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# Gooney Ducks and Naked Physicists

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## **Part X** **Square the Monkey**

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**Abstract: An allegory of modern science.**

## *Part X*

(The phone stops ringing.) I looked at the caller ID—the Hecklemayer sisters. Hilda and Helga. I remember the last case I worked with them. Ended up at the lighthouse on Dungeness Spit. What a night: marooned on the Strait at midnight! But maybe they're just looking for Eva. Girls night out at the Mariners' game; last chance this season to add to their collection of baseball caps and bobble-heads. Now, where was I? Ah, that's right: the "Age of Squares."

Anywhere I look in the equations of calculus and theoretical physics I find myself stumbling over squares: squares of mass, time, velocity of light—squares of everything!

If I didn't know better, I'd think calculus and theoretical physics were a study of squares!

Wow! Laws, theories, and theorems of squares? Now there's a far-out idea!

I guess it kinda makes sense. If the basis of our geometric understanding is the square, naturally any math physical science applies to the universe will be based on the square.

Yep, the square: It's here, it's there, it's everywhere! But wait a minute!

Everywhere I turn, I see squares?

As far as the eye can see, there are hoards of them! Oh no! I can't get away from them!

Aaaah! They're after me! Run for the hills! It's an invasion of the squares!

It's the planet of the squares! No, it's a universe of squares!

Help! SOS! I'm lost in the Science of Squares!

Eva always tells me I go too far. But *everything* squared? All the loose ends of science—everything in the universe—wrapped up neatly, tied together with the square, squaring, and the right angle? The square as the unified field and theory of everything—the mathematical connection between God, man, and basis of physical creation? Now there's a headline:

SCIENCE DISCOVERS THE GOD PARTICLE!  
THE "MISSING LINK" NEVER REALLY MISSING!  
ALL ALONG IT WAS JUST THE SQUARE!

That's the ticket! Go ape! Square everything! Now I can even imagine an equation for evolution. Yeah, square the monkey to create the man!

$$(\textit{Monkey})^2 = \textit{Man}$$

Or maybe

$$\textit{Monkey (time)}^2 = \textit{Mankind}$$

Monkey business? Square Darwinism? Why not?

## Twenty-two

I used to think the iconic “squaring” laws of physics, like those of Kepler and Newton, were unassailable—cast in stone.

But man, after “squaring the monkey,” all bets are off! It’s a whole new ball game!

I looked up Kepler’s laws of planetary motion on the Internet:

1. *The orbit of a planet is an ellipse with the Sun at one of the two foci.*
2. *A line segment joining a planet and the Sun sweeps out equal areas during equal intervals of time.*
3. *The square of the orbital period of a planet is proportional to the cube of the semi-major axis of its orbit.*

Hmm, the first two laws...nothing out of the ordinary there—simple geometry of an elliptical orbit, a right angle axis, and an equivalence of areas during time intervals. Bing, bing, bing!

But the third law...am I reading it correctly?

*The square of the orbital period (the square of time)...is proportional to the cube of the semi-major axis of its orbit.*

Wow! Comparing a square of time to a cube of space?

Applying the exponent to both time and space?

What a radical concept! What a daring dude!

Kepler takes a step beyond the simple geometry of squaring area, dares all, and squares *time*!

So is this where it all started? The space-time continuum, black holes, singularity, relativity, string theory, Star Trek—are they all due to this “squaring of time” in Kepler’s third law?

I read somewhere that Kepler wrote the first “modern” sci-fi novel, *Somnium*—all about how the earth might look from the moon and how it might be possible to travel to the moon.

But talk about imagination and innovation! Great Scott!

Without a wrench or a screwdriver (not even a DeLorean or plutonium), with just an equation for time squared, it looks like Kepler constructed the first sci-fi time machine!

$$t^2 = \text{Kepler's time machine}$$

Yeah, you go, Kepler! You made your mamma proud!

So the theories of modern theoretical physics are just voyages on the time ship *Kepler*?

Space-time: The final frontier?

Wow! Captain Kirk, Spock, Bones, Scotty! Gentlemen...set your phasers to *stunned*!

Looks like Kepler was the first "*to boldly go where no man has gone before*"!

Not to take credit away from others such as Nicole Oresme (who visualized concepts of space, time, heat, etc. as plane figures on a rectangular co-ordinate system, way back in the 1300's), but if Kepler was the first to mathematically compare a square of time to a cube of space, that would give him the unique distinction of being the father of the space-time continuum!

Kepler—the real fuel for those warp-drive engines? The father of all Trekkies? Impressive! But comparing a square of time to a cube of space? What a bizarre mathematical concept! Giving mathematical substance and geometrical form to time? Pretty heady stuff! I guess the theory is, if you could square time, you'd have a way to control, alter, or travel through time. Hmm...time squared: shaking off the shackles of physical reality? Oh yeah! Run, Forest, Run!

Back on the Internet, I found an equation with the square set *equal* to the cube (on metafilter.com, under the heading "It's true because pictures"):

$$(1 + 2 + \dots + n)^2 = (1^3 + 2^3 + \dots + n^3)$$

I can see this equation working as a relationship of numbers. But applying this to square time and cube space? Hmm, I wonder: What math could possibly support the squaring of time?

Comments on the same web page talk about Rene Descartes' innovation of working with squaring and cubing, where  $x^2$  and  $x^3$  don't have to just represent area and volume, but can also represent line and number. Finally! A solid lead!

To verify this, I looked for an e-copy of Descartes' book *Geometry*.

Boy howdy—Descartes certainly had an impressive grasp on everything geometric!

But hold on! Am I missing something here?

All the diagrams appear to be based on the classic theorems of Thales, Pythagoras, and Euclid! None seem to break from the square, the right angle axis, right triangle, and area! Not one!

Wow! Talk about the case of the missing proof: "The Case of the Cartesian Conundrum"!

I think I just stumbled upon one of the great unsolved mysteries of science!

Where's Descartes' proof of squaring a line?

From what I can see, Descartes seems to be proving his "squaring of line" with area proofs.

What's up with that? I think this calls for more investigation!