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"Reverse Engineering The Human Brain"

For hundreds of years, humans, philosophers, and scientists have wondered how the human brain worked. Aristotle thought that the mind was in the heart, and that its main purpose was to cool blood. It was first thought that the body operated itself, and then society advanced to learn that the brain was the real controller. However, we've never been able to figure out *how* it works. We've mapped it out into lobes: frontal, parietal, temporal, and occipital. We've discovered which does what, but it's still a mystery how each does it, and how little mistakes in development could alter an entire life. Reverse engineering the brain would be largely beneficial for medical and advancement purposes because it could provide a safer, alternative solution to testing products on animals, help us find preventative routes in the brain for addiction, and could give us an in-depth look at conditions such as autism.

Humans share about 99% of their DNA with chimpanzees, making them the closest living relatives. It's estimated that there are merely 170,000 to 300,000 chimpanzees left in Africa, and their population is decreasing rapidly. Testing on them could drive them into extinction, and yet, testing on other animals would provide even *less* accurate results. Even if so, diseases artificially made in labs may not confine to the organic disease, and the effects produced could be altered. This could mean that all the mice and monkeys tested on are only wasted lives, and considering that 52% of US adults are against animal testing, it would be widely considered less than ideal. Reverse engineering the brain would provide an ethical, accurate way of testing, and many incurable diseases may be able to be resolved.

Addiction affects many people in West Virginia, adults and babies alike. Neonatal Abstinence Syndrome is when a baby is born with withdrawal, and it affects 51.2 out of every 1,000 hospital births. It occurs when a pregnant woman uses drugs during her pregnancy. Overall in 2017, WVproviders wrote 81.3 opioid prescriptions for every 100 people. West Virginia is in the midst of an opioid epidemic; opioids are highly addictive drugs, and some well-known ones are OxyContin and Vicodin. Along with other methods, such as caution with prescriptions and a better addict outreach program, reverse engineering the brain could bring us light into the addictive pathways of the brain and aid us in designing medicated that doesn't activate it, while providing us a foolproof way of testing. It could finally help many West Virginians with their addiction and prevent future generations from engaging in it.

Autism is characterized by proteins in the brain unfolding incorrectly or when they're not supposed to, along with many other things, one of which being that children affected by autism may have a surplus of synapses, which are connections between brain cells. Depending on the type and severity, children with autism can have debilitating daily struggles, and may never be able to live even an average, or independent life. Approximately 1 in 68 children in West Virginia have an Autism Spectrum Disorder, and it could be your future child born afflicted with it. By recreating the brain, we could get a closer study of the causes of autism, and the way it develops it. We could have an analysis of how it's built, and compare it to a "normal" one, and maybe someday be able to resolve it. At the very least, we'd have more information.

Reverse-engineering the brain could save thousands of helpless animals, solve addiction, and help autism. Creatures like chimpanzees could be saved from endangerment, and many residents of West Virginia could lead improved lives, or at least have the knowledge that their

children will.. Looking into the brains of people with autism could help us understand them better, and provide better care. As well as that, West Virginia is in the midst of an opioid epidemic. Many West Virginians could hugely benefit from this, and it could open many opportunities for innovators. Reverse engineering the brain would be a big success for the US as a whole.

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