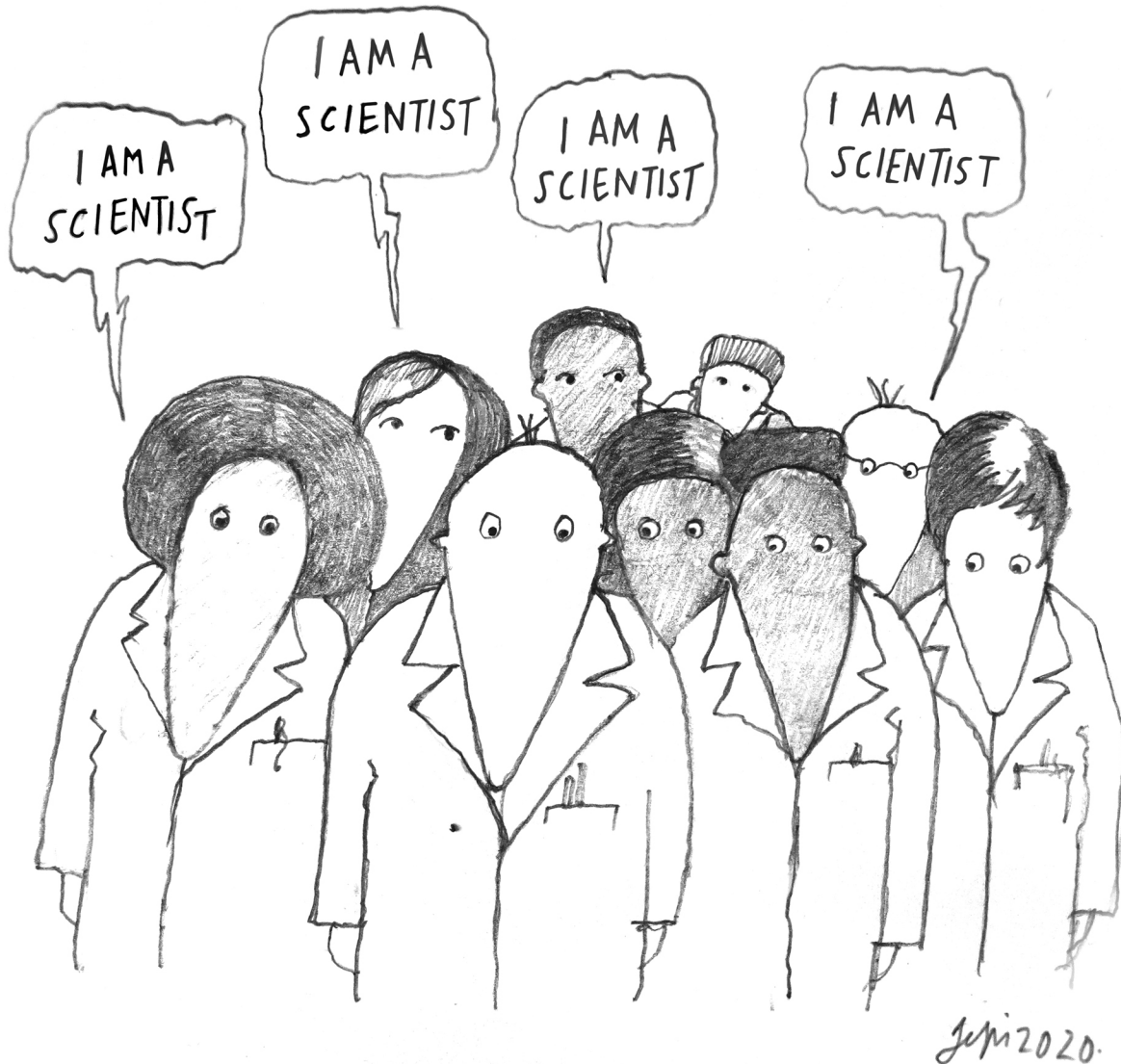


STICKY WICKET

Corona XII – punctuated equilibrium

Mole

Original artwork by Pete Jeffs - www.peterjeffsart.com

It starts when you're always afraid. Step out of line, the man comes, he's gonna shoot you down. It's time to stop, children, what's that sound? Everybody look what's going down.

Some of you are thinking, those aren't the words (they *are* the words in a live recording). Some of you are thinking, what are you talking about? And some of you might be thinking, "This is not my beautiful house." (Sorry, wrong song). The above is from the song "For What It's Worth," written by Stephen Stills and performed by Buffalo Springfield. It was released in 1966. We sing it today. There's something happening here.

Rayshard Brooks, George Floyd, Breonna Taylor, Ahmaud Arbery, Philando Castile, Tamir Rice, and on and on and on. Our

society is finally coming face to face with the deeply pervasive racism that saturates our lives. Not only in the killing of unarmed people for the crime of having dark skin, not only in the statues erected to slave owners and generals who fought for the 'right' to own people, not only in Confederate flags waved at car races. Not only in cross burnings, lynchings, hate crimes and people shouting "Blood and soil." But everywhere. And yes, even in this thing we do, this biomedical research thing. Racism, sexism, homophobia, transphobia, islamophobia, anti-Semitism, xenophobia. If we don't see it, we have to look harder. Scratch and sniff.

