Evolution 2.0 Newsletter
August 2020

Cancer Evolution and the Late Laura Middleton

Last November I held a seminar in Sydney, Australia. Afterwards I rented a bicycle and blew off some steam on Sydney's bike trails.

I'm tooling along in a huge, gorgeous park in the middle of town and get a text from my friend Bill Middleton. Bill is a long-time friend, client and confidant. His wife Laura is a fitness trainer. Not long ago she did a splendid job organizing Bill's 60th birthday party.

Bill's group text included several other friends:

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Hey guys, Laura's got pancreatic cancer.
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I stopped pedaling and sat under a tree. I called Bill, thinking *oh this is not good*. My friend Tom Hoobyar died of pancreatic cancer a few years ago. It was harrowing and fast. Your pancreas is a vital organ. When it goes bad, things get ugly quickly.

Then in December, back home, I'm riding once again near Loyola Medical Center and I knew Laura had checked in. So, I went to the hospital and hunted them down.

Laura was just starting these treatments and Bill was trying to be strong. Christmas season was upon us. He tells me, "We're starting this radiation and hopefully this will work."

Most of us have had an experience with the cancer roaster coaster. My first was when my dad got cancer when I was fourteen. He died at 44. Cancer is a monstrous energy and money suck. But we humans seem hardwired to climb on that roller coaster anyway. We can't help ourselves. Even if there's just a "12% chance," we lunge at it like a winning lotto ticket. It's a "bleeding neck" which is why every marketer can well understand why we are so willing to throw stacks of money at a problem so insurmountable.

I'm walking through the hospital, struck at how alien an environment this vast institution is. I'm trying to imagine what it would be like to work in a hospital, because I'm an entrepreneur and work at home. All these people in white coats, exquisitely mopped floors, nursing stations, and insanely expensive equipment. It hums like a giant beast demanding to be fed.

I used to sell industrial equipment, so when I look around, I can well guess how much this stuff costs. I feel the heat of hundred-dollar bills in the incinerator. Highly paid professionals performing complex routines. It's a machine that chews up resources…whether it's solving the problem or not. It just has to *look* like it's solving the problem.

Everybody trusts doctors, because doctors are way smarter than the rest of us, right?

Thus the lumbering cancer robot grinds away.

But doesn't solve the problem.

Friends donning COVID masks held a social distancing prayer vigil for Laura on their front lawn on an April Sunday morning. She passed a week later.

Stick with me. Because this has *everything* to do with Evolution.

Where we're at with cancer: If you catch it really early, three-fourths of the time you can knock it out. But if it gets to stage three or stage four? **You're chances of survival are no better today than they were in 1930.**

In fact, if I went to the doctor tomorrow and they said, "Perry, you've got stage three cancer," I might try nutrition and holistic approaches. I would ask my friends to pray extra hard. But I'm not sure I would touch chemo or any of the conventional stuff with a ten-foot pole. Near as I can tell, they just make you miserable and extend your life maybe three weeks.

As Azra Raza explains in our interview (www.evo2.org/azra), *this* is the quarter-trillion-dollar elephant in the room. Most cancer research is money poured into a big black hole. Most of the resources are going in totally wrong directions. A lot more of it should be going into early detection.

So… what does cancer have to do with evolution?

Here's what. Cancer is when a group of cells forgets who they are. They forget they are YOU. "We have formed the rebel alliance. We're going to build our own little empire and take down the whole system!" Then the evolutionary machinery of your own body turns against you.

When your immune system detects these rebels, it starts attacking them. When the rebel alliance gets attacked, it *evolves.*

One of the signature arguments in the *intelligent design vs. evolution* dispute centers on the Cambrian Explosion 500 million years ago. Before this time, there were only simple creatures like mollusks. But after this explosion, a panoply of highly sophisticated invertebrates appear in the fossil record, virtually out of nowhere. In an evolutionary blink of an eye. An explosion of species with few "transitional forms."

Not a gradual, stepwise evolution from one similar form to a slightly more complex form. Nope. BAM! Sudden, dramatic appearance of very complex organisms. Yes, some transitional forms… but not many.

Quite a few of the intelligent design guys insist this is smoking gun proof that these new life forms didn't evolve from mollusks; it's evidence for divine intervention. Evolutionist Stephen Jay Gould called this "Punctuated

Equilibrium" which basically means "Everything stays the same for a very long time… then new species appear at lightning speed."

I wouldn't exactly say Gould did a great job of explaining *how* this was accomplished. In fact there's been a great deal of hand-waving, evasive arguments and mumbling of excuses around this question.

At first I was sympathetic to the creationist view. Engineers often are. But I became persuaded that not only was high-speed evolution possible, it happens all the time. As in *right now*. Chapter 17 of *Evolution 2.0* presents my take on the Cambrian. But there's an even better case for high-speed evolution than that.

