The question of free will touches nearly everything we care about. Morality, law, politics, religion, public policy, intimate relationships, feelings of guilt and personal accomplishment—most of what is distinctly *human* about our lives seems to depend upon our viewing one another as autonomous persons, capable of free choice. If the scientific community were to declare free will an illusion, it would precipitate a culture war far more belligerent than the one that has been waged on the subject of evolution. Without free will, sinners and criminals would be nothing more than poorly calibrated clockwork, and any conception of justice that emphasized punishing them (rather than deterring, rehabilitating, or merely containing them) would appear utterly incongruous. And those of us who work hard and follow the rules would not "deserve" our success in any deep sense. It is not an accident that most people find these conclusions abhorrent. The stakes are high.

In the early morning of July 23, 2007, Steven Hayes and Joshua Komisarjevsky, two career crimi-

nals, arrived at the home of Dr. William and Jennifer Petit in Cheshire, a quiet town in central Connecticut. They found Dr. Petit asleep on a sofa in the sunroom. According to his taped confession, Komisarjevsky stood over the sleeping man for some minutes, hesitating, before striking him in the head with a baseball bat. He claimed that his victim's screams then triggered something within him, and he bludgeoned Petit with all his strength until he fell silent.

The two then bound Petit's hands and feet and went upstairs to search the rest of the house. They discovered Jennifer Petit and her daughters—Hayley, 17, and Michaela, 11—still asleep. They woke all three and immediately tied them to their beds.

At 7:00 a.m., Hayes went to a gas station and bought four gallons of gasoline. At 9:30, he drove Jennifer Petit to her bank to withdraw $15,000 in cash. The conversation between Jennifer and the bank teller suggests that she was unaware of her husband's injuries and believed that her captors would release her family unharmed.

While Hayes and the girls' mother were away, Komisarjevsky amused himself by taking naked photos of Michaela with his cell phone and masturbating on her. When Hayes returned with Jennifer, the two

men divided up the money and briefly considered what they should do. They decided that Hayes should take Jennifer into the living room and rape her—which he did. He then strangled her, to the apparent surprise of his partner.

At this point, the two men noticed that William Petit had slipped his bonds and escaped. They began to panic. They quickly doused the house with gasoline and set it on fire. When asked by the police why he hadn't untied the two girls from their beds before lighting the blaze, Komisarjevsky said, "It just didn't cross my mind." The girls died of smoke inhalation. William Petit was the only survivor of the attack.

Upon hearing about crimes of this kind, most of us naturally feel that men like Hayes and Komisarjevsky should be held morally responsible for their actions. Had we been close to the Petit family, many of us would feel entirely justified in killing these monsters with our own hands. Do we care that Hayes has since shown signs of remorse and has attempted suicide? Not really. What about the fact that Komisarjevsky was repeatedly raped as a child? According to his journals, for as long as he can remember, he has known that he was "different" from other people, psychologically damaged,

and capable of great coldness. He also claims to have been stunned by his own behavior in the Petit home: He was a career burglar, not a murderer, and he had not consciously intended to kill anyone. Such details might begin to give us pause.

As we will see, whether criminals like Hayes and Komisarjevsky can be trusted to honestly report their feelings and intentions is not the point: Whatever their conscious motives, these men cannot know why they are as they are. Nor can we account for why we are not like them. As sickening as I find their behavior, I have to admit that if I were to trade places with one of these men, atom for atom, I would *be* him: There is no extra part of me that could decide to see the world differently or to resist the impulse to victimize other people. Even if you believe that every human being harbors an immortal soul, the problem of responsibility remains: I cannot take credit for the fact that I do not have the soul of a psychopath. If I had truly been in Komisarjevsky's shoes on July 23, 2007—that is, if I had his genes and life experience and an identical brain (or soul) in an identical state—I would have acted exactly as he did. There is simply no intellectually respectable position from which to deny this. The role of luck, therefore, appears decisive.

Of course, if we learned that both these men had been suffering from brain tumors that explained their violent behavior, our moral intuitions would shift dramatically. But a neurological disorder appears to be just a special case of physical events giving rise to thoughts and actions. Understanding the neurophysiology of the brain, therefore, would seem to be as exculpatory as finding a tumor in it. How can we make sense of our lives, and hold people accountable for their choices, given the unconscious origins of our conscious minds?

