An Actor Network Theory Analysis of Moral Responsibility for PFOA Contamination

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By

Anna Harris

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On my honor as a University student, I have neither given nor received unauthorized aid on this assignment as defined by the Honor Guidelines for Thesis-Related Assignments.

ADVISOR

Benjamin J. Laugelli, Assistant Professor, Department of Engineering and Society

Introduction

In 2012, PFOA exposure was linked to six disease categories after over a million pounds had been released in Parkersburg, West Virginia (Lerner, 2019). Investigations revealed the chemical was used as a surfactant in the manufacturing of Teflon at DuPont. The results were hundreds of dead animals, dozens of cases of cancer, and more than 3,500 personal injury and wrongful death suits against DuPont (Kelly, 2016). In these cases, the courts ruled the company was liable for negligent contamination (Kelly, 2016).

This case can be used to demonstrate socially harmful corporate behavior. However, there exists little discussion on moral responsibility of the involved actors in the case. This is likely because it may seem obvious since DuPont was held liable by the legal courts. However, only focusing on legal decisions places criteria for liability in existing laws and regulations rather than moral laws and codes of conduct. Additionally, this fails to capture the network that allowed such a wrong to occur. Failure to analyze moral responsibility could lead to an incomplete understanding of ethical accountability of manufacturers, regulators, and company supporters.

I believe studying the case of PFOA contamination in Parkersburg, WV through the lens of actor network theory will help to understand actors' moral responsibility for continued and unregulated chemical contamination. Actor Network Theory (ANT) studies network builders' recruitment of actors towards a common goal (Callon, 1987). ANT will be combined with criteria for moral responsibility, which outlines conditions that must apply for someone to be held accountable (van de Poel & Royakkers, 2015). Specifically, I will demonstrate that DuPont's actions were unacceptable due to wrongdoing in releasing harmful chemicals, contribution to the problem by failing to inform regulators, knowledge of the consequences, and freedom to act by abusing the community's trust and dependence. Responsibility becomes

apparent in internal records, meeting notes, and public statements and interviews. DuPont was able to act in this way since it had created a network allowing for such a corrupt and deceptive scheme to be prolonged, further emphasizing its accountability.

Background

Perfluorooctanoic acid, abbreviated to PFOA or C8, was a chemical used by Dupont's Washington Works facility outside of Parkersburg, WV for the production of Teflon (Sisk, 2021). This "forever chemical" never fully degrades and is now said to be found in the blood of 99.7% of Americans (Lerner, 2019). Managers and directors at DuPont were aware of PFOA's toxicity by the 1960s and its links to cancerous tumors in the early 1990s (Sisk, 2021). Despite this knowledge and internal testing verifying the harmful effects, PFOA was continued to be used and executives failed to inform regulatory bodies or the public (Sisk, 2021). After discovery of the wrongful pollution, legal action began in 2001, and all cases were finally settled in 2017 (Sisk, 2021). For purposes of the following report, DuPont will refer to executives, decision makers, and knowledgeable scientists at DuPont, but not to the general worker as they were uninformed of the consequences and scientific findings until the beginning of legal trials.

Literature Review

Research and analyses currently exist concerning the consequences of the pollution along with DuPont's concealment and denial of the harmful effects of PFOA. These analyses typically focus on the outcomes of assumed unethical actions without fully analyzing responsibilities. However, existing analyses do not fully capture the corrupt network created at DuPont nor the reasons for its ethical accountability for the adverse effects felt in Parkersburg, WV.

In the article *An Ethical Analysis Model to DuPont's PFOA Event Based on Consequentialism Perspective,* the authors employ a utilitarian approach to analyze DuPont's

decisions and actions from the standpoints of individual stakeholders. The article highlights stakeholders and each of the consequences faced as a result of PFOA contamination and continued Teflon production. The results for employees and residents were birth defects and health problems. Consumers were met with the possible release of toxins from nonstick cookware. In the short term, DuPont made a significant amount of money, but in the long term, a damaged company reputation and expensive fines made the production and pollution an overall loss. The authors argue that from a consequentialist standpoint, there were no beneficiaries. Although the paper comes to the conclusion that actions were unethical from a utilitarian perspective, it fails to evaluate DuPont's responsibility and accountability for its actions (Liu et al., 2021).

