

Somewhere Between Panic and “What, Me Worry?” (Cutting your anxiety in half)

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For The Chalice and PR:

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Part of our brain is hard-wired toward anxiety including fear of the future. And we know anxiety can seriously compromise health, happiness, and our ability to get things done. Another part of our brain has evolved to counter this anxiety. Let's feed that part some good news!

Bulletin quotes:

“Man is not worried by real problems so much as by his imagined anxieties about real problems” — Epictetus

“...anxious people can have a hard time staying motivated, period, because their intense focus on worries distracts them from their goals.” — Winifred Gallagher, *Rapt: Attention and the Focused Life*

Reading:

Following are the words of Peter Diamandis, originator of the X prize prompting a variety of innovations including successful private space flights with a 5 day turnaround.

Since the dawn of humanity, a privileged few have lived in stark contrast to the hardscrabble majority. Centuries of conventional wisdom has always said this gap cannot be closed. But it is closing – fast.

A kid in Africa with a smart phone is walking around with a trillion dollars of computation capabilities by 1970's standards. That kid is now a part of the interconnected worldwide brain, the largest and most innovative brain ever seen.

Why should we care? In today's hyperlinked world, solving problems anywhere, solves problems everywhere. Raise global standards of living, the studies show the less violence and civil unrest. As quality of life increases, birth rates decrease. Moreover, the greatest tool we have for tackling challenges is the innovative human mind. Three billion new people have relatively recently plugged into that worldwide innovative brain. If you are amazed at the progress in this last decade, hang on. You ain't seen nothin' yet.

Main Talk:

I want to share with you the good news this morning!! Hosanna!!

No, you aren't in the wrong place and it's not Easter Sunday. It's just that we UU's have such anxieties about so much that goes on in this world that some good news now and again is appropriate. Our first UUFR President, Andy Kelsey, used to tell the story of his first venture into a UU church which happened to be All Souls Unitarian Universalist in D.C. The sermon was one of attempting to raise the anxieties of one of those awful things going on and, at the close of the service, the leader said "OK, the buses are out front, let's all go and demonstrate against..." Andy wasn't about to be so controlled. He walked out and never went back. Andy

joined the UU Church of the Larger Fellowship, our mail-order branch which has not buses, until UUFR came along.

While awareness is certainly good, going beyond that to raising anxieties with dire predictions is a powerful control tool. Organizations raise anxieties to support their agenda. Governments raise their citizens' anxieties telling them only government can save them from some gloomy future or another. And being safely in our church here this morning, it is hard not to be aware of other theologies in our community that use heaven, hell, and God to raise anxieties and gain the ongoing emotional control over and support of their membership. This morning I hope to reduce some of your anxieties with some good news and risk that your attendance here isn't because you've been scared into showing up every Sunday.

The relieving of those very personal anxieties you may have regarding your family, health, and other things only you know about we try to do here through other means. I will concentrate this morning on more worldly issues freeing you to better focus on the personal.

I'll quote some old predictions that were anxiety raisers. No crackpots. All are from those judged by the media and their peers as credible sources: My guess is some of you will think—"oh yeah, I remember that one."

"Civilization will end within 15 or 30 years unless immediate action is taken against problems facing mankind." Now that's a show stopper, isn't it? "Population will outstrip small increases in food supplies...By 1975 widespread famines will begin in India, spread by 1990 to include all

of India, Pakistan, China and the Near East, Africa. By the year 2000 all of South and Central America will exist under famine conditions. With the exception of Western Europe, North America, and Australia, the whole world will be in famine.” You remember Paul Ehrlich, Stanford University biologist? “Scientists have solid evidence (that, by 1980) urban dwellers will have to wear gas masks to survive air pollution and air pollution will have cut the sunlight by one half...light will be filtered out of the atmosphere and none of our land will be usable.” “By 2000, ... there won’t be any more oil.” “In 25 years (about 25 years ago), somewhere between 75 and 80 percent of all the species of currently living animals will be extinct.” “Be prepared as in another decade, or at the most, two (which would now be a couple decades ago) there will be no more songbirds.” “Within a few years, infectious diseases will be mutating so fast that a global pandemic reducing the world’s population by half is unavoidable.” “Sea levels will rise 20 feet by the end of this century inundating all coastal cities and obliterating island countries. And fresh water will be like gold.”

Some of these people are still at it today.

