Epsilon Theory

Notes From the Field

Too Clever By Half

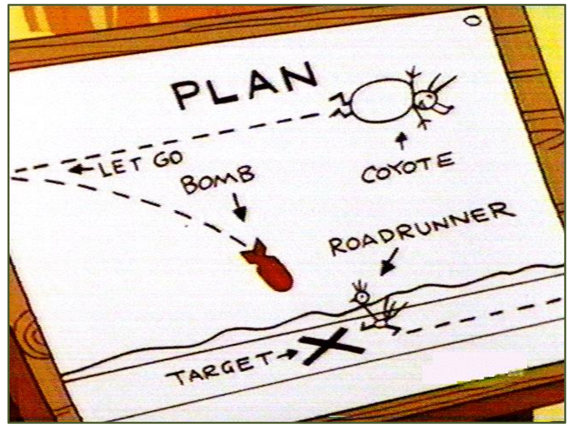
February 5, 2018

The smartest animals on my farm aren't my bees (**although they possess the genius of the algorithm**). **It's not the horses** or the goats or even the dogs. The barn cat is pretty smart, but only in fairly limited circumstances, and the house cats are useless. Obviously **it's not the sheep** or the chickens. Nope, the smartest animals on my farm aren't really on my farm at all. They're the coyotes who live in the woods.

My favorite example? We have a really big invisible fence for the dogs … covers about five acres. Yes, my farm is a great place to be a dog. For those of you who aren't familiar with the technology of the invisible fence, it's a buried wire that transmits a signal to a receiver placed on your dog's collar. When the dog gets close to the wire, the receiver starts to beep, and when the dog gets all the way to the "fence" boundary, the receiver generates a small electric zap. I know, I know … it's negative reinforcement and it's a shock collar and all that. Don't care. It's fantastic for us and our dogs. But whether it's a smart dog like Maggie the German Shepherd or a … shall we say … "special" dog like Sam the Sheltie, after a few weeks (Maggie) or a few hours (Sam) they will forget where the fence exists if they stop wearing the collar.

Not so the coyotes.

The coyotes know *exactly* where the invisible fence begins and ends, without the benefit of *ever* wearing a shock collar. How do I know? Because they intentionally leave their scat on their side of the invisible fence, creating a demilitarized zone as precise and as well-observed as anything on the Korean peninsula. Occasionally a coyote will try to test our dogs by leaving its scat juuusst over the line on our side of the DMZ. Our dogs, of course, just blithely ignore the provocation, not even knowing that they're being challenged. My dogs are the Roadrunner in some real-life *Looney Tunes* competition with Wile E. Coyote, super-genius. The coyotes are scheming; my dogs have no idea what scheming is.



I feel bad for the real-life coyotes in exactly the same way that 7-year-old me felt bad for Wile E. Coyote and 30-year-old me felt bad for The Brain (not a coyote, of course, but still). They put SO MUCH EFFORT into their plans and machinations for taking over the world, and it all comes to naught in a world of Roadrunners, Pinkys, and dogs like my Sam the Sheltie.

I see myself in the coyotes. So do most people reading this note, I bet.

Brain: Pinky, are you pondering what I'm pondering?
Pinky: I think so, Brain, but if Jimmy cracks corn and no one cares, why does he keep doing it?

Brain: Pinky, are you pondering what I'm pondering?
Pinky: I think so, Brain, but Pete Rose? I mean, can we trust him?

Brain: Pinky, are you pondering what I'm pondering?
Pinky: I think so, Brain, but culottes have a tendency to ride up so.

Brain: Pinky, are you pondering what I'm pondering?
Pinky: I think so, Brain, but if you replace the 'P' with an 'O', my name would be Oinky, wouldn't it?

For the canonical compilation of all *Pinky and the Brain* "pondering" quotes, see Richard Watanabe's magisterial site.