Additional research exists concerning the broader use of forever chemicals in *The Devil they Knew: Chemical Documents Analysis of Industry Influence on PFAS Science.* By analyzing documents, the authors reveal how manufacturers like DuPont delayed the release of information and therefore regulation. The article highlights the timeline differences between industry knowledge and public knowledge in addition to how DuPont concealed experimental data for decades. DuPont's "vested financial interest in suppressing scientific evidence of the harms of their products" is compared to that of the tobacco industry that long maintained public perception of product safety despite research proving otherwise. The analysis focuses on how a lack of transparency led to significant legal, environmental, and public health consequences (Gaber et al., 2023).

Both articles agree DuPont acted unethically based primarily on utilitarian outlooks that highlight the consequences felt by the company, community, and general public. DuPont is declared guilty in both, yet without a thorough analysis of how this blame was attributed solely

to the corporation. While there is certainly much to be learned from both sources, there is also great value in thoroughly analyzing how DuPont built a network that allowed such corruption to flourish. The current body of research acknowledges DuPont's legal wrongdoing and lack of transparency. However, this paper goes further to determine which actors were morally responsible using an Actor Network Theory framework along with criteria for responsibility. This approach allows for a clearer analysis of involved human actors and highlights where other actors failed to meet a criteria for responsibility while Dupont fulfills them all.

Conceptual Framework

My analysis of PFOA contamination in Parkersburg draws on the science, technology, and society (STS) concept of actor-network theory in conjunction with criteria for responsibility. These frameworks can be methodically applied to identify which actors were morally responsible for the disastrous environmental and health impacts that occurred. ANT can be employed to understand the socio-technical network while criteria for responsibility provides an ethical approach to analyze actors.

John Law defined an actor network as "a combination of social and technical engineering in an environment filled with indifferent or overtly hostile physical and social actors" (Law, 1987). According to ANT, all actors must be accounted for and recruited towards a common goal for a network to function well (Callon, 1987). ANT studies the activity of network builders who recruit human and non-human actors to construct heterogeneous networks to solve a problem or accomplish a goal (Callon, 1987). Translation is the process of forming and maintaining an actor network by assigning actors roles along with translating interests to serve the network as a whole (Callon, 1987).

In terms of analyzing moral responsibility, this is a case of passive responsibility, which is backward looking responsibility that becomes relevant after an undesirable event (van de Poel & Royakkers, 2015). Such cases often involve accountability, blameworthiness, and liability (van de Poel & Royakkers, 2015). To be considered blameworthy and responsible, four conditions must apply: wrong-doing, casual contribution, foreseeability, and freedom (van de Poel & Royakkers, 2015). Wrongdoing is defined as going against either a moral or legal norm. Casual contribution occurs when either an action or failure to act contributes to the consequence under consideration. Foreseeability applies when the person is able to know the consequences, and freedom of action occurs when there is no compulsion or coercion (van de Poel & Royakkers, 2015). Using ANT and criteria for responsibility, I will be able to identify individual actors and determine their accountability. Specifically, I will discuss how the network builder DuPont was able to successfully create a system in which others depended on the corporation, allowing them to contaminate the community without adverse company consequences for many years.

Drawing on ANT, in the analysis that follows I begin by explaining how DuPont executives formed and maintained a network for its goal of continued Teflon production. The company ensured that regulatory bodies like the EPA were trusting and therefore powerless and ensured the community desired the best for the company despite health hazards. Then, I will utilize criteria of responsibility to prove DuPont's blameworthiness for the effects of contamination and pollution while acquitting other actors.