Why is this anxiety raising important to us? Because our stress-prone bodies are hard wired by evolution to respond to messages of fear and threat. Unless we are conditioned to realistically assess such purported threats, the amygdala kicks in and is almost impossible to turn off, compromising our health and productivity. Author Peter Diamondis summarizes, “We are feeding this amygdala fiend. Pick up the Washington Post and compare the number of positive to negative stories and, by his count, typically 90% are negative. Bad news sells because the amygdala is always looking for something to fear. The good news is that positive aspects of

thought are also hard-wired into our brains. The bad news is that these behaviors are wired into the slower-responding, more recently evolved, pre-frontal cortex.” Focused thought and a grounded perspective needs to overcome this induced anxiety to prevent it from bleeding away our productive focus.

In each of the predictions I mentioned, the productive innovators were addressing the challenges long before the predictors and their pundits voiced them and the predictors failed to account for such innovation. Predicting the specifics of technological advances isn't easy. Even our most faithful sci-fi fans have been surprised. Today, a ghetto orphan in India learns how to operate a computer with no one teaching her and within days is instantly communicating around the world in an area of her interest. The percentage of poor in the world has been recently reduced by half. U.S. energy production is rising to the point we are now exporting our excess. We carry a library in our pockets. (Show a thumb drive) We are regenerating aging body parts. Recognizing all this builds confidence by comparing the failed predictions with the tremendous gains that are our reality.

Brainpower and experience, fueled by communications and resources, feed this progress. A good idea has nowhere to go if it can't be shared with others. An envisioned solution needs resources for the originator to try it out to see if it really works. In Renaissance times, a small handful of men and even fewer women innovated and the best ideas took centuries to be implemented. Nearly all the population was busy just surviving. Today, more than 6 billion of our 7 billion are above survival mode thus broadening the capacity to innovate. Women and

men work side by side as scientists, engineers, tinkerers, and innovators doubling our brain power, on what the future might be like. A cell phone, morphing into smart phones, connects those 6 billion including some of the dirt poor. That means a motivated budding Einstein or Edison, whether in Albania or Zimbabwe, has an opportunity to reach out to feed her interests, share her ideas, and even attract funding to provide the resources to go another step. The metaphor for this connectivity is our world-wide brain. One of my winter series speakers, Dr. Juan Gonzalez, now of the University of Texas, may be an example as he escaped from the drug wars of Medellin, Columbia, to pursue his passion in geology and oceanography. Connectedness has made Juan a part of the world-wide brain.

What would one of my talks be without a few numbers? This will be so short you'll hardly have time to doze off. Google Executive Chair Eric Schmidt states that from the beginning of the popularly defined human existence 150,000 years ago until 2003 "humankind created five exabytes of information." (How many zeros in an Exabyte is not important.) He continues, "In 2010 we were generating that five exabytes every two days. And by 2013, five exabytes every two minutes." As we all know a lot of that is trash, spam, or of little consequence. Information sharing among innovators helps solve the challenges ahead. Today Einstein would not go from Switzerland to Denmark to collaborate with Niels Bohr. No longer does a budding Einstein in Ethiopia or Kazakhstan NOT be able to grow and contribute merely due to their physical isolation. That makes for truly awesome innovative capabilities world-wide.

Allow me to share some rapid fire specific good news in six areas: Water, Crops to feed and clothe the billions, Energy, Health, Education, and the Environment.

Water

Yes, the challenge has been known for decades if not a century or more. The poorest countries now spend 20% of their GDP on fresh water. So fresh water has to follow the path of aluminum which transitioned from one of the scarcest items on earth to abundance. Here's just a peak at what's going on.

Industrial recycling of water is accelerating with all sorts of industry-specific new innovation.

Serving villages, there is now a \$2500 water purifying device that produces 250 gallons per day with no more energy consumption than a hair dryer. Put the inlet hose into any source of moisture, arsenic-laden water, salt water, a latrine, and the outflow is 100% pure pharmaceutical-grade injectable water. If no electricity, it comes with a Sterling engine which burns almost anything. A six month field trial in Bangladesh running on cow dung was a resounding success with its excess electricity output providing lights and charging cell phones. The Coca-Cola network is piloting a program in Africa to help provide and maintain these units.

New family-sized manual water purifiers using nanotechnology filters now eliminate bacteria, cysts, pathogens, and even viruses.

About 1/3 of all residential water use in America goes down the toilet. 21st century toilet technology generates electricity from burning feces to flash evaporate urine and makes available what remains for fertilizer. Astrophysicist Lowell Wood previously of Livermore Labs leads this effort. His background is nuclear fusion, X-ray lasers, and what was initially called Reagan's "Star Wars," now our missile defense program.

