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RESPONSIVE READING

(Congregation please speak the words in *italics*)

In the wide world of the human condition, there is harmony and there is dissonance.

We feel truth in harmony, happiness in the resolution of dissonance.

In the wide world of the human condition, there are problems aplenty, dissonant notes in the music of life.

We listen to the dissonant notes.

We listen with science. We listen with engineering. We join in. We compose the future as it happens, like musical improvisation.

We read. We learn. We talk. We write. We debate. We vote. We participate.

In doing so, we choose the next notes of our global song. And when we have done that, we listen, again. We wait for harmony to emerge.

In science we feel truth in harmony, happiness in the resolution of dissonance.

But the song of our species is dark and sad these days. And loud! Terribly loud! 7 billion decibels! It is easy to hear it. Indeed, you can't escape the din. It is hard listening. The dissonance is so great we are not sure it is even a song. Is it still music if there is no possible resolution? Can we find the next chord if there is no discernible chord progression?

In music we feel truth in harmony, happiness in the resolution of dissonance.

In music we feel sadness in dissonance. We feel agony as the dissonance grows. But still we keep playing. We are tempted to stop, to shut our ears against the noise. But we keep playing. We play through the pain, and harmony emerges, and with it, happiness.

If we keep listening and playing the music, we resolve the dissonance, we find harmony, and we feel great joy.

Musical Truth and the Impossible Sadness of the Human Condition

Good morning.

Some topics defy words. For those topics we turn to the arts.

To present today's topic I want to play for you the Prelude in E-flat major from the 4th Cello Suite of Johann Sebastian Bach. I should tell you this is a strange piece of

music. It was probably originally for organ because you need two hands and two feet to handle all of the voices at once.

I first played this piece in public when I was 18. The piece was beyond me then, but I didn't know it... I was going off to college and I wanted to show off. (Other 18 year old boys would show off by bench-pressing 180 lbs or slam-dunking the basketball. I played Bach.) So I started playing it...

[first 2 bars of Bach's E-flat prelude]

But somewhere half way through the piece, I lost the sense of it, and I wandered through the space of its complex chord progressions with bumpy intonation...

[middle section of Bach's E-flat prelude]

When I returned to E-flat major at the end of the piece, it seemed off somehow. It seemed like I had ended in the wrong key.

They clapped anyway. But it took the next player in the recital to erase the dissonant aftertaste.

So I made a career in science, but I never quit playing Bach. In fact whenever I run into a seemingly impossible conundrum in the lab, I meditate on Bach. For example, this last week a student in my lab was stuck with a scientific contradiction that neither of us could solve. So I told her, "Wait just a minute. I have to meditate on a Bach fugue."

[2nd mov't of 1st vln sonata. 3 bars.]

The interweaving fugal counterpoint traveled in different directions, riffing at cross-purposes, notes fighting each other for attention, both melody lines wanting to define their own tonality... But then again, they both followed a common bass line.

"Aha!" I said. "I know the solution to your problem!" I said. And I told her what the two contradicting experiments had in common that tied them together. She knew what to do next. Problem solved.

In the end, all of those seemingly unresolvable dissonances of science can be resolved, eventually, if you just pay attention to all the notes.

That's the point I wish to explore with you.

Is problem solving in science like resolving dissonance in music?

If problem solving in science, or social science, or political science, is like finding the notes that reconcile, finding the chords that bridge melodies, finding the underlying beat that ties it all together. If life is like one big long medley, then whenever things are going wrong, whenever dissonance and discord rule the day, then the way to resolve the dissonance is to *listen*, listen to *all* the notes.

Let's do some critical listening, starting from easy dissonance and going to increasingly hard dissonance, and let's see what the brain does with it. Here's some very easy dissonance.

[C major, G major, C major]

I set the tonality. I step away from the tonality. I step back to the tonality. Easy? Yes. Interesting? No.

Let's try a harder dissonance.

[8 bars of C-major sarabande, from cello suite #3]

I set the tonality. I step away from the tonality. I step further away. I turn a tonality corner, and look around. I come full circle. Ah. It feels good to be back. Solving a moderately hard dissonance feels good, like solving a moderately hard problem.

