

Jonathan Schechter – “Corpus Callosum” Column
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Dear Alex,

Nearly four years ago, I wrote as you headed off for college. Twelve days ago, your graduation from Grinnell marked the beginning of the next phase of your life. Today, I thought I'd bookend my “entering college” letter with one about entering the “real world.”

As I see it, during your lifetime, the world will face three fundamental-yet- interconnected challenges: sustainability; bridging the rapidly-increasing gulf between how fast technology changes and how slowly humans and our institutions do; and reconciling knowledge and belief.

At the heart of all three lies science, in particular its applied aspect: technology.

Oversimplified, the Industrial Revolution marked the beginning of the Technologic Age, that period when humans began systematically applying science to exploit nature's bounty. This effort has been a spectacular success. When the Industrial Revolution began, things you and I take for granted – safe and abundant shelter, water and food; worldwide travel; access to information and the tools to make sense of it – were unavailable to even the wealthiest of men. Today, billions enjoy such bounty.

On a more personal level, when your great-grandparents were born, Jackson Hole was uninhabitable in winter. Skip ahead a couple of generations, and thanks to technological advances, people were living here year-round. However, in your case, far more important was that technology had advanced on other fronts as well – had I been born a generation earlier, pyloric stenosis would have killed me before I was two weeks old.

So, thanks to technological advances, you were able to be born and raised in Jackson Hole. However, because life offers little that is purely good or purely bad, the downside of the Technologic Age is that it has allowed humans to fundamentally disrupt the earth's natural processes.

In particular, before the Industrial Revolution, the earth's systems evolved pretty much in balance: one system's outputs became another's inputs, and barring a cataclysm, no one system got too far out of sync with any other. The Industrial Revolution changed all that, for it allowed humans to create outputs (i.e. waste products) far faster than other systems could process them (i.e. faster than other systems could evolve to treat that waste as feedstock).

Almost every form of pollution is due to this phenomenon. Take, for example, the current BP fiasco in the Gulf of Mexico. Small amounts of sub-surface oil have always leaked into the ocean, but been broken down by the microbes which use it as a food source. The BP leak, however, has put far more oil into the ocean than nature has ever dealt with before. For the Gulf's population of oil-digesting microbes, this is a bonanza - their population is multiplying rapidly. However, as that population grows, it's sucking increasing amounts of saturated oxygen out of the water, creating dead zones uninhabitable by the sea life which depend on that oxygen.

Similarly, because oil inundating the Gulf's tidal marshes is not part of the natural cycle, no systems have evolved to deal with it. And since industry has focused far more on how to extract oil than how to clean up spills, things are going to be ugly there for a long, long time.

I mention all this because the increasing imbalance between humans' ability to create waste and nature's ability to deal with it will be a huge, huge hallmark of your adult life.

Put another way, addressing this imbalance is what sustainability is all about. Your forebears have done

a very good job in harnessing nature to significantly improve life, but they've also pushed the attendant problems off into the future, basically leaving it to nature and/or as-yet-undiscovered technologies to deal with the problems they created. That approach has kinda-sorta worked but, unfortunately, so much waste is now being created – and created so rapidly – that pushing off problems is becoming increasingly untenable. So, more than any previous generation, yours will have to figure out how to span that ever-widening gulf between creating waste and dealing with it. Happily, in the great symmetry of life, spanning that gulf is also a great opportunity, the one by which future generations will judge you.

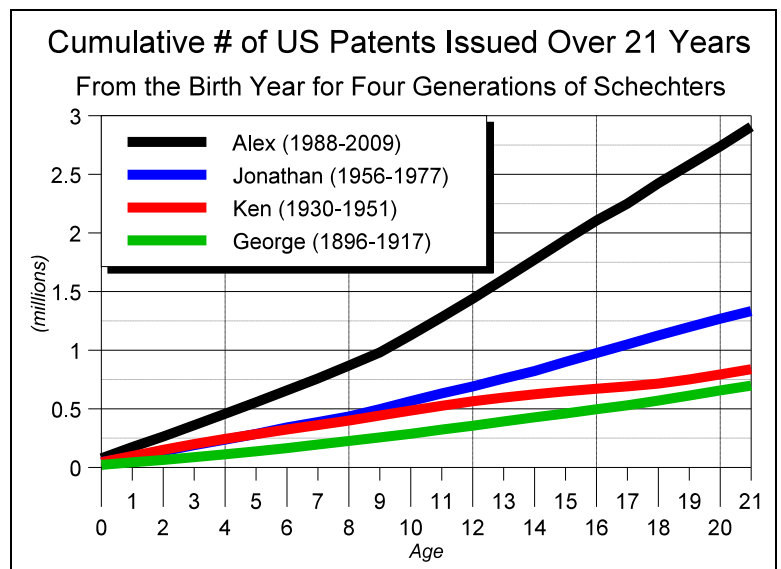
The second quality which will define your world also involves an ever-widening gulf. This one's between the pace of technological change and how rapidly humans and human institutions can adapt to it.

Consider some basic numbers. Let's assume the pace of change is roughly correlated with the number of patents issued. During your 21 years of life, 2.9 million patents have been issued, 38 percent of all the patents ever issued in America. In contrast, during my first 21 years, 1.3 million patents were issued. For Granddad, it was 838,000; for your great-grandfather, it was 698,000.

Do the math, and during my first 21 years, nearly as many patents were issued as during the first 21 years of Granddad's life and your great-grandfather's life combined. Do the math again, and during your first 21 years of life, more patents were issued than during the first 21 years of my life, plus Granddad's, plus your great-grandfather's. (Graph 1)

Why does this matter? Because, from an evolutionary perspective, humans aren't very well equipped to deal with rapid change. We haven't had to be, for until the Industrial Revolution, things didn't change very quickly.