Half the world's fresh water is wasted through leakage and inefficient usage. Computerizing systems helped Hewlett-Packard has cut Detroit's losses by 15% and applied to irrigation, cut farm usage 20%. More on the path to fresh water abundance when we get to energy.

Crops for the Nine Billion

Genetically engineered crops now planted on a half billion acres in 30 countries have increased output by 30 million tons of corn and 15 million tons of soybeans. India's cotton is 90% genetically modified for pest resistance cutting pesticide usage in that country in half and increasing honey production as a bonus. World-wide pesticide use has been reduced by a billion pounds and herbicide usage is way down as well. Less applications of both cut farm machinery fuel consumption to the equivalent of eliminating nine million cars .

Producing meat is inefficient. Innovators have developed plant-based meat substitutes that look and taste like meat with similar nutritional value. Even premier chefs have trouble telling the difference.

Soil-less growth of plants is headed toward commercialization that will allow vertical farms moving food production closer to cities. Imagine a 20 story skeleton structure fully automated through the planting, growing, and harvesting cycle that delivers just the right nutrients and moisture to each plant, no waste. Lest you think computer farming is too far-fetched, one of our Winter Texan friends is a dairy farmer. His automated system optimizes milk production by identifying each cow by an electronic chip, trains each cow to enter a milking stall by delivering a biscuit only at her personally optimized time, and milks the cow with laser-controlled locating equipment.

Recent nano-farming research has uncovered some single cell organisms that are highly efficient in converting sunlight, co2, and water to nutrients needed by humans possibly moving crop production from thousands of lbs. per acre to 100,000 lbs. per acre.

Sea farms in Mexico, the U.S., Japan, and the Mediterranean are advancing toward raising even previously far-ranging tuna with some success.

Energy

The U.S. carbon emissions are falling so fast due in part to genetically modified crops and fracking for natural gas that we are now back to the level not seen since the 1990's.

Hydrogen gas can replace our petroleum-based portable fuels if it can be produced economically. Scientists have found a combination of cadmium and selenium catalysts in water

with some other chemicals that when hit with sunlight splits water into oxygen and hydrogen gas much like photosynthesis. Hydrogen emits nothing except recoverable pure water adding to fresh water abundance.

Great leaps forward in home energy efficiency are continuing with such multi-purpose materials like peel and stick solar panels that replace shingles and the continuing spread of solar water heaters and higher efficiency appliances, lighting, and electronics.

The move toward nuclear power around the world is picking up steam (pardon the pun).

Countries that have shut down their nuclear power plants are now rethinking that decision.

Sixty-eight electric generating plants fueled by uranium are under construction, only four so far in the U.S. Readily available uranium, used in the old fashioned way, will meet our growing electrical needs for at least 500 years. With the perfection of breeder reactors, that becomes 30,000 years. Commercializing the extraction of uranium from seawater adds another 60,000 years. Combined, that's energy enough for roughly the entire span of the period that humans have been humans. Research is making gains toward a thorium reactor, more plentiful than uranium, and thorium produces less sensitive waste. Such an abundance of low-cost, pollution-free electric power is very important. Applied to seawater, we can produce (1) portable energy in the form of hydrogen for transportation needs, (2) distill an abundance of fresh water, and (3) do that for the next 100,000 years.

And if you are not yet giddy enough over a bright future of abundance, there's hagfish slime. Yes, I said hagfish slime. Newly discovered strands from hagfish slime (ugh sounding!) are totally different from anything that we've seen in the natural world, are equally as strong and light as spider silk and three times more stretchy. Stronger, lighter products typically equal more efficient operation. I suggest you don't imagine the harvesting process—wait for our scientists and innovators to synthesize it.

Health

Bridging health care and education, a youngster's brain learns extremely rapidly during what scientist call the "critical period"—neuron connections are made and others unused are abandoned. In time, the connections crystallize and the ability to easily learn languages, for instance, goes away. Plus, a child's brain can heal from problems for which the adult brain cannot. The adult brain loses that learning and relearning flexibility due in part to the change in levels of a substance called lynxl. Researchers now can re-tweak the production of nerve cell activity thus expanding our adult learning capabilities and improving the repair of brains damaged by stroke or other trauma. The first step has been demonstrated with older individuals with blurred vision. The brain sharpens the vision even though the eye to brain signal was unchanged.