Free will *is* an illusion. Our wills are simply not of our own making. Thoughts and intentions emerge from background causes of which we are unaware and over which we exert no conscious control. We do not have the freedom we think we have.

Free will is actually more than an illusion (or less), in that it cannot be made conceptually coherent. Either our wills are determined by prior causes and we are not responsible for them, or they are the product of chance and we are not responsible for them. If a man's choice to shoot the president is determined by a certain pattern of neural activity, which is in turn the product

of prior causes—perhaps an unfortunate coincidence of bad genes, an unhappy childhood, lost sleep, and cosmic-ray bombardment—what can it possibly mean to say that his will is "free"? No one has ever described a way in which mental and physical processes could arise that would attest to the existence of such freedom. Most illusions are made of sterner stuff than this.

The popular conception of free will seems to rest on two assumptions: (1) that each of us could have behaved differently than we did in the past, and (2) that we are the conscious source of most of our thoughts and actions in the present. As we are about to see, however, both of these assumptions are false.

But the deeper truth is that free will doesn't even correspond to any *subjective* fact about us—and introspection soon proves as hostile to the idea as the laws of physics are. Seeming acts of volition merely arise spontaneously (whether caused, uncaused, or probabilistically inclined, it makes no difference) and cannot be traced to a point of origin in our conscious minds. A moment or two of serious self-scrutiny, and you might observe that you no more decide the next thought you think than the next thought I write.

The Unconscious Origins of the Will

We are conscious of only a tiny fraction of the information that our brains process in each moment.[1] Although we continually notice changes in our experience—in thought, mood, perception, behavior, etc.—we are utterly unaware of the neurophysiological events that produce them. In fact, we can be very poor witnesses to experience itself. By merely glancing at your face or listening to your tone of voice, others are often more aware of your state of mind and motivations than you are.

I generally start each day with a cup of coffee or tea—sometimes two. This morning, it was coffee (two). Why not tea? I am in no position to know. I wanted coffee more than I wanted tea today, and I was free to have what I wanted. Did I consciously choose coffee over tea? No. The choice was made for me by events in my brain that I, as the conscious witness of my thoughts and actions, could not inspect or influ-

ence. Could I have "changed my mind" and switched to tea before the coffee drinker in me could get his bearings? Yes, but this impulse would also have been the product of unconscious causes. Why didn't it arise this morning? Why might it arise in the future? I cannot know. The intention to do one thing and not another does not originate in consciousness—rather, it *appears* in consciousness, as does any thought or impulse that might oppose it.

The physiologist Benjamin Libet famously used EEG to show that activity in the brain's motor cortex can be detected some 300 milliseconds before a person feels that he has decided to move.[2] Another lab extended this work using functional magnetic resonance imaging (fMRI): Subjects were asked to press one of two buttons while watching a "clock" composed of a random sequence of letters appearing on a screen. They reported which letter was visible at the moment they decided to press one button or the other. The experimenters found two brain regions that contained information about which button subjects would press a full *7 to 10 seconds* before the decision was consciously made.[3] More recently, direct recordings from the cortex showed that the activity of merely 256 neu-

rons was sufficient to predict with 80 percent accuracy a person's decision to move 700 milliseconds before he became aware of it.[4]

These findings are difficult to reconcile with the sense that we are the conscious authors of our actions. One fact now seems indisputable: Some moments before you are aware of what you will do next—a time in which you subjectively appear to have complete freedom to behave however you please—your brain has already determined what you will do. You then become conscious of this "decision" and believe that you are in the process of making it.

The distinction between "higher" and "lower" systems in the brain offers no relief: I, as the conscious witness of my experience, no more initiate events in my prefrontal cortex than I cause my heart to beat. There will always be some delay between the first neurophysiological events that kindle my next conscious thought and the thought itself. And even if there weren't—even if all mental states were truly coincident with their underlying brain states—I cannot decide what I will next think or intend until a thought or intention arises. What will my next mental state be? I do not know—it just happens. Where is the freedom in that?