Turns out a major puzzle piece is found in… cancer.

Ken Pienta at Johns Hopkins says a process very, very similar occurs with cancer inside your body. In fact, he even calls it the "Cancer Cambrian" in a recent paper in *Molecular Cancer Research.*

Here's what happens. Suppose you get a spot on your liver, a nodule of cancer cells. Suppose your doctors determine that it's too big to operate on. They decide, "We're gonna target this with chemo."

Guess what happens when you assault the rebel alliance with chemo: The chemo triggers a Cancer Cambrian Explosion right inside your own body. In just a few weeks, your liver can go from a handful of species of cancer cells…to a **thousand species of cancer cells**. And every single species has a different physiology. It has a different structure. Different genetics. And that happens in response to the chemical attack.

Battling one species of tumor cell? No big deal.

Battling 1,000 species of tumor cells? Impossible.

This gets us to precisely what traditional evolutionary theory always got wrong about traditional evolution and cancer evolution: It's not "willy-nilly." The evolution of cancer cells is an *intentional* response. It is *strategic*. The renegade cells possess a better plan than your doctor does.

It's 1971. You're in Viet Nam. A coven of Viet Cong rebels is doing their own thing. They are not under any one centralized authority. They're trying to survive and fight back any way they can figure out. And they're willing to do… anything. They'll use machine guns. Hand grenades. Bamboo sticks. They'll torture enemy soldiers. They'll steal weapons or jeeps or helicopters or whatever they can lay their hands on. *Anything*.

Cancer cells operate the same way after the "Cancer Cambrian." They'll try anything they can think of to survive and adapt and fight. They recruit blood vessels to send more blood. They steal nutrients from your healthy organs. They give you sugar cravings. They *massively* restructure their DNA on a global scale. They "split test" hundreds of newly minted mercenary soldiers, hunting for ways to hack the chemo and your immune system.

Cancer docs call this explosion *metastasis*. Tumors. Clumps of myriad species of cells gone crazy. It's why tumors are so ugly. Cancer is a freight train run off the rails, smashing through your quiet neighborhood, ripping through houses and Starbucks stores and office buildings.

Some evolutionary scientists believe the Cambrian Explosion was a response to a huge drought. That was the "pressure" that triggered the explosion. In drought, simple animals could not retain enough water to survive. More sophisticated animals, with more layers of skin and more complex circulatory systems, could use water much more efficiently. Evolutionary machinery got triggered and the explosion of new species began.

Remember: the Neo-Darwinist theory of evolution – the version you read in high school and college freshmen textbooks – insists all this happened randomly, purposelessly.

Wrong. It was an active cellular response to outside pressures. The development of new features was directional strategy in the face of threat. It was not just "natural selection." It was *smart*.

Same with cancer. Every cell has its own toolkit. They use that toolkit to make evolutionary decisions; in my book I call it the "evolutionary Swiss Army Knife." We barely understand it. We've radically underestimated it.

A colony of cancer cells is smarter, in some sense, than all medical doctors and all scientists alive today. If cancer can evolve 1,000 species of tumor cells in six weeks, just think what the evolutionary toolkit could accomplish in 40 million years?

Our misunderstanding of cells and how they adapt is one reason cancer treatment is so ineffectual. It fails to realize that, in a sense, the "cure" is CAUSING even more cancer.

Most doctors and scientists are told ad nauseum cancer evolves by accident; then occasionally there is a "beneficial" mutation that allows it to survive. This was drilled into their heads in biology and evolution classes.

But it's no accident.

Imagine you are fighting a war against an enemy, and you assume every time they attack you, it's just random and accidental. "What? A bomb exploded a shopping mall? Oh, I'm sure that was an accident. It probably won't happen again."

How pleased (and powerful) would your enemy be if they knew THAT was your perspective???

I am not even beginning to suggest cells are all-knowing. But they sure aren't stupid. They are very, very good at making educated guesses of what *might* work. Just like us, they're thankfully wrong most of the time. But those buggers that manage to guess right it right, the savvy ones are survivors. We're fighting the smartest cells. And they keep getting smarter.

There's an old joke that goes, "They say drinking booze and taking drugs kills brain cells…yeah but only the WEAK ones!" Well it's certainly true of cancer treatment. Chemo kills the weak cells. You go in for an MRI and the oncologist tells you the tumors have shrunk 75%.

It's party time. Everybody celebrates. The exuberant Facebook posts travel like wildfire.

But the chemo didn't kill the strong, smart ones!

Ten weeks later it's metastasized. It's in lungs and lymph nodes and you've got four months to live. Cancer is like that deranged scowling clown from a Stephen King novel: *Welcome back to the cancer roller coaster. We missed you.*

When we attack cancer with chemo and other napalm-like weapons, and then they "explode," the war is pretty much over.