We have a new ability to derive molecular architecture from DNA. Here is one example of what this ability means. The 100,000 varieties of venomous creatures produce an estimated 20 million different toxins. Only 1,000 have been analyzed so far for medicinal properties. This

has resulted in widely used treatments for hypertension discovered in Brazilian pit vipers, fibrosis control in weak hearts from the Eastern green mamba, blood sugar reduction and increased insulin production from gila monsters, anti-coagulants from vampire bats, and cancerous cell identification (and thus successful surgical removal) from the deathstalker scorpion. Five compounds from cone shell venom are now in clinical trials targeting the control of epileptic seizures, pain management, and hopefully some protection against Alzheimer's and Parkinson's. Imagine first responders having a spray to stop bleeding in an automobile accident based upon brown snake venom. It's on the way. And that's only 1000 venoms analyzed-- about 999,000 venoms yet to go.

Remember "Star Trek's 'Bones'"? Having a hand-held blood and urine analyzer that telecommunicates the result to your computer for health analysis is getting close. These are hand-held medical labs.

More than a dozen clinical trials are underway to get our bodies to regrow cartilage and tissues. A prime target is hyaline cartilage that is the slippery, glassy, elastic, and smooth gristle that caps the bone in weight-bearing joints allowing knees and hips to move about pain-free. One of the key researchers, Wan-Ju Li of the University of Wisconsin who also teaches joint replacement surgery, joked with his students "You guys are going to have to find a new job soon."

In the meantime, some of those replacement joints are being made on 3-D printers. There are many thousands of those printers now that make parts that are exact duplicates of whatever you can scan or draw. No more going somewhere to get something—just have the design sent digitally to your home 3-D printer which will make it. The cost is dropping rapidly.

Regrowth of hair cells damaged by loud noise now works in mice. Awaiting human trials.

Nanoparticles to deliver cisplatin and docetaxel right to cancerous cells will reduce side effects of chemotherapy.

Centenarians, folks who live to be 100 or more, age healthily and then just die without lingering diseases. Understanding why and what interventions will give more of us such immunity to eliminate age-related diseases like cancer, heart disease, and diabetes. This is a critical step as it is our largest burden on the health care system.

Remember that 21st century toilet? Eliminates a critical source of pollution and stops the contamination source that brings illness and death to many in the developing world.

Education

In 1999 the Indian physicist Sugata Mitra got interested in education, especially in the parts of the world without schools and where good teachers didn't want to go. Mitra was the head of R

& D for NIIT Technologies in Delhi, India with headquarters adjacent to an urban slum. Mitra cut a hole in the compound wall and securely installing an internet connected computer and track pad facing out. The kids of the slum knew nothing. They were just kids. And like all kids, curious. Within minutes they had learned to point and click. Within a day, they were surfing the internet—and even more importantly—teaching each other how to do the same. He reran the test in a more remote slum and got the same results. In a rural village, same result. He had found that youngsters, working in small, unsupervised groups, and without formal training, could learn to use computers very quickly and with a great degree of proficiency.

Next he set up a computer among 12-year-olds to see if they could teach themselves biotechnology. He says, “All I did was tell them that there was some very difficult information on this computer, they probably wouldn’t understand any of it, and I’ll be back to test them on it in a few months.” After 2 months, they scored an average of 30%. He ran the test again with one slightly older girl providing only encouragement. A 50% understanding level resulted, equivalent to India’s best high schools. Mitra is now expanding through the resources of the University of Newcastle in England.

Nicholas Negroponte of MIT’s one laptop per child program in Cambodia has cut truancy from 30% to zero and greatly accelerated learning. Other countries are moving in this direction.

There’s mastery –based learning moving forward with Salman Kahn that sponsor Bill Gates believes “gives an observer a glimpse of the future of education.” Also the Apangea Learning

math tutor that has increased passing rates of at risk students from 20 to 90 %. These are individually responsive, reward-based, artificial intelligence programs that are part of the process of sorting out what works best for each individual student using teaching innovations that have only recently become available. Some new systems will fall by the wayside but some seem to working remarkably well and will spread.

What is working? Google and a calculator is replacing a head full of ready facts and the multiplication tables we likely each learned as children. That's hard to accept for many of us, but the future is in teaching how to be productive, new ideas, innovating, thinking outside the box. Markets, environments, capabilities are changing too fast for that old head full of facts. And the new education systems developing are effective, scalable, and wildly entertaining making learning addictive. It's been recommended to me to play the children's game, "Pajama Sam," to really get this message. That I have not done as yet, but the "Myst" game series certainly advances your adult thinking and problem solving skills.

