

**Environmental Pollution as an Impetus of Change: A Case Study on Cancer Alley,  
Louisiana**

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On my honor as a University Student, I have neither given nor received unauthorized aid on this  
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## **Introduction**

According to Lall et al. (2020), ninety-nine percent of all liquid freshwater is stored beneath the surface of the Earth. This groundwater supplies nearly half of all drinking water across the globe, forty percent of water used for irrigation, and a third of industrial water. Lall and colleagues describe how contamination of this precious resource “has become endemic as human activities intersect with water flow pathways” (p. 172). Contaminants are often anthropogenic: agrochemicals, chlorinated solvents, pharmaceuticals, and human fecal pathogens, but natural contaminants such as, arsenic, saline, and lead also pose threats.

When a groundwater aquifer becomes contaminated, it can cost millions of dollars to treat and supply reusable water. Based on a study conducted by DeSimone et al. (2015) more than 20% of the 6,600 public and domestic wells sampled in the United States contained at least one chemical at a concentration greater than a Maximum Contaminant Level (MCL) set by the U.S. Environmental Protection Agency (USEPA). However, the authors ominously note that “concentrations of manmade chemicals...exceeded human-health benchmarks two to four times more frequently in shallow groundwater beneath agricultural and urban land than in groundwater from the deeper parts of aquifers currently used for drinking water” (Desimone et al., 2015, p. 3). And that the downward migration of this water will have drastic consequences on the supply from deeper aquifers. Not only does the contamination of shallow aquifers pose a threat to future generations, but it also has tangible, short-term human health concerns. In areas with shallow aquifers as their primary drinking water source, when polluted via agricultural practices, studies have shown that children and infants are at especially high-risk compared to adults for negative health outcomes (Wu & Sun, 2015).

Sometimes, groundwater contamination can originate from point sources that release high concentrations of organic chemicals, heavy metals, or radioactive isotopes that present incredibly significant and immediate health effects to the local population. These cases are managed by the Superfund program, established by the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA). Managed by the USEPA, this program is designed to provide emergency response, site analysis, and remediation for toxic waste dumps, as well as hold responsible parties liable (Office of Land and Emergency Management [OLEM], 2018). Overall, the program has been wildly successful in its effort to remediate and restore contaminated places. However, throughout the US, there are numerous sites within the Superfund program that have remained open for decades without further action, this thesis investigates the interplay between impacted individuals, local government, and the USEPA to understand the impacts these relationships have on the cessation of remedial action.

### **Actor Network Theory and Pollution**

Actor-network theory (ANT), is an STS framework, developed by Bruno Latour and Michel Callon, for analyzing the network between human and non-human actors (Latour, 1992). This theory targets the mechanisms of network formation and stabilization. These networks are ever changing and non-rigid in nature, developing through the relationships and interactions of numerous actors, both human and non-human. A critical concept of this framework is that technology shapes humans and that social structures impose influence on the development of technology in society. This *symmetry* across the human/non-human divide is the thesis of ANT. Additionally, Latour posits that there is a “flat ontology” in which all actors have equal influence on the outcome of a given scenario, both human and machine. By their very nature, networks are

heterogeneous, as such, actors have varying interests, motivations, and goals which can lead to conflict.

Power dynamics play a critical role in these networks. When analyzing a network, it is important to consider how the set of values inscribed within an actor. This information can help inform the actions of said actor. When considering this inscription, it is paramount to consider how these values may prescribe constraint, action, or conditions upon another actor. Consider the CAA: inscribed within this law, both explicitly and inexplicitly, are the values of the citizens' right to be free from polluted air and states' rights. In certain cases, as will be discussed, the latter supersedes the former and state autonomy is placed in higher regard to the health and well-being of citizens. As such, this law does prescribe a *minimum* set of standards that states must abide by, whilst delegating the enforcement of these standards to the states themselves. Because of this entrustment, the regulations vary wildly from state to state, some relatively stringent, some unchanged. Moving down the proverbial food-chain, what values inscribed within a state's government affect the management and enforcement of the CAA? How do the values of communities within a state prescribe action from the state government?