Analysis

In regards to PFOA contamination in Parkersburg, WV, the network builder DuPont is liable based on the four conditions of responsibility. However, the Environmental Protection

Agency (EPA) and community fail to meet all conditions for responsibility. Proof of the four conditions of responsibility are clear in DuPont's internal records from the Haskell Laboratory of Industrial Toxicology, documented meeting notes, and public statements and interviews at the beginning of the trials.

Building of the Network

DuPont was able to build a network towards the goal of continued Teflon production and PFOA contamination. As a multibillion dollar company, recruiting non-human actors such as materials and equipment was rather simple, but more effort was needed to recruit the necessary human actors. DuPont needed to translate the interests of regulatory bodies and the local community to align with production goals.

Drawing on a meeting report from 1984, it is argued that it was economically favorable for DuPont to continue production of Teflon if the probability of being caught was less than 19% (Shapira & Zingales). It is clear from the report and the decision that resulted that DuPont decided to continue production without alterations to its processing because the risk was either perceived or calculated to be low. This is important because the understood low risk illustrates the existing network DuPont had created that essentially allowed self regulation of chemicals and associated hazards. The Toxic Substances Control Act of 1976 granted the EPA authority to require reporting, record-keeping, and restrictions of certain chemical substances or mixtures (Environmental, 2023). Sections of the act require chemical manufacturers and distributors to immediately inform the EPA of a chemical substance thought to present "substantial risk" to health or environment (Environmental, 2023). However, without knowledge of hazards, companies are legally allowed to use and manufacture chemicals without ensuring safety prior to public release (Lerner, 2020). Lerner states, "In America, killer chemicals are essentially

innocent until proven guilty," giving the EPA little power since the regulators depended on manufacturers like DuPont for data on chemicals it wishes to regulate (Lerner, 2020). These regulations, or lack thereof, granted DuPont the authority to set PFOA safety regulations as a part of forming the actor network. Although DuPont's original limit for the presence of PFOA in drinking water was 1 part per billion (ppb), the limit changed to 14 ppb when legal trials began shortly before it was raised to 150 ppb where it remained until 2006 (Lerner, 2020). By failing to inform the EPA and changing limits and regulations to meet production goals, DuPont continued to build the actor network.

Although it may seem clear the EPA is not liable because DuPont never disclosed the hazards, DuPont attorney's argued that the EPA already had information from 3M about the link between PFOA and birth defects in rats, thus additional studies were only confirmatory and did not need to be reported (Lerner, 2019). With knowledge of this earlier study completed by 3M, some may argue the EPA was liable for foreseeability. While this may be true, the EPA still fails to meet a different criteria of responsibility: freedom. The Toxic Substances Control Act, drafted in part by DuPont, was enacted after PFOA usage had already begun and thus the chemical was grandfathered in, meaning no regulation from the EPA was necessary unless manufacturers believed there was "substantial risk" (Shapira & Zingales). Since the standalone 3M study did not qualify as "substantial risk," the EPA was unable to regulate the chemical and additional studies were required for EPA action. Because DuPont did not inform the EPA of its studies of toxicity of PFOA, the EPA was unable to regulate the chemical, and the decision to act was removed from its power. In this case, the EPA failed to complete all the criteria for responsibility until knowledge was obtained and regulatory power over PFOA granted. Through the control of

information, regulatory bodies were essentially recruited to DuPont's continued production of Teflon and the continued PFOA contamination.