The truth is that domestication makes any animal dumb. You name the species — dogs, cats, cows, horses, sheep, pigs — human selection on "tameness" for thousands of years accumulates a wide array of traits, including floppier ears, shorter snouts, hair color variability and the like, most likely based on more basic inherited alterations in certain stem cell and stress hormone production patterns (see *Domesticated: Evolution in a Man-Made World,* by Richard Francis, for a great read on all this). Different species show these external traits to different degrees. **But the trait that ALL domesticated species demonstrate relative to their wild species is a smaller brain.** I'd bet it's happening with humans, too, but that's just an observation for another day.

Unfortunately, coyotes are too smart for their own good. They are, to use the wonderful Brit phrase, too clever by half. They are, to use a post-modern, TV reality show lingo, not good in the meta-game. And the meta-game has turned against the coyotes with a vengeance.

Case in point — in our pre-farm life, where we had a yard like any other yard and were part of a neighborhood like any other neighborhood, we still had run-ins with coyotes. There were three or four of them roaming around one fall, coming in from the local nature preserve, and it became something of an issue in our small town. Warnings went out on mom chat groups not to let your small children play outside alone, much less your small dog or cat (yes, this was back in the day when it was not a blatant act of animal cruelty in Fairfield County, Connecticut to let your house cat go outside when it wished). Fortunately, clear instructions were provided through various channels as to how to protect your family.

> *Don't yell at the coyotes. Half fill an empty coffee can with loose change and shake it at them. This will frighten them and they will run off.*

Again, this is Fairfield County, Connecticut, where even owning a BB gun is enough to earn a lifetime ban from any play dates for your kids. It's a far cry from growing up in Alabama like me or Texas like my wife, but when in Rome …

A few afternoons later the coyotes came wandering around our yard. We had (very) small kids at the time. So my wife dutifully brought out the coffee can she had prepared, and rushed out into the yard to confront the coyotes, shaking the coffee can like a madwoman. At which point the lead coyote, a female we think, sloooowly looked up and just stared at my wife. It wasn't scared. It wasn't frightened. It recognized immediately that there was absolutely zero danger posed by this human female gesticulating wildly and making a bizarre clanking sound with her hands. The message from that coyote's stare was clear — *is that all you got? Really?* Almost derisively, the lead coyote sloooowly turned around and sauntered back towards the woods, leading the others away.

It was an alpha move. Smart, cool, totally in command. *I'm leaving because I want to, at my own speed, and only because you're annoying me with that ridiculous noise, not because I'm scared.*

It was also a really dumb move for the meta-game.

What's the meta-game? It's the game of games. It's the larger social game where this little game of aggression and dominance with my wife played out. The meta-game for coyotes is how to stay alive in pockets of dense woods while surrounded by increasingly domesticated humans who are increasingly fearful of anything and everything that is actually untamed and natural. A strategy of Skirmish and scheming feints and counter-feints is something that coyotes are really good at. They will "win" every time they play this individual mini-game with domesticated dogs and domesticated humans shaking coffee cans half-filled with coins. **But it is a suicidal strategy for the meta-game.** As in literally suicidal. As in you will be killed by the animal control officer who HATES the idea of taking you out but is REQUIRED to do it because there's an angry posse of families who just moved into town from the city and are AGHAST at the notion that they share these woods with creatures that actually have fangs and claws.

The smartest play for coyotes in the meta-game is never to Skirmish with humans. Never. And if you find yourself in a Skirmish-with-Humans game, then the smart play is to act scared, to run away at top speed from a jangling coffee can. But no, coyotes are too clever by half, plenty smart enough to understand and master the reality of their immediate situation, but nowhere near smart enough to understand or withstand the reality of their larger situation. It's their nature to play the scheming mini-game. They can't help themselves. And that's why the coyotes always lose. **It's always the meta-game that gets you.**

Okay, Ben, entertaining as ever, but where are you going with all this?

Almost there. Before I pull this charming discussion of too clever by half coyotes back into the real world of markets, there's one other (supposedly) clever, non-domesticated animal I need to introduce into this story. That's the raccoon.

