Holy Man of the Oglala Sioux *(1961).*
15. *From E.N. Kaufmann,* Circles, *unpublished.*
16. *After* USA Today, *Friday, May 12, 1995, p. 3B.*