DuPont left both the EPA and local community in ignorance of the risks posed by Teflon production. Because the local community was financially dependent on DuPont, there was no incentive to find issues or wrongdoings of the company. Several regulators in West Virginia's Department of Environmental Protection (DEP) were loyal to DuPont, who was one of the state's biggest employers (Lerner, 2020). The director of West Virginia's DEP was found to have sent a document in 1996 "to aid DuPont in diffusing any potential enforcement action," making it clear the department would help defend DuPont (Lerner, 2020). Several people that originally worked for the DEP handling PFOA complaints later worked for the law firm that defended PFOA for DuPont (Lerner, 2020). The DEP's loyalty to and defense of DuPont further displays the network of actors working towards continued Teflon production despite associated hazards. DuPont was not only the largest employer in the area, but the company also invested in the town's athletic and art programs, which increased community trust and opened opportunities for deception (Johnson, 2021). DuPont has been in the area for over 70 years and was known as "the place to work in the Mid-Ohio Valley for a lot of years" (Sisk, 2021). DuPont was a tremendous employer, and some members of the community have stated the lack of talking about PFOA and health issues prior to legal action in the early 2000s was a matter of "not wanting to bite the hand that fed you" and another mentioned growing up "with fear of DuPont leaving town" (Sisk, 2021). In other words, the town was so reliant on the jobs and business DuPont brought to the area that they were willing to overlook something that was obviously wrong in hindsight and supported the company despite possible pollution.

In addition to using a position of power to avoid scrutiny, DuPont also lied to employees working on the Teflon lines about the effects of PFOA for decades. At one point, women were removed from the teflon line after two of seven previously pregnant employees gave birth to children with birth defects, but were never told why (Lerner, 2019). DuPont also lied about disposal since its own documentation specified PFOA was not to be disposed of in surface waters, yet did so for decades leading to high levels of PFOA in local drinking water (Sisk, 2021). Although a lack of community awareness and supervision may be counted as a casual contribution to the pollution, a lack of knowledge and foreseeability acquits the community from responsibility based on aforementioned criteria. DuPont abused the trust of the community by lying to them about the risks of the chemical as well as its disposal, but the company knew there was little risk of its corruption being exposed since the area relied heavily on DuPont income. In this way, DuPont was able to recruit the community towards its goal of continued Teflon production without PFOA mitigation. Having created a network of ignorant and powerless regulators, a trusting community, and a product making DuPont billions of dollars, DuPont had successfully recruited necessary actors for continued Teflon production and should be held responsible for the harmful effects that followed.

DuPont's Accountability Based on Criteria of Responsibility

Wrongdoing

Evidently, DuPont was proven to have committed various wrongdoings in both a legality and morality standpoint, which contributed to its responsibility for the outcome. One stark example of going against both moral and legal laws happened after DuPont's company lab found PFOA exposure was linked to enlarged livers in rats and rabbits in 1961 (Kelly, 2016). Upon learning of the effects of exposure on animals, DuPont scientists conducted tests on human

employees by asking a group of volunteers to smoke cigarettes laced with PFOA (Kelly, 2016). DuPont laboratory researchers said "Nine out of ten people in the highest-dosed group were noticeably ill for an average of nine hours with flu-like symptoms that included chills, backache, fever, and coughing" (Kelly, 2016). This study shows how DuPont's unethical human testing led to concrete awareness of the health hazards, yet it still did not inform the EPA, public, or lower level employees who could be working on the teflon line. Withholding knowledge from regulators for decades after evidence of the chemical's toxicity was legally wrong, and lying to employees about the hazards broke moral codes as well. Testing a chemical suspected to be toxic on humans without explaining the risks directly opposes ethical duties of human subject research. Dupont's wrongdoings are evident in the violation of legal and moral norms, which completes the first criteria of responsibility.

Casual Contribution

DuPont also portrays the second criteria of moral responsibility through its contribution to the contamination. In 1984, DuPont began secretly collecting local tap water and discovered PFOA at dangerous levels in the public drinking water supplies (Kelly, 2016). After discussing these results, executives decided methods for cutting pollution were not "economically attractive" and decided to not only continue production, but to escalate it (Kelly, 2016). High levels of PFOA in water was likely a result of poor disposal methods. By the 1970s, DuPont relied on disposal in unlined landfills and ponds and pouring waste water directly into the Ohio River (Lerner, 2019). Having evidence its disposal methods were harmful to local drinking water and the environment, DuPont continued still and it is estimated that between 1951 and 2003 the Parkersburg plant alone spread nearly 2.5 million pounds of PFOA into the environment and community (Lerner, 2019). The poor disposal techniques and escalated production contributed

greatly to the contamination issues. Since DuPont took no action to prevent the pollution and instead continued to utilize and improperly dispose of the toxic chemical, DuPont can be held liable for contribution to the disaster.