What's the answer? As I mentioned earlier, far more cancer efforts should be focused on early detection.

But what about stage three and four? What about inoperable cancer?

That's one of things we're addressing at the Cancer & Evolution Symposium:

www.CancerEvolution.org

Over a decade ago, scientist Henry Heng at Wayne State University in Detroit reached the conclusion, *simply based on his own cancer research*, that the modern theory of evolution *had* to be all jacked up. He offered a better model and wrote a book. His manuscript was well on its way to getting published as a large expensive textbook by a major academic publisher.

But one of their old school Neo-Darwinist peer reviewers threw a fit. The book got canned.

Fast forward to 2019 and his book gets rehashed, rewritten, re-released under the title *Genome Chaos*. It explores the overlooked details of how cancer cells evolve. After publishing his book, Henry got in touch with James Shapiro, a well-known geneticist from the University of Chicago who had earlier published a book with a similar perspective on evolutionary change in 2011 with the title *Evolution: A View from the 21st Century.* (James is my own #1 influence.) James had just met Frank Laukien, CEO of Bruker, a billion-dollar scientific instrumentation company, who wasworking on **his** own evolution book. It's broadly similar to my own *Evolution 2.0*, but technically far more detailed. It's called *Natural Evolution 4.0: Feedback-Driven and Actively Accelerated Biological Evolution.*

Thoroughly researched, expertly written. It's for PhDs, not laypeople. Frank and James decided that the best way to make all these novel perspectives more widely known was to organize a cancer and evolution symposium to show how understanding the true punctuated nature of evolutionary change could have practical benefits. They reached out to Henry and me me and said, " Henry and Perry, would you help us put together a cancer conference?"

It will be in Boston, Massachusetts, October 14 to 16, exact location TBA. Because of COVID, it will all be broadcast online. I'm guessing two thirds of the speakers will present from remote locations. You might be able to attend in person, depending on how the pandemic goes, but you should definitely attend online and get the recordings.

We've brought together some of the smartest cancer researchers in the world, many being *both* renegades and rock stars. Most presenters agree that we've gotten the evolution story wrong. And we've got to get it right if we're ever going to solve cancer.

If you've been following this project, you'll recognize names like George Church (Harvard's leading geneticist), Denis Noble (Oxford's leading physiologist), Azra Raza (Columbia oncologist in New York, author of the bestselling book *The First Cell*) and Paul Davies (world renowned physicist and leader of the Beyond program at Arizona State University). All are presenting. A synopsis from the conference will be published in a peer reviewed science journal in 2021.

I'm presenting as well. If all goes according to plan, it will be my first formal scientific publication. My presentation, I predict, will update information theory from 20th century conceptions and pinpoint the unanswered questions are in biology. It has a fair bit of overlap with the technology prize. But it's also about how and why biology does things computer programs and man-made technology cannot do.

I make that case that biology makes choices. I'm defining it in scientific and engineering terms. A computer *computes* a one or zero, but biology *chooses* a one or zero. I'm so excited about it and I'm also expecting to ruffle a few feathers. We're OK with ruffling feathers at this conference.

The symposium is squarely aimed at scientific people, but lay people are certainly welcome to attend. If you're a layperson, you'll may only understand 25% of what they're saying, but that might be plenty. And it will be affordable ($99). Each presentation is 15-25 minutes long and we have about two dozen speakers from Harvard, Yale, University of Chicago, MIT, Johns Hopkins, Oxford, M.D. Anderson, National Cancer Institute and other elite institutions.

Many presenting at the Cancer and Evolution Symposium are on the front lines of attacking the Stage 3 and Stage 4 problem. And, in my estimation, they are more accepting of the magnitude of this challenge than the rest of the profession. One person told me, "All those other cancer meetings are the same. Endless presentations about *chemical interaction X* and *therapeutic protocol Y*. But all they do is take last year's trendy approach and copy/paste this year's. It's the same story over and over again. But you can't reduce cancer to any single mechanism. It's guerrilla warfare."

There is no formula. There might be patterns, but no formula. Cancer does not follow a playbook. It constantly rewrites its own playbook, generates new playbooks and steals playbooks!

This will require new levels of thinking. Once I had a conversation with a cancer researcher who told me, "Cancer cells like to be talked to." I still don't know what to make of that. But it is somehow believable. It reminds me of visionary biologist Barbara McClintock imagining climbing inside the cell and reading its mind… which inspired her to ask in her Nobel Prize paper: "What does a cell know about itself?" Solving cancer takes rebels and mavericks.

Cancer is like a smart phone app that updates itself, if you can imagine such a thing. We don't know *how* that would work... at all. You can read *Evolution 2.0* and get a kindergarten, crayon drawings version of how cells evolve. But do we really understand exactly how they do it? Not even close. The notorious physicist Richard Feynman said, "What I cannot create, I do not understand." No machine learning even comes remotely close to what cancer can do.

