Free Will, commissioned for Times Literary Supplement

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Much of what physics tells us about the universe has been surprising. We are accustomed to reports from the frontiers of science about dark matter, colliding black holes, quantum entanglement, and teleportation. About such matters most of us cede our opinions to physics, and we do so without practical discomfort. Beliefs about what happens in the far reaches of space or below the Planck scale are wonder-inducing curiosities, but they aren't going to make a difference to our daily lives.

There are places closer to the human scale, however, where science challenges beliefs about ourselves and our place in the world in a manner that is more unsettling [unsettling?]. Foremost among these is the problem of free will.

Here's how it goes. When we make a choice – a trivial one or a big one - it seems to us that the choice makes the difference between two possible futures, and that there was nothing set in stone in advance that determined the outcome. But with the advent of classical mechanics in the 17th century it became possible to write down equations that, in conjunction with a complete specification of the initial conditions of the universe, could in principle allow us to predict everything that we will do – every movement we will ever make, every word we will ever speak. These equations aren't speculations. They are the first equations you learned in your freshman physics course, the equations that let us calculate the motion of a pendulum and the trajectories of the planets. They are the equations that describe the laws that keep airplanes in the air and bridges from collapsing under the weight of cars. These equations, tested and confirmed time and again, allow us, in principle, to calculate within measureable precision the movements of every body in the universe, given enough information about its past. . There are some corrections to the equations that make a difference at velocities close to the speed of light, and when we look at how things move a very small scale (a length about 10^{-20} times the diameter of a proton), but those corrections are well understood and don't (except under very special and hard-to-realize conditions) make a difference for the movements of things as big and slow as us.

What that means is that, any universe that was started in the same global state as ours 14 billion years ago (roughly the age of the observable universe), with all of the particles in the same positions, with the same momenta, would have eventually, and by just the same route, given rise to you and I, and that we would have all of the same experiences and all of the same thoughts and feelings and

make all of the same decisions. And it means that as you toss and turn in the throes of a difficult decision, there is really only one possible outcome. You are no more free to choose otherwise than you do, than water is, to flow uphill.

This problem has been around for millennia, but physics gives it a precise formulation and a concrete setting. It's a beautiful problem because it brings physics into contact with issues of central human concern and forces us to think hard, in concrete detail, about what a scientific view of the world really entails about ourselves. The problem confronts us with a vision of human action that appears to be irreconcilable with the way we experience the world.

What do I mean by 'the way we experience the world'? It's hard to pin down. More basic than a belief but more articulate than a sensation, it's the sense you have when making a decision that it is open to you – open right up until the last second - to act in any one of a number of different ways. The best description I've read is from William James:

"The great point is that the possibilities are really *here*... at those soul-trying moments when fate's scales seem to quiver, and good snatches the victory from evil or shrinks nerveless from the fight, … the issue is decided nowhere else than *here* and *now*."

The reality of the possibilities is what gives weight to our decisions. It is what keeps us up at night. It is what bestows urgency on sorting out what to do. It is what – as James puts it – "gives the palpitating reality to our moral life and makes it tingle, … with so strange and elaborate an excitement". We think that the past prepares us but then leaves us on the threshold of our dark nights, like a mother who must drop her child's hand at the school door to fend for himself. We think that the decision itself is fixed only and ultimately by what happens between these two walls in the lonely interval between dusk and dawn.

And it is the reality of the possibilities that physics seems to contradict.

Some claim that the idea of human freedom is built on illusions about human specialness that are a holdover from a religious conception of the world, and that they should be swept aside with the advancing tides of science. This position has been trumpeted loudly by people who present themselves as brave defenders of science: scientists like Stephen Hawking, Einstein, and Richard Dawkins and philosophers like Alexander Rosenberg and Sam Harris. To most people, however, it seems literally *unbelievable* that the scales of fate don't hang in the balance while they are tossing and turning about a difficult decision. And it is not just those dark nights of the soul. If you are like me, you think that every choice is a juncture in history whose outcome it falls to you, in the here and now, to determine. You think that you could cross the street here *or* there, pick these socks *or* those, go to bed at a reasonable hour *or* stay up, howl at the moon and eat donuts till dawn.

And yet, if there is one foundational belief in science, it is that things can't happen that the laws of physics don't allow. And the clash between these two things shows that there is something centrally important about ourselves and our position in the cosmos that we don't understand.

