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Gooney Ducks and Naked Physicists

Part XLVIII Writing a Wrong: Reversing Pi

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Abstract: An allegory of modern science.

Part XLVIII

*Who is this that darkens my counsel with words without knowledge?
Where were you when I laid the earth's foundation? Tell me, if you understand....
On what were its footings set, or who laid its cornerstone—while the morning stars sang
together and all the angels shouted for joy?*

—The book of Job, chapter 38

After all these years, I can still remember it so clearly. A “blast from the past,” as they say. Images of Dr. Strangelove and the high command—orders from above? They told us to “protect” ourselves by turning our backs, closing our eyes tight, and putting our arms over our eyes. Even so—even ten miles out from Ground Zero—when the Thing went off, I could see the bones in my arms! X-ray vision? For a minute there, I felt like Superman!

Yeah, I saw—“firsthand”—that the atomic stuff works. It works too well. But now to realize that the underlying math is all screwed up? What in blue blazes! Is that a silver lining I see on that mushroom cloud? Maybe there's hope! If we can get the math mess straightened out—maybe, just maybe, we can get the monster under control and pave the way for some real scientific progress, understanding, and peace. A chance for the impossible to become possible!

Cold war, you say? How about some stone-cold peace for a change? Impossible? Well, I've always heard that cold fusion was impossible. But perhaps these “impossibilities” of nuclear science and world peace are really possibilities that rest upon the true “possibilities” of math.

But is it possible to change math into a language of possibilities rather than impossibilities? Lemme see...take the “impossibility” of pi: Dividing the circumference by the diameter? A division that never resolves? And “*unhappily ever after*,” whenever you use pi, nothing resolves and everything becomes impossible? Yeah, they say it's “impossible” to square the circle because it's impossible to resolve pi. But perhaps I should consult an expert in the “impossible”. Time for a sidetrip across the pond to 221B Baker Street:

When you have eliminated all which is impossible, then whatever remains, however improbable, must be the truth. Why, it's elementary, Watson: There is nothing more deceptive than an obvious fact!

I see your point Sherlock! So if squaring the circle is “impossible” because it's impossible to resolve pi, to eliminate the impossible...I simply won't try to resolve pi!

But hold on to your bowler, Watson! I wanna be an innovator. People have been trying to square the circle for centuries. That's old hat! I can one up that...I think I'll square the sphere! So, lads and lassies, here we go!

- The equation for the surface area of a sphere is,

$$A = 4\pi r^2.$$

- As (π) is the ratio of a circle's circumference to its diameter, or ($\frac{C}{d}$),
I can rewrite the equation as $A = 4\frac{C}{d}r^2$.
- And since the diameter (d) is two lengths of the radius, or ($2r$),
I can then write the equation as $A = 4\frac{C}{2r}r^2$.
- Then, dividing by ($2r$), I can produce the equation $A = 2 C r$.
- And again, as 2 times the radius ($2r$) is equal to the diameter (d), the equation for the surface area of the sphere is the length of the circumference multiplied by the diameter,
 $A = (C)(d)$.

Talk about easy, peasy, lemon squeezy! The surface area of a sphere is simply the length of the circumference multiplied by the length of the diameter! Wow! I guess that'd be a rectangle with the circumference as one side and the diameter as the other.

So, time to go on a math diet? Forget about the after dinner sliver! Easy as pi? No! Easy without pi! Pi is where the math goes awry! As long as you don't try to resolve pi, everything resolves: The impossible is made possible! But wait a minute...hang on to your ruler, Euler!

Pi is the circumference *divided* by the diameter: $\pi = \frac{C}{d}$

But would you look at that! Am I see it correctly?

The equation for the surface area of a sphere is the circumference *multiplied* by the diameter:

$$A = C d$$

Wow! *The circumference multiplied by the diameter!* That's the reverse of pi!

Huh...so the great mathematicians throughout the ages have been trying to divide the circumference by the diameter. And now the great scientific breakthrough?

(Lean in close, you don't want to miss this.) The secret to future scientific success?

You have to multiply rather than divide!