### **A Brief History of 20<sup>th</sup> Century United States Environmental Regulation**

The story of the US Environmental Protection Agency (USEPA) is long and fraught. Beginning in the late 1950s, public concern for the health of the environment began to blossom into a movement. As the threat of air pollution loomed over American cities and industrial runoff clogged waterways, the people demanded government action. In response, several pieces of legislation were passed, most notably the Clean Air Act of 1963, the Clean Water Act of 1965, and the Motor Vehicle Pollution Control Act of 1965. Combined, these laws enabled the federal

government to regulate sources of air pollution, set water quality standards, and set emission standards for personal vehicles. The 20<sup>th</sup> century environmental movement, catalyzed by Rachel Carson's work, *Silent Spring*, began to burn bright in the sixties and two environmental disasters in 1969 only added fuel to the fire. First, in late January, an oil well in Santa Barbara poured over 200,000 gallons of oil into the Pacific Ocean for 11 days, causing devastation up and down the coast of California. Five months later, Ohio's Cuyahoga River burst into flames over fifty feet high (Public Broadcasting Service, n.d.). The movement resulted in the first Earth Day on April 22<sup>nd</sup>, 1970, promoting environmental awareness and justice, and the Nixon administration creating the EPA later that year.

The genesis of the Superfund program, alongside CERCLA, was driven by a series of dramatic events surrounding several toxic waste sites. The most notable of which being Love Canal. In 1942, Hooker Chemical Co. began dumping hazardous chemical byproducts into the abandoned Love Canal of Niagara Falls, New York. By the end of their tirade, Hooker had cast aside approximately 20,000 tons of chemicals into the old canal, shortly thereafter, the company sold the property to the local school board for a downright bargain of \$1 and rid itself of liability. On August 7<sup>th</sup>, 1978, following a marked increase in cancer rates in Niagara Falls, New York, President Carter declares a federal health emergency, enabling emergency funds for the relocation of more than eight hundred families and initial cleanup measures (OLEM, 2018). Within two years, CERCLA was passed and along with it, the Superfund program. Unfortunately for Hooker Chemical Co., now Occidental Chemical Corp., CERCLA allowed for retroactive liability which held the company responsible for the cost of waste cleanup (Glass, 2014).

Love canal is a glaring reminder of the disastrous consequences of the negligence of corporations. Over the years many sites have been added to the Superfund program, some of

these sites have been remediated and subsequently deleted from the Superfund program, some, however, sit idle awaiting promised remediation that has yet to manifest. The program itself is inherently political, the success and timeliness of the cleanup for these sites is heavily dependent on federal funding. This can lead to stalls, as under the Trump administration (Knickmeyer et al., 2020) and expedition, via \$1 billion in funding under the Biden administration (Daly, 2023). Such is the case for several sites in Portsmouth, Virginia and an abandoned Cotter uranium mill in Cañon City, Colorado. Of the five sites in Portsmouth, all of them have been a part of the Superfund for at least 10 years, one has been since the founding of the program (Brown, 2022). The Cotter uranium mill has been a Superfund site for the past 39 years and as of now there is no plan of further action (Schmelzer, 2022).

CERCLA is not alone in its lack of proper funding and enforcement. The Clean Air Act (CAA) leaves enforcement of air pollution regulation standards up to the states. One state in particular, Louisiana, has consistently been ranked in the bottom quarter of states in enforcing the CAA. The avoidance of enforcement can often be chalked up to the state's industrial interests (Castellón, 2021). Having some of the highest concentrations of oil and gas resources in the United States and direct access to a large port city, makes Louisiana an attractive site for petrochemical manufacturers, especially along the Mississippi River. Subsequently, the state welcomes the industry, eyeing the economic benefits. This hospitality has resulted in a single stretch of the Mississippi, teeming with over two hundred petrochemical plants.

Civil rights leader Reverend Dr. William J. Barber II best summarizes the situation, “the same land that held people captive through slavery is now holding people captive through this environmental injustice and devastation” (Juhasz, 2019). Cancer Alley is the aforementioned region that lies between Baton Rouge and New Orleans, along the Mississippi River. Living here

nets an individual a cancer risk that is greater than one and a half times the national average, earning the place its nickname. This risk is higher for low-income communities compared to more affluent ones and even higher for Black communities (seven to twenty-one times greater) compared to white ones, according to multiple studies. (James et al., 2012; Terrell & Julien, 2023). Residents blame the two hundred plus petrochemical plants that line the river, representing a quarter of US chemical manufacturing (Nagra et al., 2021). Currently, there are twenty-four plants proposed or under construction within the parishes that Cancer Alley weaves through, threatening even more pollution for these communities (Deep South Center for Environmental Justice, 2023).

