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Tragic Science: Case Studies of Misuse of Knowledge

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Tragic Science

Case Studies of Misuse of Knowledge

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On TV, science is quick and clean. Scientists are swift, efficient, and can do almost anything, given the resources. However, anyone who has done research or spent sufficient time in a lab can testify that science rarely goes as planned. Rather, science is riddled with failures that ultimately tumble into each other in such a way that human knowledge about the natural world is propelled, whether by leaps or baby steps. Some of these failures are laughable, while others are tragic and end with someone getting hurt. Some of science's greatest tragedies include the willful overlooking of a brilliant, trailblazing femme scientist, despite her central role in one of humanity's significant discoveries; the development, by unknowing researchers, of a weapon that would impact billions of lives; and the introduction of a dangerous, world-changing ideology as a result of entitlement and irresponsible theory.

In 1951, Rosalind Franklin, already known for her study of coal crystals in Paris, arrived at the King's College Biophysics unit in London, unsure of what her next project would be. J.T. Randall, King College's head of Biophysics, recommended she join physicist Maurice Wilkins in his work, using X-ray diffraction to deduce the shape of DNA. Wilkins, who was on vacation during this settling of affairs, returned to his lab, expecting to greet a docile woman ready to act as a Junior Lab Assistant and do whatever he said. Instead, he found Franklin running the lab as if it were her own—let's be real, it practically was.

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Wilkins and Franklin's pairing was an ordeal in and of itself. Wilkins didn't enjoy having his authority in the lab challenged by a woman, and Franklin was not the kind of person to step down for his ego's sake. They were constantly at each other's throats, to an eventual point when the lab had to be split in half, each of the scientists sticking to their own side. In a near boating accident, Franklin even came close to accidentally killing Wilkins. When a friend later joked about her having tried to kill him, everyone laughed rather uncomfortably, unsure whether there could be any element of truth in this suggestion. Apparently, they wouldn't put it past her.

The match-up turned out to be even more problematic when Wilkins, without permission, shared Franklin's data and calculations with a couple of clever boys desperate to make a name for themselves from a nearby university. These boys were James Watson and Francis Crick, and Franklin's data was the missing piece they needed in their research. At first, Watson and Crick were completely unaware that they were working with stolen data. Franklin was furious when she found out, but, seeing how close they were to their goal, eventually helped Watson and Crick make sense of her data. This unorthodox collaboration amounted to the discovery of DNA's three-dimensional structure. Watson and Crick, who unknowingly stole Franklin's data, and Wilkins, who didn't contribute much besides being a terrible lab mate, were awarded a Nobel Prize. Franklin had died four years before the occasion, and the Nobel Prize isn't awarded posthumously. Over the years, Franklin was slighted from recognition in far too many ways.

Another of Maurice Wilkins' contributions to science was his work on the Manhattan Project, a top-secret U.S. government operation that oversaw the development of the atomic bomb. As a response to the Japanese attack on Pearl Harbor in 1941, the first two targets of the atomic bomb were the cities of Hiroshima and Nagasaki, which were devastated by the nuclear blasts. At about 37 sites around the country, including the Los Alamos National Laboratory and the University of Chicago, up to 130,000 researchers had worked on the Manhattan Project. However, most of these researchers were unaware of what their work was being used for—or its implications—until hearing J. Robert Oppenheimer's chilling quote at the project's completion: "Now I am become Death, the destroyer of worlds." Without knowing the full scope of their project, thousands of workers and researchers contributed to the deaths of about 225,000 people.

Sadly, the atomic bomb does not stand alone in its devastating results of scientific endeavors; plenty more scientific failures and successes have resulted in mass death and destruction. For example, prior to and during World War II, the ideology of eugenics spread throughout the U.S. and Europe. This ideology, built on the belief that human evolution should be human-guided, was used to justify the oppression of millions. "Human-guided" eventually took on the meaning of ridding the world of people with traits deemed less than desirable. It started in the U.S. where sterilizations were forced on institutionalized patients, many of whom were women and people of color—society's scapegoats. This ideology, which set the groundwork for fascism and Nazism, was initially supported by many U.S. scientists, and popularly circulated through the media—that is, until the movement grew into the Holocaust, and the inhumane horrors masked behind the ideology could no longer be denied. Even after the Holocaust, the field of eugenics left a legacy of pseudoscience that would be employed to dehumanize Blacks and other people of color.

The damaging theory behind the eugenics movement was originally developed in 1883 by Francis Galton. *In Inquiries into Human Faculty and Its Development*, Galton laid down a general plan to mimic natural selection in order to rid humanity of its "inadequacies". During the development of his theory, Galton designed and honed measuring devices for "favorable" and "unfavorable" characteristics in humans. These devices included the bell-curve, used to determine which groups lacked "favorable" traits, and the concept of "Nature Versus Nurture", which he coined to distinguish between hereditary and environmental traits. Galton proposed that society keep a record of the best families with the best traits and ban "unsuitable marriages."

Ironically, Galton's own feelings of inadequacy seem to have influenced his work. Galton saw himself as a brilliant scientist, with the best education that an upper-class upbringing could afford, yet he felt he never received the recognition he deserved. He felt both inspired and robbed by the success of his cousin Charles Darwin. Galton's theory of eugenics, his claim to prominence, allowed him to divert attention from these feelings of shortcoming and redirect disdain toward targeted demographics while elevating his own social worth. The theory took the world by storm, providing dominating social groups with the means to lash out at oppressed groups, arguably to cover up their own inadequacies or emphasize their power in an already existing social hierarchy. Galton's lust for fame contributed to decades of pseudoscience, oppression, and pain.

As we've seen, science can have very damaging social implications. The realm of science is not as removed from social dynamics and power systems as one may think. Science is often messy, but sometimes it can be *catastrophically* messy, resulting in anything from a researcher's contributions being ignored due to their identity to the unjust deaths and oppression of millions. Knowledge can be an amazing thing. It can be exciting. It can be collaborative and awe-inspiring. But sometimes, knowledge, whether accurate or misguided, can be dangerous.