Now let's try an even harder dissonance.

[Ravel's Bolero, repeated minor 9th chord sequence]

What was that? It didn't resolve. It was incomplete. The tonality was never set. It left us with a dissonant aftertaste.

We may wish we had never heard it.

I didn't resolve it. Instead, I stopped playing.

In science, or social science, or political science, some problems are so hard, you can't resolve them to save your life. Most of us avoid these problems. We choose not to hear them. We shut them out. If we know we can't solve the problem, we simply don't try, because we know we will be left with a dissonant aftertaste.

And that's fine. You can leave a problem unresolved if you don't actually need to solve the problem to save your life. But what if you do need to solve the problem to save your life?

At this point I have to tell you, sadly, that my life is in danger.

I have known it for many years now, and I spend most of my waking hours trying to figure out a way to survive.

Not *only* is my life in danger. *Your life* is in danger, too. Everyone's life is in danger. Every human on this planet. In fact the human species itself is in danger. In danger of extinction sometime in the next century or so. And many other species are in danger, too. Only the lowest life forms are safe. The bacteria, the protists. And the plants. The plants are safe. And the cockroaches.

The danger I speak of, the impossible sadness of the human condition, is the seemingly irresolvable dissonance of human overpopulation.

Most of you know what I'm talking about and some may be fighting the urge to tune it out as it triggers a dissonant aftertaste. But let me go forward with this. Let me be perfectly clear as to why I think it is life-threatening, even civilization-threatening.

First the math. The problem is that populations grow exponentially until they reach a limit. That is, they grow by doubling. That means they grow ever faster. That's not a surprise. Exponential growth is the natural way of living things. If you've ever seen bean dip go bad you know what I'm talking about. But now it's us. We're doubling. The global human population reached 1 billion in 1802. In 1927 it reached 2 billion, a doubling time of 125 years. 3 billion was reached in 1961, 4 billion in 1974, 5 billion in 1986, 6 billion

in 1999 and 7 billion in 2011, a doubling time of about 45 years. Not only are we still doubling, we are doubling faster.

Practically no one believes we can double again. The total food resources required by 7 billion people amounts to well over half of the maximum total world capacity for food production. And that capacity is itself decreasing with time.

Commercial fish stocks in the world's oceans have decreased by over 90% over the last fifty years. All of the world's commercial fisheries are projected to be economically unsustainable by 2045. [Richard Ellis, *The Empty Ocean*] This includes farmed fish, because to feed a fish farm you need five pounds of wild-caught fish for every pound of farm-raised fish.

On land, only 1/32 of the Earth's surface is suitable for growing food, and nearly 100% of that land is already farmed. In the US we are losing a million acres of good farm land every year. More than 75% of the nation's fruit, vegetable and dairy products are produced on urban-edge farms that are threatened by sprawling development. [American Farmland Trust]

Not to mention the limits to waste production. We are putting carbon into the atmosphere at well beyond the rate that it can be assimilated by plants, and that carbon is warming the Earth, and global warming will have unknown effects on food production, probably negative. Rice flowers are not pollinated if nighttime temperatures do not fall below 80 deg F. Alas, rice provides more than 1/5th of the world's caloric intake. Climate change will make some areas too dry and other areas too wet for efficient cultivation.

It looks bleak. It looks like we have less than 45 years to live.

But let's not assume that. Let's look carefully at how things could play out. How bad could it be?

Well, on the one hand, we could just stick our collective head in the sand and go about our reproductive business as usual. Then we would grow and grow, until.... well, until what?

For this topic we turn to music.

Turn of the century French composer Maurice Ravel once experimented with writing a symphonic work that only increased in volume, never decreased. He started the piece very quietly with a soft snare drum and a clarinet, *like a small band of hunter gathers migrating out of Africa*.

[opening tune from Ravel's Bolero]



The balloon representing our over-extended resources will shrink instead of popping. And if the balloon gets punctured by anarchy and terrorism, it will be an isolated puncture and will not spread across the globe, because our resources will not be over-extended and we will have something in reserve when the supply lines break down.

