we have been unable to identify, measure, or manipulate the various components that go into such self-modulation. Those days are now ending, and everyone from advertisers to political consultants increasingly understands, in voluminous biological detail, how to manipulate consciousness in ways that weaken our notion of free will.

In the coming decades, our social and political concept of free will, based as it is on ignorance of its mechanisms, will be destroyed by what we learn about the actual workings of the brain. We can wait for that collision and decide what to do at that point, or we can begin thinking through what sort of legal, political, and economic systems we will need in a world in which our old conception of free will has been rendered inoperable.

In J. Brockman (Ed.), What's your dangerous idea? (pp. 263-264). Harper Perennial.

The Limits of Introspection

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Conscious awareness makes up a sliver of the stuff the mind does. But it's the only aspect of the mind we subjectively experience, and hence the only aspect we believe exists. The truth is that thoughts, feelings, and behavior operate largely without deliberation or conscious recognition. It is the routinized, automatic, classically conditioned, precompiled aspects of our thoughts and feelings that make up a large part of who we are. We don't know what motivates us, even though we are certain we know just why we do the things we do, choose as we do, take action as we do. We have no idea that our perceptions and judgments are incorrect (as measured objectively), because we aren't confronted with such evidence, precisely because it remains outside our conscious awareness. We don't recognize that our behavior is often at variance with our own intentions and aspirations. The limits on introspection create bounds on our ethical judgments, not just on how we view the physical world.

The physiologist Helmholtz's notion of unconscious infer-

ence refers to the automatic act of making sense of what is perceived—without asking anybody's permission to go beyond the percept. When an action is observed—a simple action, such as a person reaching into a pocket—an unconscious inference occurs. In context, the movement is assumed to produce a wallet, or a diaper, or a stethoscope, or a gun. Such inferences, when they occur in ordinary social interaction, rely on the social categories that people belong to. Why assume that a grandmother leaning over a child is going to pull out a gun when a diaper is likely? So ordinary are such inferences that it makes sense that they happen rapidly and unconsciously.

From the objective analysis of mental processes, a science barely over a hundred years old, we know a lot about the very stuff we cannot intuit. We know, for instance, that fearing what is different from oneself is common. We know that disliking what is not part of the dominant part of social hierarchies is common. Put these together and what results is a particularly strong preference that majority-group members in any culture have for their own over others. Such tendencies to prefer one's own and prefer what's dominant is natural in the sense that it is a part of our evolutionary heritage and reinforced through learning that emphasizes the "goodness" of one's own country, religion, and race/ethnicity. To recognize that in the world today what constitutes one's own group is complex, and what it means to be on the side of the dominant is not so clear (let alone morally questionable), shows the massive disadvantage of working without introspective access to such proclivities.

The mind sciences have made it possible to look inward, into the universe we carry around in the three-pounder in our heads, and in so doing we've learned about the strong limits on our power of introspection and the moral consequences of such limits. The ability to be fair in judging others objectively, the ability to act in accord with intention, the ability to treat members of ingroups and outgroups equally, the likelihood of privileging those who come from dominant and subordinate groups—these are heavily compromised mental acts, and invisibly so.

The only way out is to explore and understand the mind, using verifiable methods and confronting the facts that are tumbling out about who we are, without flinching. As everybody's favorite biologist, Richard Dawkins, said some thirty years ago: "Let us understand what our own selfish genes are up to, because we may then at least have a chance to upset their designs, something that no other species has ever aspired to do." The advice comes in handy, as we discover the "mind bugs" that allow us to lead ourselves astray by denying ourselves (our conscious selves) access to the origins of out most fundamental thoughts and feelings.

Emily Dickinson wrote these words in a letter to a mentor asking him to tell her whether she was a decent poet: "The sailor cannot see the north, but knows the needle can." Without clear introspective access, we are such sailors. But a fact of life in this century is that we have the needle—in fact, several needles, the ones from science being the most obvious. These needles point toward the next (perhaps last?) frontier: that of allowing us to understand not just our place among other planets, our place among other species, but the very core of our nature.