## **Research Methods**

How is the enforcement of pollution control affected by the power dynamics between pollution emitters, impacted communities, as well as local, state, and federal governments? The importance of this question is characterized by the health of individuals. Highlighting the issues at play may give rise to swifter discourse and action surrounding these sites and prevent further negative health outcomes for individuals. In answering this question, I hope to provide nuance to the complex scenarios surrounding these tragic situations.

To answer the question, I will conduct case studies of two citizen-corporation disputes within the region of Louisiana known as “Cancer Alley.” The case study centers around the proposed Formosa Plastics Corporation plant in St. James Parish. To gather information, I will be researching the citizen’s experience in the form of new articles and reports by advocacy groups, the response of local and state officials and regulatory agencies, the EPA's interactions

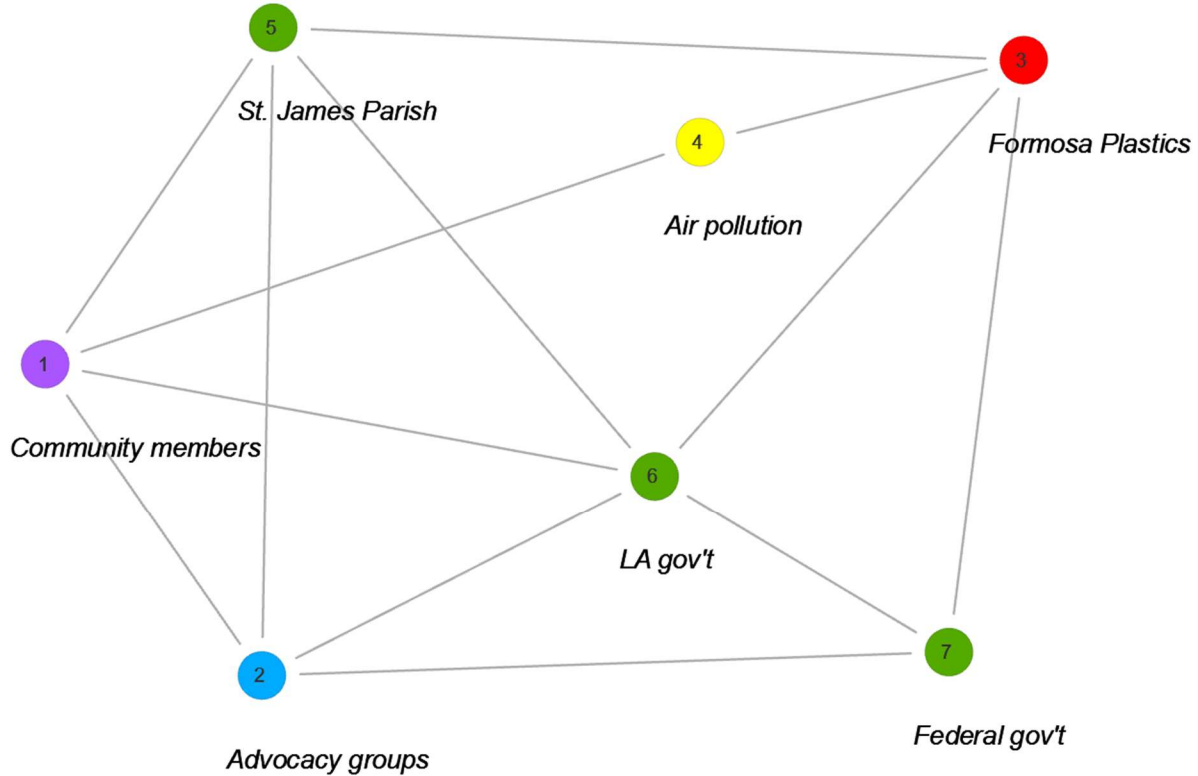
and formalized plans for these areas, and scientific research conducted on the area. Through this research I expect to find imbalances of power that continuously enable injustice.