So far I've been speaking as though the problem of free will is the problem of how to reconcile what physics says about our actions with our experience of them. This aspect of the problem is one that a lot of people latch onto, when they first encounter it. But there's a much more serious aspect of the problem that reveals itself when we consider the practice of holding people morally responsible for their actions. Consider the crime made famous by Truman Capote's *In Cold Blood.* On the night of Nov. 14, 1959 Perry Smith and Richard Hickock entered the home of Herb Clutter and his family in Holcomb, Kansas, while they slept. Armed with a knife and a 12-gauge shotgun, and believing that Clutter kept large amounts of cash in a safe, the pair drove four hundred miles with the intention of robbing the family. In the house were Herb Clutter, his wife, and the Clutter's two teenage daughters. On discovering there was no safe, Smith and Hickock bound and gagged the family. They continued to search for money, but found little of value in the house. Smith then slit Herb Clutter's throat and shot him in the head. Kenyon and Nancy, Clutter's 15 and 16 year old daughters, were killed with gunshots to the head. Mrs. Clutter was killed last. Smith confessed to all the murders, and then refused to sign the confession, claiming that he only confessed because he felt sorry for Hickock's mother, though Capote himself believed that he Smith pulled the trigger. From the crime the two netted a small portable radio, a pair of binoculars, and less than fifty dollars in cash. The radio and binoculars, which remained in their possession, would later lead to their conviction.

These were methodical, personal killings, at close range, that would have been difficult to commit without looking into the faces of the victims. These weren't crimes committed in the heat of battle, or under any kind of threat. Smith and Hickock weren't children, cognitively disabled, or frightened for their own lives. They were considered actions undertaken by grown men, calmly and without present danger. The events unfolded over the course of a night in which the criminals made deliberate decisions to perpetrate spectacular violence. On killing Herb Clutter, Smith later told Capote, "I didn't want to harm the man. I thought he was a very nice gentleman. Soft spoken. I thought so right up to the moment I cut his throat."

Capote tells the story in patient, articulate detail, portraying Smith's slow drift from troubled childhood to murder, in a manner that blurs the line between agency and circumstance. But the crime itself evokes anger and moral revulsion, and that's because we assume that even once all the external influences that made Smith who he was are taken into account, he still could have walked away that night without committing senseless murder. He chose not to, and he is to blame for that choice.

Determinism looks like it pulls the rug out from under the presumption that Smith could have walked away. The worry is that if the physical laws are deterministic, they leave no room whatsoever for any

contingency about what will happen once the initial conditions of the universe are set. Smith and Hickock were products of a history that could only unfold in one way, as a matter of physical law, from its early origins. The facts of the early universe left no room for them to do anything but make the choices that they made. It's not that people's choices don't make a difference to what they do, it's that their choices are themselves fixed by facts that were in place 14 billion years ago; long before either of them was conceived. When the NRA says 'Guns don't kill people; people kill people', they mean to be pointing to the person holding the gun as the real locus of control, and the one responsible for the damage caused by a bullet, because the gun has no choice about what to do. The worry raised by determinism is that the person - no less than the gun - is but one part of the landscape the causal chains pass through. Maybe people don't kill people either. Maybe the initial conditions of the universe do.

Putting this in argument-form can clarify the worry so that we can examine the reasoning it involves. Here is the simplest and most direct version of the argument for the incompatibility of determinism and free will.

Determinism entails that the facts of the past, in conjunction with the laws of nature, entail every truth about the future.

The past is not under our control.

Laws of nature are not under our control.

Our actions are entailed by past and laws of nature.

Hence, our actions are not under our control.

People commonly wonder why the problem is still a live one, since our best current microphysical theories—quantum mechanics, and quantum field theory—are not (on the standard interpretation) deterministic. But lest you think that while Newtonian physics got us into the problem, quantum physics gets us out of it, there's a simple, all-purpose, revision of the argument that seems to work just as well in a quantum setting:

Quantum mechanics entails that the facts of the past, in conjunction random uncontrollable sub-microscopic events—like the decay of a radium atom at a particular time, or the deflection of an electron on a particular place on a photographic plate—entail (via natural laws) every truth about the future.

The past is not under our control.

Chancy quantum departures from determinism are not under our control.

Laws of nature are not under our control.

Our actions are entailed by past and laws of nature.

Hence, our actions are not under our control.

This last observation is important, because it helps us home in on the kind of control that seems essential to human freedom. We don't want our actions to be controlled by the initial conditions of the universe, and we don't want them to be controlled by random sub-microscopic events in the brain. We – ourselves – want to control our actions. We want to get ourselves into the causal chain. We want choices that make difference between whether we A or B, and do so, independently of what is going on outside of us. And we want our decisions to come from us.