Imagine the future innovative power built on this foundation of improved world-wide education.

Environment

Much of the stress on the environment is tied to the increasing human population. That increase has reversed among the developed nations at the same time those nations have

become wealthy enough to take steps to protect and improve the environment. Both will happen in currently developing nations as they catch up. The spread of technology can be considered a prophylactic to further protect the environment.

Reconstructing the genomes of extinct species to repopulate is becoming a reality.

Confidence that species can adjust to climate changes is increasing. For example, new genetic analysis techniques have uncovered that the polar bear species is 600,000 to 4 million years old instead of a mere 150,000 years old as previously thought. This is critically important to know that their genetics have the flexibility to survive warm spells, even the exceptional warm spell that occurred 400,000 years ago. We can now help in that transition.

Why is this explosion of the possibilities happening? It is the confluence of communication and resources multiplying the power of the three most important contributors to this ongoing progress; the productive researchers, the techno-philanthropists, and the do-it-yourself inventors. Following are some examples to further build your confidence in the future and reduce your anxiety perpetrated by the “sky is falling” predictors:

Productive Researchers like Drew Endy, MIT biologist, and his corporate sponsors moved to accelerate innovation in genetic engineering by encouraging college kids from Michigan to Munich to descend on MIT to show off their bio-hacking skills for the Annual International Genetically Engineered Machine competition. These pioneers of synthetic biology have put

bacteria to all sorts of productive uses. Some sniff out and destroy contaminants, others signal meat going bad by a color-change label, still others produce drugs right inside your body per your individual dosage schedule, and others provide emergency lighting for exit signs during power failures. These innovations are now in use or in the pipeline for the near future.

Another confidence builder is the continuing passion of techno-philanthropists. Following the path of so many of the past top 2 percenters like Carnegie, Ford, Mellon, Morgan, Rockefeller, Rosenwald, and Sloan, our newest technology stars are dedicating their wealth to improve the lives of others. These are technically capable and business savvy individuals and their teams with proven track records who are better equipped than the government to use their good judgment to select and fund the most promising and most productive efforts with the highest potential for success. In some cases, they or their team, help guide the direction to solutions. Biz Stone, Twitter co-founder, is pursuing meat substitutes. Howard Schultz of Starbucks is working on the water supply problem. Dean Kamen of Segway fame has taken on safe water production. The 21st century toilets, personalized education through computers, and many others are projects of Bill and Melinda Gates with Warren Buffet. That's Warren Buffet of Omaha, not Eve's Warren Buffet of Heathsville.

The networking of the third confidence builder, do-it-yourself innovators, was kicked off by the "Whole Earth Catalog" first published in 1968 (I still have my copy). The Catalog inspired the acceleration of sharing of ideas and resources within this group. Today, Burt Rutan is only one example. Rutan labeled our current space program as hugely expensive, dangerous, and, in his

words, “pathetic” in being able to fly only once every two months.” He backed up his words with action with SpaceShipOne flying twice in five days. Some thought only the government could do such things. Burt changed that paradigm, a necessary step to free the world of innovators and their sponsors to act to improve our lives and solve the challenges before us. And that is happening in many of the areas I mentioned. Elon Musk’s SpaceX, rather than a government run operation, is now delivering supplies to the International Space Station at a miniscule fraction of the cost. Chris Anderson is doing the similar thing for unmanned air vehicles with \$300 drones with 90% of the capability of the military’s \$250,000 Raven. Burt Rutan invested only \$25 million and five years in his space program. Anderson’s team succeeded with volunteer labor, a few toys, and a couple hundred dollars of spare parts. The Do-it-yourselfer’s open-source design activity team effort is accelerating to address the challenge of meeting society’s needs and moving us toward abundance.

I hope I have excited you a bit about the future and accomplished two specific things. First, a confidence that the human situation will continue to improve due to, if nothing more, this connected world-wide brain of a huge number of people that are making things better and better, albeit in fits and starts. And, second, and equally important, that you have been inoculated against the doom and gloomers that try to tweak your amygdala, raising your anxiety to take emotional control of your actions. Hopefully both will free you and encourage you to also join in doing many good things, big and small, to change our future for the better.

Closing Words from Allan Rufus: Life is like a sandwich! Birth as one slice, and death as the other. What you put in-between the slices is up to you.