The purpose of this analysis is to answer smaller questions revolving around the larger one: How does a citizen's background and circumstance affect their chance of being impacted by a human-induced environmental emergency? How much discrepancy was there between the time of discovery and time of response? How did emergency response vary amongst the sites? What was the response of local government? And, why did these areas experience such crises, was it negligence? Or do factors such as income or race play a role? In answering these questions, I aim to build a network of significant actors and by doing so, understand the cause-and-effect relationships influencing the timeliness of remediation.

### **The People of St. James Parish vs. Formosa Plastics**

The story of Cancer Alley is that of institutional racism, government negligence, and corporate greed. Beyond these facts, is a complex network of actors, depicted in Figure 1, a subset of which work to maintain the status quo via the exertion of power. These actors, Formosa Plastics, St. James Parish, and the Louisiana state government, apply their power in a multitude of ways. The most common is local legislative action, this is closely followed by contravening federal legislation. On top of this is a blatant disregard of scientific research as well as the concerns of fellow citizens. Armed with these tools, they attempt to prescribe compliance to the community of St. James Parish but find that this community is not so willing. Through this case study I uncover how the air pollution itself facilitates action within the community and the power of grassroots activism.





**Figure 1.** A network diagram of key actors surrounding Formosa Plastics and St. James Parish. Each connection represents a direct interaction between a pair of actors.

The preparation for more the construction of more factories was largely induced by a 2014 zoning change within St. James Parish. Part of the rezoning plan was to re-categorize the 4<sup>th</sup> and 5<sup>th</sup> districts of the parish to “Residential / Future Industrial.” Essentially deeming former community spaces as fit for the construction of industrial plants. According to a 2020 report by the advocacy group Louisiana Bucket Brigade (LBB), the rezoning plan was deceptive, and failed to communicate critical information to residents. Via public records requests, the authors found “nothing...that shows how the decision was made to de-map longstanding residential communities.” Additionally, the rezoning plan fails to denote African American schools, businesses, and churches within a “buffer zone” map which leaves these community spaces

outside of the 2-mile buffer of industrial-free zoning. The report also found that the Parish is much more willing to protect majority-white districts from industrial rezoning (LBB, 2019). These findings lead to questions about the underlying motivations of the Parish government.

On April 23, 2018, Formosa Plastics and former Louisiana Governor, John Edwards, announced the “Sunshine Project,” plans for a \$9.4 billion chemical manufacturing plant in St. James Parish. The announcement promised the creation of over 9,000 jobs for the surrounding area, in exchange the state offered a \$12 million grant (distributed over four years, beginning in 2021) for construction (Louisiana Economic Development, 2018). According to the Sunshine Project’s website, the parish offered \$1.5 billion in incentives for Formosa to build their plant (Formosa Group, n.d.). However, “the complex would emit into the air hundreds to thousands of tons per year of volatile organic compounds, particulates and nitrogen oxides” as well as lesser amounts of formaldehyde, toluene, and benzene (Mitchell, 2018). The former Parish President, Timmy Roussel believed that bringing in Formosa would bring “unheard of opportunities” to the community. Before the company could proceed, public hearings needed to be held by the Parish Council and Planning Commission due to residents’ concerns about the construction of yet another chemical manufacturing facility. Despite opposition from community members and environmental activists, the commission voted to approve the plans, seven to two.

Sharon Lavigne, a resident of Welcome, witnessed what was occurring within her community and she demanded justice. The October following the announcement of the Sunshine Project, shortly after the Parish approved the plans, Lavigne founded RISE St. James, a faith-based organization whose goal is to fight for environmental justice and “defeat the proliferation of petrochemical industries in St. James Parish” (RISE St. James, n.d.). The timing could not be more fortunate for the people of the Parish, nor more devastating to the goals of Formosa and the

Louisiana government. The permit hearing was held on December 6<sup>th</sup> in Vacherie, an unincorporated community within the parish. The US Army Corps of Engineers (USACE), the Louisiana Department of Environmental Quality (DEQ), and the Louisiana Department of Natural Resources (DNR) were holding it to decide whether to grant the Formosa Plastic Sunshine Project wetlands usage permits and water quality certification. Testimony after testimony, RISE St. James alongside community members and advocacy groups, such as 350 New Orleans and the Gulf Restoration Network, from across the state decried the proposed chemical plant, raising numerous concerns: environmental racism, increased pollution, the request of an environmental impact statement, and a plea to end suffering (Dermansky, 2018). Despite overwhelming opposition from the community, the St. James Parish Council approved the Formosa plans.