Coyotes have a roguish charm and bring something interesting to the world with their independence and scheming. **Raccoons are simply criminals.** And they're not that smart. I'd put our barn cat up against a raccoon any day on any sort of cognitive test. We think raccoons are clever because they have those anthropomorphic paws and those cute little masks and even a Marvel superhero with its own toy line, but please. Raccoons are takers, not schemers. They're killers, often for the sheer hell of it. Raccoons steal and kill way beyond what they need, and they do so in a totally wanton, non-clever way. I hate raccoons.

When they push their scheming and stealing too far, coyotes and raccoons ALWAYS end up getting killed by the farmer — regretfully in the case of coyotes, remorselessly in the case of raccoons. It's not a cute *Looney Tunes* death, either. There's no little puff of smoke and immediate reincarnation for these Wile E. Coyotes and Rocket Raccoons. Just blood and sadness.

That's true on the farm and it's true in the real world, too. And that's how we pull this allegory together.

Every truly disruptive discovery or innovation in history is the work of coyotes. It's always the non-domesticated schemers who come up with the Idea That Changes Things. We all know the type. Many of the readers of this note ARE the type.

Financial innovation is no exception. And this is Reason #1 why financial innovation ALWAYS ends in tears, because coyotes are too clever by half. They figure out a brilliant way to win at the mini-game that they're immersed in, and they ignore the meta-game. Eventually the meta-game blows up on them, and they're toast.

Reason #2? **Financial innovation, more than any other sort of innovation, attracts the raccoons — con men and hucksters at best, outright thieves at worst.** They infest financial innovation. And they can't control themselves, so they always push it too far. They're never content with stealing a little. Or even a lot. No, raccoons want it ALL.

Example, please.

Financial innovation is always and in all ways one of two things — a new way of securitizing something or a new way of leveraging something.

Securitization is a ten-dollar word that means associating something in the real world (a cash flow from a debt, an ownership interest in a company, a deed on a property, a distributed ledger mathematical calculation, etc.) with a piece of paper that can be bought and sold separately from that real world thing.

Leverage is a ten-dollar word that means borrowed money.

That's it. **There's nothing new under the sun.** Finding new ways to trade things (securitization) or new ways to borrow money on things (leverage) is what financial innovation is all about, and there are vast riches awaiting the clever coyotes who can come up with a useful scheme on either.

The biggest market disasters happen when both leverage and securitization get mixed up with the same clever scheme, as when new ways of leveraging and securitizing U.S. residential mortgages were developed in 2001, resulting in the creation of a $10 trillion asset class that utterly collapsed during the Great Financial Crisis. There were a lot of coyotes involved in so gargantuan an Idea That Changes Things, but most illustrative for these purposes is the Gaussian Copula formula published by David Li in 2000, the "technology" which allowed the securitization of pretty much any mortgage portfolio (prior to this most securitization was limited to "conforming" mortgages securitized by Fannie Mae and other government-sponsored mortgage agencies) *and also* the leveraging of those securities through tranching (splitting up the security into still more securities, each of which can be used as collateral for more borrowing, particularly those tranches with higher credit ratings). I wrote a bit about the Gaussian Copula in "**Magical Thinking**", and if you want to learn more you can't do better than Felix Salmon's 2009 *Wired* magazine article — "**The Formula That Broke Wall Street**" — still my all-time favorite piece of financial market journalism.