Foreseeability

Not only did DuPont commit wrongful acts, but the company knew about the consequences of its actions. A 1978 study revealed PFOA accumulated in employees' blood and studies in 1979 proved small amounts of PFOA to be lethal to dogs and monkeys (Lerner, 2019). Multiple studies from both DuPont's internal testing lab as well as results from 3M, the company that originally sold DuPont PFOA, showed statistically significant health effects from exposure as well as accumulation in blood and waterways (Lerner, 2019). Along with knowing of the health and environmental damage the chemical caused, DuPont also had knowledge of how this information would be viewed. Notes from a meeting following evidence of PFOA in drinking water state that "legal and medical will likely take the position of total elimination" (Kelly, 2016). This indicated DuPont knew the correct thing to do from a legal and medical standpoint, yet decided to continue with full knowledge of consequences and recommendations. DuPont had foreseeability of the potential harm and foreseeability of what legal and medical experts would have done, yet they kept information secret and continued despite the possible consequences.

Freedom

The final condition for moral responsibility is freedom to act. At many junctures in the decades preceding legal action, DuPont was faced with a decision to continue Teflon production as normal or to alter the process. An additional decision to be made each time an incriminating study was completed was how the information should either be shared or controlled. Meeting notes reflect DuPont freely made the decision to continue production and to conceal information

about the dangers of the chemical at each juncture from knowledge of the hazards in the 1950s until legal actions were taken in the early 21st century.

As I have argued, DuPont faced a choice that would determine the future outcome, and this choice makes the company liable under the final criteria of responsibility. Some might argue these choices were not free and were due to financial pressures from the billion dollar Teflon business. However, this is not entirely true when analyzing the meeting notes that contained other options beyond complete stoppage of production. One option presented in the meeting in 1984 was investing in incineration techniques that would have mitigated damages (Shapira & Zingales). A simple cost benefit analysis suggests the cost of preventing pollution was lower than the cost of health damages produced, thus mitigation of such a hazard could be seen as financially favorable when risks were considered. Additionally, DuPont's medical director and vice president at the time of this decision was even quoted saying "it is not only a matter of the duty or corporate ethics to report pertinent health information…To do less would be both morally irresponsible and in many cases economically irresponsible…"(Shapira & Zingales). One of the leaders of DuPont made it clear that sharing information was the responsible thing to do. The exact wording from the 1984 meeting notes state "from a broader corporate viewpoint, the costs are small" (Schmid, 1984). This proves financial resources were available and the investment minimal in a holistic corporate viewpoint. Despite knowing actions were financially reasonable, DuPont freely chose to accelerate production, completing the final criteria for responsibility.

Conclusion

Although it may seem clear based on legal decisions that DuPont was responsible for PFOA contamination, it is important to analyze the case through the lens of actor network theory and criteria of responsibility to clearly illustrate which actors were responsible and how DuPont

was able to form a network that allowed it. Using criteria of responsibility, DuPont is to be held accountable for its wrongful actions in which it had both knowledge and freedom of action.

Corporations and chemical manufacturing companies should be held accountable for the safety and well being of customers, employees, and the broader community served. By considering the network a company is operating in and criteria of responsibility, it can become easier to understand responsibility for actions and specific outcomes. This understanding is vital so actors can be cognizant of the reasonings for blameworthiness, and furthermore be accurately held accountable. Companies should be better able to judge when and how to act by adhering to both legal and moral law as knowledge of hazards develops in order to create a safer and better world.

Word Count: 3735

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