Supporting the coalition against Formosa is the company's historical non-compliance with environmental regulation. In 2009, Formosa had to cough up over \$10 million for pollution control measures alongside \$2.8 million in fines due to violations under the Clean Air Act (CAA), Clean Water Act (CWA), Resource Conservation and Recovery Act (RCRA) and Emergency Planning and Community Right-to-Know Act (EPCRA) (Office of Public Affairs, 2014). Then, in 2016, a Formosa steel plant in Vietnam a toxic spill contaminated over 125 miles of coastline and killed hundreds of tons of fish (Yu & Hung, 2016). All of this illustrates what St. James Parish and the Louisiana state government value: economic growth. These institutions assert power over the community by dismissing their reasonable concerns and overriding any power the community members might hold.

Five months after the permit hearings, in May of 2019, demonstrators began a five-day march from Reserve, Louisiana to the state capitol building in Baton Rouge. Organized by

Lavigne and RISE St. James, the march, entitled the “Coalition Against Death Alley,” demands the compensation of healthcare costs due to toxic pollution, the prohibition of industrial facilities within five miles of public spaces, and an end to Louisiana’s pro-industry tax incentives (Lartey & Laughland, 2019). Other environmental groups joined them, including the Sierra Club, 350 New Orleans, and Extinction Rebellion. Later that year, Lavigne penned a letter to the St. James Parish Council requesting a moratorium on all “new land use applications for all new petrochemical facilities and infrastructure including pipelines” (RISE St. James, 2019). Within the power structure, Lavigne alone cannot take action against Formosa and the state, but with the support of numerous advocacy groups she can.

Despite a Texas judge deeming Formosa a “serial offender” and holding them liable for past illegal discharges of plastic pellets into bays and wetlands along the Gulf of Mexico, three months prior, the USACE authorized Clean Water Act permits for the corporation on September 10<sup>th</sup>, 2019 (Center for Biological Diversity [CBD], 2019). Ironically, and sadly, just five months later, a Texas judge found Formosa responsible for yet another environmental disaster, ordering a \$50 million settlement (Collier, 2019).

Fifteen days into the new year, the CBD, Healthy Gulf, the Louisiana Bucket Brigade, and RISE St. James sued the Trump administration for permitting the development of Formosa plastics new petrochemical complex (*CBD v. USACE*, 2020). The suit alleges a “failure to disclose the environmental damage and public health risks,” a failure to consider culturally significant areas such as the slave burial ground on the site, and the environmental concerns of air pollution and plastics production. Brushing up against the November 5<sup>th</sup> deadline, the USACE announced, in a motion to stay summary judgement, on November 4<sup>th</sup>, 2020, that the previously awarded permits for Formosa’s petrochemical complex were to be rescinded,

effectively blocking construction. This day was a huge victory for the communities in St. James Parish and RISE St. James. In August 2021, the USACE ordered an environmental impact statement of Formosa's complex (Volcovici, 2021). The following year, Earthjustice, a non-profit environmental law firm, filed a complaint to the USEPA on behalf of the Concerned Citizens of St. John (CCSJ) and the Sierra Club, alleging violations of Title VI of the Civil Rights Act of 1964 (Earth Justice, 2022). In April, the USEPA opened an investigation into this complaint and six months later released a letter stating that there is "significant evidence suggesting that the Departments' [LDEQ] actions or inactions have resulted and continue to result in disparate adverse impacts on Black residents of St. John the Baptist Parish, St. James Parish, and the Industrial Corridor" (USEPA, 2022). A month prior to the EPA letter, Judge White of the 19<sup>th</sup> Louisiana Judicial District Court revoked the air permits granted to Formosa by LDEQ on the grounds of errors made by LDEQ that "prejudice substantial rights...of the Petitioners" (*RISE St. James v. LDEQ*, 2024). Victory after victory for the communities within Cancer Alley, hope was brewing, Lavigne commented after the ruling, "I think this is the beginning of a change" (Bruggers, 2022).