Here's the core Gaussian Copula code and a headshot of the OG coyote himself, David Li:

$$C_g(u,v,\rho)=\int_{-\infty}^{\Phi^{-1}(u)}\int_{-\infty}^{\Phi^{-1}(v)}\frac{1}{\sqrt{1-\rho^2}}e^{\left(-\frac{r^2+s^2-2\rho rs}{2(1-\rho^2)}\right)}drds$$

The formula doesn't look like much, does it? But this little equation made *billions* of dollars in profits for Wall Street through hundreds of clever coyote schemes. More than a few raccoons got involved along the way. **And then it broke the world in 2008.**

It's what I'll call "coyote-math". The math behind ~~blockchain and Bitcoin~~ the Gaussian Copula and non-agency residential mortgage-backed securities (RMBS) is undeniable. It is a mathematical certainty that these securities "work". Unless, of course, you have ~~a government-led chilling effect on exchanges and network transactions~~ a nationwide decline in U.S. home prices, in which case ~~Bitcoin~~ non-agency RMBS doesn't work at all.

So what ~~will~~ does the aftermath of this classic example of financial innovation gone awry look like?

~~Blockchain~~ The Gaussian Copula is still around. These things don't get un-invented, and it's still a very useful piece of code for certain applications. The truth about ~~blockchain~~ the Gaussian Copula is that it's an Idea That Changes Things In a Modest Way, not an Idea That Changes Everything. It's a modern algorithmic twist on **~~letters of credit~~** portfolio risk, and there are a few interesting uses for that. Just a few, but that's okay. That's still important. Just not as important as ~~HODLers~~ Wall Street thought it was.

As for the primary financial application that ~~blockchain~~ the Gaussian Copula spawned, ~~Bitcoin~~ non-agency RMBS is still around, too. The securitization of ~~distributed ledger calculations~~ non-conforming mortgages is something that market participants still want and still trade. It will NEVER be a $10 trillion asset class again, because the inherent flaws of this security have been well revealed. Turns out that ~~Bitcoin~~ a AAA-rated tranche of Alt-A mortgages wasn't the store of value that coyote-math "proved" it was, to the detriment of ~~individual~~ institutional investors who put a significant portion of their portfolio into these securities, and to the ruin of those who used leverage to acquire these securities.

Many of the coyotes involved with this classic example of financial innovation gone awry are (professionally) dead. At the very least careers were permanently derailed, and entire coyote institutions, like Bear Stearns, ~~were taken out into the street and shot in the head by animal control officers~~ were merged into healthier financial institutions by government regulators ~~as an example to other coyote institutions~~ as a necessary measure for systemic stability. I miss Bear Stearns. The world is a poorer place for Bear Stearns not being in it.

Surprisingly few of the raccoons involved are (professionally) dead. In fact, more than a few of the financial hucksters involved with the run-up to the Great Financial Crisis are back to their old tricks with ~~cryptocurrencies~~ whatever the latest coyote innovation might be. This makes me *VERY* angry, and probably colors my view on ~~blockchain~~ financial innovation more generally. I wouldn't miss the raccoons for a second if the animal control officers took them out, but somehow they never do.

And that brings me to what is personally the most frustrating aspect of all this. **The inevitable result of financial innovation gone awry, which it ALWAYS does, is that it ALWAYS ends up empowering the State.** And not just empowering the State, but empowering the State in a specific way, where it becomes harder and harder to be a non-domesticated, clever coyote, even as the non-clever, criminal raccoons flourish.

That's not an accident. The State doesn't really care about the raccoons, precisely because they're NOT clever. The State — particularly **the Nudging State** — cares very much about co-opting an Idea That Changes Things, whether it changes things in a modest way or massively. It cares very much about coyote population control.

When coyotes play the Skirmish game, that's all the excuse the State needs to come swooping in. And that's exactly ~~what is happening with Bitcoin~~ what happened with non-agency RMBS.

What's the alternative to playing Skirmish in the meta-game?

It's this: to be an arborist.

It's this: to be as wise as serpents and as harmless as doves.

Coyotes can change the world. Coyotes WILL change the world. But not if they misplay the meta-game. Not if they hang out with raccoons. Not if they fetishize ANY financial instrument as an intrinsic aspect of a commitment to liberty and justice for all. Because it's not.

Render unto Caesar the things that are Caesar's. Wise words 2,000 years ago. Wise words today.

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