Materialistic thinking, which prevails in the scientific and medical community, will never reach an answer. Because we're not talking about something that can be broken down into smaller and smaller parts. We're talking about an architecture, a superstructure, a global strategy. So the solution is more likely to come through a viewpoint that regards this system holistically.

The mainstream scientific and medical professions embrace *reductionism.* Reductionism is the idea that if you break things down to their component parts, you eventually understand everything 100%. Mainstream science scorns holistic thinking.

I'm an engineer. Nobody appreciates reductionist thinking more than engineers, because when Intel builds a computer chip, they simulate literally every single bit on a supercomputer. They predict *exactly* how it will work in advance. This is exhibit "A" of reductionism. But we also know that reductionism only gets you so far in the real world of building REAL technologies and solving real problems. You're going to also need imagination and creativity.

James Shapiro, an evolutionary biologist, is going to show why studying cancer is arguably a better way to understand evolution than by studying…evolution! Because cancer is a living force of nature in real time. Not a bunch of fossils in the ground.

I suspect there's a trick to keeping that "Cambrian Explosion" tripwire from ever getting tripped. My prediction is that we need to stop thinking of cancer in terms of warfare. Instead, we have to start thinking of it in terms of persuasion. As odd as that may sound.

I don't know what that implies, medically speaking. But we need to let our imaginations run in that direction.

Another presenter is Paul Davies, an eminent physicist from Arizona State University, who invited me to ASU in 2017 to announce the Evolution 2.0 prize. I admire his work. Paul got a phone call some years ago from a cancer research society. They said, "Hi, we wanted to see if you might consider doing some cancer research for us."

Paul says, "I don't know anything about cancer." And they said, "Well, that's exactly why we want you!" They reasoned that a world class physicist would be very good at breaking problems down, isolating them, looking at things from a new angle, escaping the echo chamber. They said, "We would like you to take a fresh approach."

So he and Kimberly Bussey started looking at cancer patterns. They found certain genetic patterns happen over and over with cancer cells. And they look a *lot* like something that appears in bacteria about 600 million years ago! And through this discovery they reasoned that cancer is an ancient response to stress.

It's like when you do a hard shut down on your laptop, and when you turn it back on, it wakes up in Windows safe mode. The early stages of cancer are a lot like Windows safe mode. The cell has switched from a modern, sophisticated motivation to an ancient, self-protective mode of operation. Then when you attack it, it flips into evolutionary gear and starts rewriting itself.

In my business newsletters, I often talk about how, when you have a room full of people all from the same profession, all working from the same assumptions, you rarely get breakthrough ideas. Since you're in an echo chamber, you might get incremental improvement. Ideas that will move the needle slightly.

But you'll never get revolutionary, paradigm-shifting ideas that get to what I call the "bottom of the swamp" of the particular problem.

For that, you need people from outside your industry, outside your framework, outside your discipline.

We need revolutionary ideas for solving cancer. But instead we've insisted on clutching tight to the old ways of thinking and heaving shovelfuls of cash into the firepit.

Cancer is LITERALLY life and death. At last check, over half a *million* people die from cancer every year in America alone. We want to halt that. This conference will be the first shot fired in the revolution…and it will be fired very near Lexington and Concord, as it turns out!

What Can You Do to Help?

Evolution 2.0 is me, my personal assistant Lorena Ybarra and volunteer Sam Bart. Plus a few other precious volunteers to contribute hours here and there. **We can use your help.**

One thing you can do to help is fund the conference. It's 501c3 not for profit, so you can go to CancerEvolution.org and make a tax-deductible donation. SPECIAL OFFER? VIP? BACKSTAGE PASSES?

We could also use some volunteers.

We need people who are skilled or literate in…

- Administration and project management
- Finances
- Scientific papers, research, and projects
- Film (documentary screenwriters, editors)
- **All** forms of marketing (ad copywriting, buying Google, YouTube and Facebook traffic, writing blog posts, shooting videos, podcasts, publicity opportunities)
- Project management

If any of the above piques your interest, please reach out and let us know. Email evolution@evo2.org and let us know what your skills are and how you might like to help.

This is world-changing work. I believe that in 100 years everybody is going to acknowledge how important this work is. I believe that down to my toes.

But it's not easy to get people to see how far-reaching this is. Most people can't see past their next Facebook post. But we are shifting the foundations of civilization. We are moving the foundations of science. We're shifting the foundations of medicine.

And we could potentially save millions of lives. Maybe the life of someone you love. Maybe *yours.*

I dream of a day when the text messages like Bill's sad news about Laura Middleton are no more.

Carpe diem - Seize the day.

Perry Marshall