Sensing a change in the winds, Inclusive Louisiana, Mount Triumph Baptist Church, and RISE St. James sued St. James Parish, its Council, and Planning Commission in March of 2023 (*Inclusive Louisiana v. St. James Parish*, 2023). The suit accuses the parish of utilizing land-use policies that specifically target African Americans in a harmful manner. Unfortunately, the case was thrown out in November on procedural grounds, for being several years too late (Associated Press, 2023). This was just after the EPA pulled out of its investigation of the LDEQ having not made any findings (Juhasz, 2023; USEPA, 2023). Lavigne's cause suffered further when on

January 1<sup>st</sup>, 2024, an appellate court overturned the prior decision revoking Formosa's air permits affirming LDEQ's decision (*RISE St. James v. LDEQ*, 2024).

It seems the fight for the protection of the health of residents in Cancer Alley will continue yet hope remains. On January 25<sup>th</sup>, 2024, the Human Rights Watch published a report entitled "‘We're Dying Here': The Fight for Life in a Louisiana Fossil Fuel Sacrifice Zone." The report extensively highlights the adverse health effects of the pollution from petrochemical manufacturers in Cancer Alley (Human Rights Watch, 2024). The same day, Amnesty International published its own report, "The Cost of Doing Business? The Petrochemical Industry's Toxic Pollution in the USA," that touches on similar issues (Amnesty International, 2024).

## **Discussion**

Sharon Lavigne and RISE St. James have faced many obstacles. At every turn, they were subjugated to the whims of their local and state governments which seem to be in the pocket of Formosa Plastics. Even faced with an insurmountable challenge, they exercised their right of free speech and demanded for more stringent air quality standards, the proper enforcement of these standards, and that no more plants would be built within their community. The federal government, through the USACE, holds power over Formosa Group and St. James Parish as the arbiters of certain environmental permits. By approving the permit applications, they grant their power to the company, inciting the subsequent court cases.

The actor-network within Cancer Alley is large and complex, because of this I could only touch on a single facet of the numerous injustices that have occurred within, that facet being the events surrounding the Formosa Plastic Group's project proposal within St. James Parish. In

gathering the immense amount of information, I have concluded that the most powerful tool for change is strong, community-centered leadership. When analyzing this problem, an interesting aspect of Actor-Network Theory (ANT) arises, that of translation, a process allowing a given network to become represented by a given entity. In the case of Cancer Alley, specifically the community's fight against Formosa Plastics, the translation occurred for Sharon Lavigne wherein she saw the problem and decided to act. Pollution, as an actor, directed Lavigne to rally her community and push back against the local parish government, the LDEQ, and ultimately the polluters themselves.

One limitation of this research is time, the sheer volume of information on this subject would take at least a year to wade through, possibly more. Because of this my analysis is limited and likely missed some perspectives and actors within the system. Additionally, perhaps this is a lack of understanding on my part, ANT seems to provide a framework to look at systems in a new light but is perhaps not best in terms of bigger systems where technology is certainly present (facilitating communication, transportation, enabling community discourse, etc.), yet holds a less critical role.

On April 9<sup>th</sup>, 2024, the EPA passed a new rule regulating the emissions of ethylene oxide, chloroprene and other hazardous chemicals. This regulation will reduce emissions and enforce fence line monitoring programs on 218 facilities across the country, over half of which are located within Texas and Louisiana (Daly, 2024). With the recency of this rule, we have yet to see what kind of impact it will have on communities like St. James, though it is certainly a stride in the right direction.

## Conclusion

To conclude, when all else fails, grassroots advocacy for just causes can lead to amazing victories for a community. If the people claiming to represent you will not speak on behalf of your interests and values, the only voice left is your own. By ignoring the desires of the community, St. James Parish effectively seal its fate by setting itself up for a lengthy legal battle that, even if won, would be costly. Using ANT as a lens for this problem helps to illustrate how air pollution prescribes community action. Because regulations were not being properly enforced and the state's dismissal of the idea of increased cancer risk, the people of St. James Parish were forced to fight for the change themselves. Moving forward, it is imperative that the federal government steps in to implement real change for these communities. In an ideal world, reparations would be paid to each family who has suffered the consequences of neglectful leaders, but for now, each step taken to improve the air quality in Cancer Alley improves the lives of many.

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