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Imagine a perfect neuroimaging device that would allow us to detect and interpret the subtlest changes in brain function. You might spend an hour thinking and acting freely in the lab, only to discover that the scientists scanning your brain had been able to produce a complete record of what you would think and do some moments in advance of each event. For instance, exactly 10 minutes and 10 seconds into the experiment, you decided to pick up a magazine from a nearby table and begin reading, but the scanner log shows this mental state arising at 10 minutes and 6 seconds—and the experimenters even knew which magazine you would choose. You read for a while and then got bored and stopped; the experimenters knew you would stop a second before you did and could tell which sentence would be the last you read.

And so it would go with everything else: You tried to recall the name of the lead experimenter, but you forgot it; a minute later you remembered it as "Brent" when it was actually "Brett." Next, you decided to go shopping for new shoes after you left the lab—but on second thought, you realized that your son would be

getting out of school early that day, so you wouldn't have enough time to go shopping after all. Imagine what it would be like to see the time log of these mental events, alongside video of your associated behavior, demonstrating that the experimenters knew what you would think and do just before you did. You would, of course, continue to feel free in every present moment, but the fact that someone else could report what you were about to think and do would expose this feeling for what it is: an *illusion*. If the laws of nature do not strike most of us as incompatible with free will, that is because we have not imagined how human behavior would appear if all cause-and-effect relationships were understood.

It is important to recognize that the case I am building against free will does not depend upon philosophical materialism (the assumption that reality is, at bottom, purely physical). There is no question that (most, if not all) mental events are the product of physical events. The brain is a physical system, entirely beholden to the laws of nature—and there is every reason to believe that changes in its functional state and material structure

entirely dictate our thoughts and actions. But even if the human mind were made of soul-stuff, nothing about my argument would change. The unconscious operations of a soul would grant you no more freedom than the unconscious physiology of your brain does.

If you don't know what your soul is going to do next, you are not in control. This is obviously true in all cases where a person wishes he could feel or behave differently than he does: Think of the millions of committed Christians whose souls happen to be gay, prone to obesity, or bored by prayer. However, free will is no more evident when a person does exactly what, in retrospect, he wishes he had done. The soul that allows you to stay on your diet is just as mysterious as the one that tempts you to eat cherry pie for breakfast.

There is a distinction between voluntary and involuntary actions, of course, but it does nothing to support the common idea of free will (nor does it depend upon it). A voluntary action is accompanied by the felt intention to carry it out, whereas an involuntary action isn't. Needless to say, this difference is reflected at the level of the brain. And what a person consciously intends to do says a lot about him. It makes sense to treat a man who enjoys murdering children differently from one

who accidentally hit and killed a child with his car—because the conscious intentions of the former give us a lot of information about how he is likely to behave in the future. But where intentions themselves come from, and what determines their character in every instance, remains perfectly mysterious in subjective terms. Our sense of free will results from a failure to appreciate this: We do not know what we intend to do until the intention itself arises. To understand this is to realize that we are not the authors of our thoughts and actions in the way that people generally suppose.

Of course, this insight does not make social and political freedom any less important. The freedom to do what one intends, and not to do otherwise, is no less valuable than it ever was. Having a gun to your head is still a problem worth rectifying, wherever intentions come from. But the idea that we, as conscious beings, are deeply responsible for the character of our mental lives and subsequent behavior is simply impossible to map onto reality.

Consider what it would take to actually have free will. You would need to be aware of all the factors that determine your thoughts and actions, and you would need to have complete control over those factors. But

there is a paradox here that vitiates the very notion of freedom—for what would influence the influences? More influences? None of these adventitious mental states are the real you. You are not controlling the storm, and you are not lost in it. You *are* the storm.

Changing the Subject

It is safe to say that no one was ever moved to entertain the existence of free will because it holds great promise as an abstract idea. The endurance of this notion is attributable to the fact that most of us *feel* that we freely author our own thoughts and actions (however difficult it may be to make sense of this in logical or scientific terms). Thus the idea of free will emerges from a felt experience. It is, however, very easy to lose sight of this psychological truth once we begin talking philosophy.

In the philosophical literature, one finds three main approaches to the problem: *determinism*, *libertarianism*, and *compatibilism*. Both determinism and libertarianism hold that if our behavior is fully determined by background causes, free will is an illusion. (For this reason they are both referred to as "incompatibilist" views.) Determinists believe that we live in such a world, while libertarians (no relation to the political philosophy that goes by this name) imagine that human agency must