

Jess' Ways of Working

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01 Oct 2021

1 My Ways

First let me address the fact that *I do not work at all* since retiring from the UBC Department of Physics & Astronomy in 2011. I just exhaust myself pursuing hobbies and/or obsessing over issues that I consider important, like politics, science and education. Of course, the case could be made that this equally well describes what I used to do *before* I retired, with the possible exception of marking exams and letting people know that they didn't measure up to UBC's standards. But let's not go there.

You may expect that, as an experimental physicist, I live by the Scientific Method. You would be correct, but you might find that my version of the Scientific Method differs from the version you were taught in high school:

1. Make an Observation.
2. Form a Hypothesis to explain the Observation.
3. Use the Hypothesis to make a Prediction.
4. Test the Prediction.

5. If the Prediction is borne out, return to (3). If not, return to (2).

Many people imagine that if the Prediction is borne out, the Hypothesis is "proven" and you can relax. **No** actual scientist believes that! Unfortunately, many *nominal* scientists allow their human "confirmation bias" to influence them and make exactly that mistake. Hopefully not me, usually.

Meanwhile, there's more variety in the Scientific Method than this simple description covers. For instance, in Elementary Particle Physics (a.k.a. Subatomic Physics or "SAP") step (1) is usually encountered as part of step (4) in a previous "round"; then steps (2) & (3) are developed over a period of years or decades by one or more (often *many*) *Theorists*, a.k.a. "Theoreticians", whose job is exclusively to think, calculate and come up with Hypotheses worth Testing; then step (4) may take billions of dollars and decades of effort by hundreds of Experimentalists organized into an army of specialists by a Group Leader who will get the Nobel for the army's work, along with the head Theorist who thought up the Prediction.

As you might deduce from my description, I don't care for this particular Way of Working, even though I acknowledge its importance and am duly awed by it. It is truly astonishing how effective such an army of specialists can become and what stupendous

accomplishments they can achieve.

But I kind of like the version where step (1) consists of, “Huh, that’s weird. I wonder what’s going on there,” step (2) springs unbidden from my Imagination and step (3) follows without excessive effort. Step (4) ideally follows immediately with minimal effort, but I’m often willing to write proposals, defend the experiment, gather resources, build apparatus, sit shifts and analyze data if that’s the only way to get the Test done. But my time limit is about a year, and I usually need some collaborator(s) to get it done.

Meanwhile I can make lots of other Observations, come up with lots of Hypotheses and Predictions, and have a ball while I’m waiting for the next step (4). In this way I can do lots and lots of experiments in one lifetime, whereas the SAPs often spend their whole career on one big Test. I’ll never win a Nobel, but those things ruin people’s lives anyway!

This Way of Work allows my Imagination to have a lot of Fun, and I suspect it feels very much like an Artist’s Way of Work.

I don’t... much less the Q-anon “autodidacts” who have raised ignorant arrogance to an art form, an *invisible force* driving the collapse of democracy, the propagation of a pandemic and the onrushing destruction of the Climate Crisis.

2 Invisible Forces

“In most of the operations of the mind, each American appeals only to the individual effort of his own understanding.”

– Alexis de Tocqueville, 1835.

IMNERHO [my favorite acronym, which is starting to scare me] this arrogant intellectual self-reliance is a wellspring of originality and genius; it describes my idol Richard Feynman almost perfectly, except for one little, absolutely necessary, addition: *genuine brilliance* – which Feynman had and