This transforms the problem from the relatively shallow one of reconciling the rigid necessity of physics with the felt spontaneity of action – i.e., the lived feeling that at any point in your life, you could act in any one of a number of ways, not just on those dark nights of the soul but every time you order a meal – into one that engages with deep human questions about what we are, both as individuals and as a species. It also moves the question outside of the simple setting of physics. The question 'what am I? And how do I fit into the cosmic architecture?' is one of the oldest philosophical questions there is. Linking the question to moral responsibility gives us more traction because it forces us to think about what makes another human being an appropriate target for moral emotions like praise and blame, not to mention love, admiration, anger and contempt.

Science won't answer these questions, but it provides us with the right setting in which to address them, if we do not want to rely on magical thinking. The fact that science is forcing us to confront questions like this - questions that go right to the heart of our self-understanding, and that make a difference to how we treat one another - shows us that it has reached the stage of maturity at which it is no longer simply an apparatus for controlling and predicting nature. It is a world-view, ripe for philosophical elaboration.

Perennial problems like free will and determinism may evoke yawns in people impatient with lack of progress. But the fact that such problems span cultures and eras, and that they immediately grip even those without training in physics or philosophy, suggests that they reveal tensions that lie deep within human thought. I remain convinced that there is a way of moving past the surface clash, and of bringing the sharp edges of our beliefs, concepts, and practices into line. Philosophy is at its best when it is digging around at corners in our world-view that we don't understand, forcing us to think hard about fundamental matters. In philosophy, as in science, it is by digging around at the places

that we don't understand that we are most likely to arrive at new insights. I agree with William James when he says:

"A common opinion prevails that the juice has ages ago been pressed out of the free-will controversy, and that no new champion can do more than warm up stale arguments which everyone has heard. This is a radical mistake. I know of no subject less worn out, or in which inventive genius has a better chance of breaking open new ground--not, perhaps, of forcing a conclusion or of coercing assent, but of deepening our sense of what the issue between the two parties really is, of what the ideas of fate and of free will imply."

Three very different new books by Paul Russell, Alfred R. Mele, and Thomas Pink display the richness of the philosophical literature generated by reflection on the problem. Paul Russell's book (*The Limits of Agency: Selected Essays*. OUP 2017) consists of a set of papers written over three decades on questions related to moral responsibility. The papers engage a range of allied fields from law and moral psychology to theology and neuroscience. There are papers devoted to the challenge of moral skepticism; moral sentiment and moral capacity; necessity and the metaphysics of causation; practical reason; free will and art; fatalism; and pessimism vs. optimism as a metaphysical attitude. Russell's theoretical attitude towards human freedom is neither black nor white. He rejects unqualified skepticism about moral responsibility but holds that our pre-theoretic view of ourselves as a free and ultimate source of action is severely tempered by what science is telling us about ourselves. One can dip into this book, reading the articles individually. They stand alone quite well as treatments of particular topics.

Alfred R. Mele's book is a different kind of beast. Where Russell's book is rooted in history, and looks outward, actively engaging other fields, Mele's book has a narrow focus on one strand of argument in the contemporary discussion, and is best seen as a contribution to a wider literature. Mele has been one of the most important and best exemplars of the contemporary analytic discussion of free will; which has seen vigorous activity in the last two decades in no small part due to Mele's influence. This area is a forest of definitions, analysis, and close examination of arguments that have been developed to distinguish positions in what has come to be a rather articulated landscape. *Aspects of Agency* (2017) is a deep draught of the literature in this genre. Mele defends the view that holds that moral responsibility is incompatible with free will and that an action is free just in case it is caused in the right way by an agent's decision against objections that have been advanced. This literature can be difficult to penetrate from the outside because of the baroque terminology so one can't dip into it easily, but if one has the patience, it holds its own rewards.

Thomas Pink rejects some of the terms that frame the contemporary debate in the literature. It is usually assumed in that literature that freedom involves the ability to act otherwise than we do.

Pink argues that freedom need not involve the ability to act otherwise than we do. It comes instead from a more basic power to determine for ourselves what we do. *Self-Determination* (OUP, 2016) is a sustained and careful meditation on what it means to determine for yourself what you do. This is a question that any thoughtful person has asked himself, and repays reflection quite independently of any worries about determinism.