We will do this by listening. By listening to the *impossible sadness of the human condition*, we will hear that it is not so sad after all, and not so impossible. There is in fact a solution. It is an easy one and it is a peaceful one. There are many people who are listening to this sad tune, and they see the solution, are out there trying to get our attention, but they are still small like a voice in the wilderness.

They are saying "stop population growth." They are saying if you increase the number of people on the planet, you increase the root causes of suffering and unrest.

They are the Population Media Center, and Global Population Speak Out. They are David Suzuki and Richard Attenborough. They are Elisabeth McCollough, who made the film "Mother, Caring for 7 Billion", which I have shown here and will gladly lend out to anyone who will watch.

The peaceful solution to overpopulation, *they who know* say, is (1) the **empowerment of women** and (2) **adequate healthcare for all children**.

No, war is not the answer. A global epidemic is not the answer. Starvation is certainly not a good solution. This is not just some feel-good message tuned to the sensitivities of Unitarian Universalists. This is the conclusion of the experts, the visionaries and the wise. This is the way that has been tested in the field. The empowerment of women and better healthcare for children.

The empowerment of women worldwide means putting family size decisions where they belong, with the mother, not with the father (whose motivations may be colored by competition or ideology) and not with governments and churches whose cultural practices may not be adapted to the times.

Men, governments and oppressive religions must step aside.

If we do this, the global birth rate will drop.

Currently, roughly 38% of all pregnancies worldwide are unplanned or unwanted. Eliminating this 38% would immediately stop population growth. In addition, we know that unwanted children are at greater risk of low birth weight, at greater risk of being abused, and are more likely to not receive sufficient resources for healthy development. Most, if not all, unplanned pregnancies could be prevented by easy, safe and effective contraception, and by the concomitant education of young women. Contraceptive technologies are good, but they can improve, they can be made cheaper, and women must be empowered to take advantage of these technologies.

Improving the health of children is also critical to stop population growth, because mothers whose children are healthy *choose* to have fewer children. Recent improvements in child health have contributed to a decrease in family size in every country in sub-saharan Africa except Nigeria and Chad. Most of these countries now maintain a low 2.6 children per mother average. Rwanda's fertility declined an amazing 25% between 2005

and 2010. But in Nigeria, 40 percent cite religious beliefs as the main reason for non-use of family planning. While in Chad, women still cite an ideal family size of nine children, and only 49 percent of married women have contraceptive knowledge. So these are the challenges.

Let's face the facts. The population growth must end, and there are only two ways for this to happen. Either the birth rate *decreases* or the death rate *increases*. No one is proposing the latter.

The global population is currently growing at its fastest rate ever, 1 billion new people every 12 years. But the signs are promising that it is turning around.

Eastern Europe, Japan and many regions in China are already shrinking in population.

In the US, the non-immigrant white population went down for the first time in history this year.

Women are becoming empowered throughout the world, led by incumbent female heads of state in 15 countries, including Switzerland, Brazil, Argentina, Liberia, South Korea, and Australia.

And even in Texas, a very restrictive new Abortion law was temporarily stopped by a filibuster carried out by courageous Texas state senator Wendy Davis and a crowd of "loud, unruly protesters."

The key to addressing the largest of all dissonances is to stay loud and unruly, to keep bringing it up, and not to stop talking about it until the dissonant aftertaste is resolved and the threat of a crash is averted. If you are wondering why you should talk about such an unpleasant subject as global population, just remember these three reasons.

1. Because overpopulation is the root cause of starvation, war and injustice.
2. Because no problem is ever solved by not talking about it.
3. Because resolving the greatest problem of our time will bring the greatest happiness.

So now, to help you engage with dissonance, I will play the prelude in E-flat major by Johann Sebastian Bach.

[cello suite #4, 1st mov't]

Concluding words

There is no God in the sky. God is in the heart that loves the sky's blueness... It is not the supernatural that is spiritual. The supernatural is a flight from the spiritual—a flight into something projected as material -a thing of childish imagery... If we are to be equal to the times we live in—and to the greater problems the future will bring—we must outgrow our childishness. We cannot afford to trust the unreal, to exchange the courage of struggle for the cowardice of begging for miracles.

(A. Powell Davies, 1902 – 1957)