In my country, the one shepherded by a self-described nationalist, a racist, sexist, xenophobe who cannot tell the difference between

reality and reality TV, we seem to be undergoing a phase transition that is enveloping the world. We seem to be asking, “What can I do to fix this state of things, all of this -ism and -phobia?” And we are being told, “This is *your* problem, not *my* responsibility to tell you how to correct it.” But look harder; we are infused with biases and first impressions, assumptions and judgements. We evolved to judge quickly and respond; it makes sense if you are a cave dweller needing partners but wary of strangers. But it is long past time to evolve some more. I hope we can.

Stephen Jay Gould was a wonderful evolutionary biologist and paleontologist, who was also a scholar of the history of science. If you don't know him, you should look up his books. Some of these are collections of beautiful essays he wrote for the magazine *Natural History* (when we actually read magazines) and some are eloquent treatises on single topics. In one, *The Mismeasure of Man*, he provides a history and critique of statistical methods, and approaches to biological determinism, the idea that disparities in race, class, and sex have a biological underpinning. He doesn't just critique this idea, he tears it to pieces.

But it continues today, this concept of biological determinism. In my country, where we worry about a second wave before we have managed our ongoing escalating first wave, this Terrible Pandemic has taken an especially hard toll on the lives of people of black or brown skin. And so many of us asserted, without evidence, that this must be genetic. Well, the numbers are in: this effect is socio-economic, not genetic, the result of our -isms that have compromised a large segment of our population. When outcome of SARS-CoV2 infection was evaluated in African-Americans, the overwhelming determining factor was income; affluent individuals could not be discriminated on the basis of race. Genetics is almost certainly a major factor (probably the main factor) in determining outcome in young individuals – but this does not correspond to race. We have to face this, systemic racism is killing people. We will not solve this problem with a few new laws about choke holds (but yes, we do need these, too).

Probably Stephen Gould's greatest contribution of our understanding of evolutionary biology was the discovery of punctuated equilibrium, a finding that challenged our Darwinian idea (espoused for example, by Richard Dawkins in his *The Blind Watchmaker*) that evolution is an extremely slow process that requires “deep time.” Gould found evidence in a rich fossil record of mollusks that long periods of “sameness” (equilibrium) were punctuated with short periods of rapid change. As a historian, he found echoes of this concept throughout the literature on evolutionary biology, including in Darwin's own writings. He even applied the concept to inventions, for example, in the “evolution” of kerosene lamps.

I hope that we are in a process of punctuated equilibrium now, with regard to our -isms and -phobias. We cannot wait for

generations for this evolution (although, yes, it may well take generations). We have to face this now – in ourselves – and begin the process. My most sincere hope is that we might be seeing a beginning. That's all it is, but we have to begin somewhere.

It is easy, I know, to say such things, and we need action, not words. We have had words for ages now. We are getting a lot more. There are hints of some action, yes, and action takes time. People are angry, and should be, and that anger, that righteous outrage, is palpable. It is easy to direct that anger at institutions but, really, our anger has to effect change, and that change has to come not only from our institutions but from ourselves. I know these are only words – but words are all I have here. We are taking it to the streets, we are taking it to the parks and communities (safely, please, there is still a TP out there), but we have to take it into our homes. And our labs, our conferences, our seminars, our work.

I am an insectivore, as you know. I am also a privileged white man, who grew up in rural America and did not understand that privilege, and still don't (but I'm getting there). I am also a woman who takes pride and care in my appearance, and am, therefore, regularly disregarded by other scientists of all genders. I am an African-American man from a single parent household who has fought and fights every day to be recognized for my scientific contributions, and reach out to my largely Hispanic community to encourage kids to follow their dreams, while teaching them about the hurdles they will face (and, unlike my white colleagues, I feel pressure to dress a certain way). I am Asian and trans, and do not bring my identity, myself, to my lab. I am a brown-skinned Caribbean woman who is doggedly facing down assumptions about my abilities, based on my accent and appearance. I am a married gay man, I am an unmarried lesbian, I identify as queer, and I closet myself at meetings until I know you better (and usually even then). I am from Nanjing, working in a mostly white factory town in the American mid-west, who will be judged by my science, not my ethnicity. I am a devout Muslim who must seek out unused seminar rooms to pray. I am a new mother, who has to ask for a private place to pump between experiments. I am a new father, who begs for paternity leave but is told that my promotion may be compromised. I am a Latina from Chihuahua, who worries about my visa. I am an Iranian physiologist, who must ask other colleagues to irradiate my samples. I am a white man from Germany, an Italian woman from Milan, working in Beijing, or Tokyo, or Delhi and face open stares and questions about my reasons for being here. I am just like you, and very different, in ways you do not, and probably cannot, understand. I am a scientist. I am a scientist. I am a scientist. Say it with me. Please.

I am a scientist.

It's a beginning. There's something happening here.