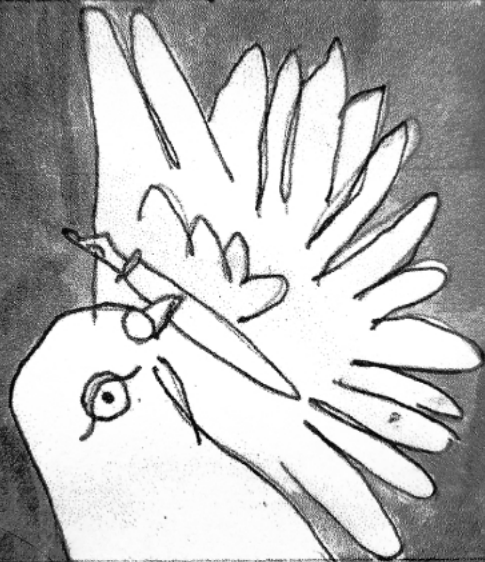


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When I told a friend about Galileo's proof against Aristotelian gravity (heavy things fall faster), he contended that physicists keep simplifying things to no end, and the whole disagreement (and a lot of others) is about people disagreeing about spherical cows in a vacuum. I tell him that, yes, things are complicated, but even if you manage to solve the Navier-Stokes equations and then the Einstein Field Equation for a coin falling off a bench the answer would only be different from the high school answer by the 5th decimal point.

But it's not that, you see they don't teach you about gravity because it is a problem to solve, we're taught it because *it is*. On a different planet without an atmosphere, some dufus like you is saying "but you ignored the Casimir effect" or whatever.

But it is not that either, this is a certain craft, to sit down, pay attention, recognize that it isn't obvious, and figure it out. It is hard to phrase. My heroes are Euler, Lagrange, Abel. I've no way of saying this in any way that would be taken seriously.

It's not as if mathematicians like these do not exist among us, as if unlike us they don't read thick volumes. They do it all the same - buy milk, meet cats, fix ties, what they also do is read mathematics, quietly and doggedly understand things an evening and come out to have tea.

For all of the days since September, I've had Feynman on the only window of my room because I read his chapter on the Ratchet and Pawl mechanism. This is the thing that makes the only granny clocks work, a small toothed-gear fixed against a bent tooth, the mechanism can only turn in one way. This is a method to turn natural chaos to order - but this cannot be, going forwards in time, natural chaos only increases (this is 2nd law of thermodynamics, grossly simplified). Feynman argues that the Brownian Ratchet (thought experiment) does not upset the law, and everything is bounded and it works out. This small, small idea, is the genesis of motion at the molecular scale. Have you wondered how nutrients are transported to the nucleus of the cell? How things in general that are alive, small and made of atoms move in one direction? Have you seen how kinesins "walk" on microtubules? (look it up)

With the craft, it is required of you some tenaciousness - the capacity to call out bs. Which is ofcourse a technical term. I read the first half of the essays in *What Do You Care What Other People Think?* on a train returning from home. The first essay is nothing short of a liturgy to this tenaciousness. It goes around him walking in the woods with his father and noticing, birds, leaves, lice. You could ask a physicist whether a photon is wave or particle and a good one will tell you a photon behaves as itself with the

statistics of a boson (this is not helpful, yes, but it is correct). You could ask why statistics at small scales involve imaginary numbers, and a good one will hesitate before telling you because *it is* that way, and by the way, *all numbers* are imaginary. It requires again and again an attentiveness from you that is embarrassing. "I don't really want to be witnessed talking to the catbirds / or hugging the old black oak tree. I have my way of / praying, as you no doubt have yours." — (*How I Go Into the Woods* by Mary Oliver) The second essay about his first wife Arlene during his time in Los Alamos is beautiful, and I excuse myself out the crowded berth to the bathroom to cry.

There is an essay in the book, titled *Feynman Sexes Pig*, about a few protesters coming into one of his talks pointing out some trivial misogyny in his printed lectures. It is strange and written in the tone of a regular (almost caricatured) bigot. After the first two essays the book falls off. I get down the train.

Around a week ago, Angella Collier, a keen voice in recent physics released a (long) video on the *sham legacy of Richard Feynman*. Feynman never wrote a book. It is a long story. The Lectures were delivered by Feynman and compiled, fact-checked, ordered, made exercises for, by a whole team of people, one of whom was Bob Leighton. In his 50s, Feynman became friends with Bob's son, Ralph.

There's a popular story in this myth how he divorced Mary Louise Bell, who walked off citing her reasons - "[he was] constantly working calculus problems in his head as soon as awake, while driving car, sitting in living room, and so forth" the less-known portion of the sentence goes on "when she unwittingly disturbed either calculus or his drums he flew into a violent rage, during which time he choked her". Also known, during this time, a no-fault divorce did not exist and divorce at all permitted only on the grounds of "extreme cruelty". Still, what do you know.

People, heroes - faulty, despite brilliance, it is easy to see them as figures of a thing that you feel in your bones but yet need desperately some evidence for, on your windows. The technical term for which is bs. He stayed there from all the days since september till beginning December.

You are a product of other people. Simple, faulty, ultimately normal people. You learn.

Dick Feynman, I don't know you.

Together they played drums and told stories which Ralph recorded, and published, in first person narrative, as 2 definitive "autobiographies".

The story with Arlene, as Leighton put it, was "assembled over the past ten years out of pieces from six different stories". This story is true-er: a lanky Jewish immigrant boy in New York, very very concerned not to be seen as a "sissy", the pick-up artist stories in *Surely Your Joking*, him scoring ladies left and right, the sizing up buff men in bars, the practical jokes, the smartest guy in the room - his letters written with genuine love to Arlene, and Michelle, a father to daughter. What do you know.

