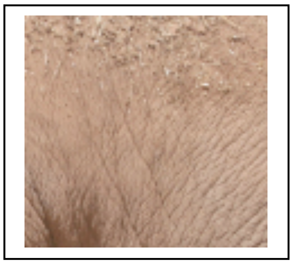
The Whole Elephant or Adventures in Consilience

An ancient East Indian story tells us about several blind men who came upon an elephant. One touched his tail and thought the elephant was like a rope. Another touched his ear and believed an elephant was like a rug. Still another touched his leg and said, "This beast is like a pillar!" Since none of them could see the whole elephant, they didn't have the joy of knowing the magnificence of the animal. When we pursue consilience, a notion coined by E. O. Wilson, we begin to delight in the convergence of findings from different fields, possibly catching glimpses of truth.



James Fallon, a neuroscience researcher at the University of California-Irvine, had studied the brains of psychopaths for 20 years. He then learned from his aging mother that several members of his family on his father's side had a history of murderous violence. A history that even includes the infamous (and controversially acquitted) Lizzy Borden. Since there seems to be a confluence of brain structure, genes, and relational experience in the creation of such a propensity toward violence, he decided to do brain scans and DNA tests on his family—including himself. Everyone had peaceable brains, except him. His scan revealed there was little activity in his orbitofrontal cortex, a region of the brain that grants us the capacity for empathy and impulse control. When it is largely inactive, it cannot regulate the amygdala, so whatever implicit memories are encoded there can rush to the fore without modulation when inner or outer experience activates these neural nets. This is where family history comes in. When this inadequate brain structure is coupled with amygdala-based, early-forming implicit memories of terror, pain, and rage, the brain is left with a hypersensitive amygdala, a nervous system that is always on guard, and mental models that say that people are dangerous. In addition, we also internalize the states of mind of our perpetrators, adding to the pressure to flare up violently in circumstances that reconnect us to the original wound.

As if this weren't enough, sometimes this pattern of structure and experience is accompanied by a variation of a gene that deals with serotonin—the MAO-A gene. A certain allele causes the brain to be flooded with serotonin in utero, rendering the brain insensitive to the normal emotion-regulating flow of serotonin after birth. Researchers call this the "warrior gene" because of its association with violence. Jim Fallon also found this gene in the analysis of his DNA. He said, "In a sense, I'm a born killer." However, his childhood was supportive, encouraging, and warm, so his amygdala does not contribute terror, anguish, or rage to the mix. We can also imagine the presence of caring others inside, and the flow of oxytocin and the other neurochemicals of attachment helping to balance his system and grant him the feeling of connection. As in other studies, relational goodness seems to often be able to trump genetics.

Researchers these days are open to considering the question of whether particular brain structures and functions are a product of genetics or take those shapes under the impact of early brain-building relationships. This is a most valid and important question. However, the fact that James Fallon has few

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connections between his orbitofrontal cortex and limbic region, in spite of the kind of attachment experiences that usually create rich wiring between these circuits, does suggest that genetics has a prominent place in this particular discussion.

That being the case, it makes some sense that these research findings are making their way into courtrooms deciding the fate of violent perpetrators. If both the MAO-A gene variant and low connectivity between these vital regulating circuits encounters early trauma, then perhaps the offender is incapable of sufficient control even when he or she cognitively knows the difference between right and wrong. Interpersonal neurobiology teaches us that our ability to behave morally has much more to do with right-mode functioning where the capacity for both empathy and flexible decision-making arises, than with our left-mode ability to analyze the morality of any given act.

Kent Kiehl, a professor at the University of New Mexico, is another researcher who has scanned the brains of many incarcerated psychopaths. He finds the same inactive circuitry, and understands this to mean that people born with these damaged circuits have a kind of diminished capacity similar to people with mental retardation—only in the emotional rather than cognitive realm. While the person remains guilty of the crime, perhaps the death penalty should be off the table. These arguments are having mixed results with juries. Brian Dugan, whose crime was against a 10-year-old child, was given the death penalty, notwithstanding his brain scans, while Bradley Waldroup, whose crime involved two adults, received a verdict of voluntary manslaughter rather than first degree murder based on the MAO-A gene variant and a history of abuse.

As technology becomes more sophisticated and as we culturally absorb the meaning of the neuroscience—often a 20-year process, it seems possible that our legal system will undergo a profound shift from a paradigm of crime and punishment to a perspective of informed and compassionate understanding followed by treatment. A long and fascinating road ahead.

The three-part story from NPR:
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