By extension, our institutions are also not very good at adapting to rapid change. For example, consider the Constitution.



Graph 1

The Constitution was written at the beginning of the Industrial Revolution, a time when it took at least six weeks for news to travel from the U.S. to England. Today, that communication occurs in a second, 3.7 million times faster. Yet we're still operating under the same basic governance systems today as we did then, when technologies were far closer to those of Jesus's time than to today's. Hence we get situations like the financial meltdown or the Gulf oil spill, where technology-driven industries evolve far more rapidly than regulators can keep up.

Why is this so? Because until the Technologic Age began, there was a reasonably close sync between how rapidly each of the three major types of systems were evolving: ecology, technology, and beliefs (which shape how govern ourselves). Today, the bonds between that trinity have fractured, creating a growing disconnect between human belief systems and the realities of contemporary life.

Because of this breakdown, it's fair to ask whether we have the intellectual or institutional ability to adequately address the issues created by the rapid growth of technology. Arguably, this is a far more difficult and important question than that of sustainability – while technology can address the waste it creates, it can't do much to improve our institutions or judgement.

Which leads into the third challenge: How will your generation deal with these disconnects? The choice you have is the same one humans have always had: act on beliefs, or act on facts. As our knowledge base has grown, a fact-based approach has become more important. However, because there's a basic human need for belief systems, belief is still humanity's predominant way of interpreting the world.

Here, too, your generation will face much greater challenges than those facing your forebears. To understand why, let's once again go back to your great-grandparents.

Grossly oversimplifying things, your great-grandfathers were on the leading edge of the so-called "Greatest Generation," those men who saw evil in the world and vanquished it. But that generation's moral compass was essentially the same as that embraced by the nation's founders, people who created a system which denied basic rights to women and counted blacks as 3/5 of a person.

Such moral standards may be discredited today, but they shaped the environment in which your grandfathers were raised. Things began to change, however, with the post-World War 2 explosion in knowledge. As people learned more about how the world actually worked, it became increasingly difficult for thoughtful people to accept such long-held beliefs as the superiority of a particular race or gender.

This "starting to question things" environment took hold just as your grandfathers started their careers and families. It's also the environment that set the stage for the 1960s.

The true significance of the 1960s is not the hippies or protests or the like. Instead, it's the fact that the 1960s marked the beginning of America's effort to reconcile its existing belief systems with the facts that contradicted them. That effort continues today.

Being bright people, your grandparents began to wonder about things people had long taken for granted, and that questioning changed their world view some. Not entirely, but some. Skip ahead a generation and, because knowledge was increasing geometrically, it was even harder for my generation to blindly accept beliefs that flew in the face of fact. With your generation, the balance will tip even further.

The generational divide on gay marriage is a perfect example of this phenomenon. Granddad's generation tends to be against it, for it cuts against the cultural norms they were raised with. In contrast, your generation doesn't think twice about gay marriage, because time has shown that sexual preference doesn't matter all that much. Similarly, your generation differs from Granddad's by taking in stride the concept of constantly-changing careers, but rejecting that damaging the planet is necessary for economic growth.

Each of these shifts represents a big change, yet each took place in just a couple of generations. Add several such changes together, and you begin to understand why current affairs are so impassioned and chaotic.

You also get a glimpse of your future, for as more and more beliefs are called into question, the passions and chaos will only escalate. In particular, as the gulf widens between the pace of technologic change and biologic ability to adapt, there will be a very-human tendency not just to revert to traditional belief systems, but to embrace such beliefs even harder. Witness the Tea Party, or the growth of fundamentalism in all major religions. The result will be increasing tensions between the faith-based and fact-based worlds, for each will see the other as an existential threat.

But reality is different, for belief and fact are opposite sides of the same coin: belief systems are as central to being human as is the desire to learn and apply that knowledge. Given that reality, the big-picture challenge facing your generation will be to create human systems – belief, governance, and economic – which recognize the importance of belief while simultaneously accommodating new facts and increasingly-rapid change. I wish I knew what such a system looked like; unfortunately, all I can do is envision its general contours.

So what does all this mean for you? Two things, both resulting from the world's increasing levels of uncertainty.

First, yours will be a pioneering generation, trying to figure out a new way to order a world marked by increasing amounts of knowledge, increasingly rapid change, and an increasing urgency to live more gently on the land. Because the growth of knowledge will increasingly cast doubts on long-held beliefs, you'll find yourself living in a period marked by volatility and angst. However, it will also be a time of great excitement and opportunity, and I hope that is how you come to see your time on earth.

The other thing an uncertain world means for you is that there is no clear path to success, at least not as success has been traditionally defined.

What struck me most about seeing you at graduation was what a remarkable and wonderful man you've become: kind, conscientious, accomplished, and comfortable with who you are and where you're going. All of this has been noticed and admired by your friends and instructors.

More than that, though, in art you've found not only a calling, but a worthy outlet for your prodigious abilities. You might have a more certain future were you to pursue medicine or law or something like that, but in an increasingly uncertain world, who's to say what "certain" is? More to the point, in art you have both a passion and a timeless skill, something as relevant today and tomorrow as it was thousands of years ago. As you hone your talent, you'll be as well-positioned as anyone in your generation can be in this uncertain world. If you keep nurturing these qualities, along with your essential humanity and desire to give back, the world will indeed be a better place for you having been part of it.

I couldn't be more proud of you.

All my love.

Dad