SEEING ASBESTOS IN THE LUNGS OF THE LABORERS:
BUILDING A REGIONAL RESPONSE TO ASBESTOS DISEASE

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The history of asbestos disease in the shipyards of the Puget Sound region, from early instances of exposure in the 1930s to the action by medical doctors to address the disease in the 1970s, shows that the movement towards occupational health was a unique part of the environmental movement. Based on court depositions, public health documents, and union records from archival research at regional institutions including the Puget Sound Regional Archives, the King County Records and Archives, and the University of Washington, this study reveals how the response of consumer groups, doctors and workers to asbestos disease in the 1970s was itself a part of the environmental movement.

While health experts knew about the dangers of asbestos in the 1930s, corporations failed to protect those working in the shipyards. Only in the 1970s did the workers finally achieve protection. Then, spurred on by pressure from consumer groups, and utilizing Nixon-era federal programs and dollars reserved for protecting the environment and fighting cancer, a group of environmentally-minded medical professionals, policy makers, and workers successfully built awareness, developed a system to provide treatment for afflicted workers, and began the pursuit of environmental justice for laborers with asbestos diseases. This movement, led by a group of occupational medicine doctors and public health officials, successfully transformed the medical and work landscape of the Puget Sound region into one that emphasized occupational healthcare, provided medical assistance, and ensured safer working environments.

In engaging scholars in the field of environmental history, the project shows an overlooked connection between occupational health and the environmental movement. In the

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1 Cover source: Photographs and other Graphic Materials from the Department of the Navy. Thirteenth Naval District, Puget Sound Naval Shipyard. (ca. 1924 - 09/18/1947) NARA’s Pacific Alaska Region, Seattle WA, Records Group 181.
Puget Sound region, responses to asbestos disease culminated in a new occupational healthcare system that focused on work environments as the key cause of industrial disease.

This project leaves many questions unanswered. While I initially set out to investigate the cultural, ethnic, and social backgrounds to asbestos disease, I found that the sources limited my work to a study of the responses to the disease rather than a lengthier history about the cultures of asbestos exposure. In addition, I recognize that the regional nature of my approach limits the scope of my research and thus the actors involved in the story. However, the study is the result of a wide range of resources that were consulted in the Puget Sound region, and reveals a small piece of the asbestos story.
Acknowledgements

For this thesis, I wish to thank Dr. Jeff Sanders, who has mentored me as a young historian throughout the last two years, and has been a constant encouragement despite my sometimes-slow progress on the project. In addition, I wish to thank Dr. William Budd, who made a comment one day in his Environmental Policy class that eventually became a basic seed for my paper—human health makes environment important. Connor M. Casey and the staff at the University of Washington Special Collections provided excellent assistance, as did Phil Stairs at the Puget Sound Regional Archives, and Rebecca Pixler at the King County Archives. The members of the Friday volunteer crew at the PSNS museum in Bremerton, and especially Randy Tacey, were incredibly helpful during my visit there. Finally, I would like to thank my mother Erin for her help on reading drafts, Emily Martin for constantly listening to my changing perspective on my sources, and my family and the legions of friends who have supported me throughout not only this project, but throughout my entire academic career.
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**Introduction: the roots of occupational environments**

Just an hour’s ferry crossing from the bustle of downtown Seattle, in Bremerton, Washington, the dominant feature of the town is the shipyard adjacent to the ferry terminal. To the west, cranes, sheds, and grey hulls of naval ships dominate the view as far as the eye can see. On the nearest shed, a sign announces to those arriving by sea, “Puget Sound Naval Shipyard: Building on a Proud Tradition.” In the 1940s, six boats travelled the route bringing workers to and from the shipyards, carrying laborers like Ralph Vernon David across the water. Shipyard insulators, workers like Ralph David or Monte Anderson, installed asbestos on the naval ships of World War II and the Cold War, thus providing fireproofing for the nation’s fleet. However, their labor was not without cost. For workers like David and Anderson, life in the shipyards was a death sentence. On July 30th 1985, Anderson, was diagnosed with mesothelioma at the University of Washington Occupational Medicine Clinic. While he tried to remain positive, he would live out the few remaining years of his life with lung pain and shortness of breath. In 1987, Anderson died, killed by cancer, a consequence of his working environment.

Beginning in the late nineteenth-century, thousands of workers around the world worked with asbestos in the shipbuilding industry. A mined mineral, asbestos is not a chemical toxin but, instead, is a naturally occurring one, provided by geologic processes in Quebec, South Africa, and Idaho. Government officials, corporate salesmen, and insulators praised asbestos for its unique and useful characteristics. Asbestos is not only fireproof but is also an effective insulator, easily added to all kinds of products to provide heat proofing. It is moldable for pre-fitted applications, can be added to cement, and supplied in cloth form to provide for unique

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uses. It was a necessary material, a true miracle of the modern world, one that if properly controlled, would provide immense benefit and little risk. Industrial engineers, naval engineers and urban designers thought asbestos was important for building not only safe naval vessels, but a safe post-war American landscape—one that could be impervious to the destructive fires of the past. Yet, asbestos was not nearly as perfect as advertised.

Asbestos is an insidious toxin, one that sneaks into the body through the air. If asbestos remains sealed and intact, it is harmless. When asbestos is disturbed, tiny fibrous particles break off from the larger pieces. The fibers are small enough to be inhaled by humans, yet too large to leave the lungs again for some time. The rate at which the lungs clear the fibers after exposure is still unknown, partially because various types of fibers stay in the lungs for different lengths of time.

However, the equation for disease is simple. Longer exposure to more fibers equals greater correlation to disease, primarily asbestosis, mesothelioma, and other cancers. Workers who installed

Figure 1 The downtown Bremerton side of Puget Sound Naval Shipyard in the 1940s. Source: Photographs and other Graphic Materials from the Department of the Navy. Thirteenth Naval District. Puget Sound Naval Shipyard. (ca. 1924 - 09/18/1947) NARA’s Pacific Alaska Region, Seattle WA, Records Group 181.

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4 Thus signs across American college campuses on permanently closed doors read “Asbestos Hazard: Do not Open.”
6 Asbestosis is the most common of the diseases that asbestos fibers cause when they enter the lungs. Airborne asbestos fibers are easily inhaled, yet, the small size that enables the fibers to enter the pleura of the lungs is not miniscule enough to allow their exit, resulting in “pulmonary fibrosis” whereby the pleura are clogged, hence limiting oxygen intake and lung function. In addition to breathing difficulties and chest pain, asbestosis causes the clubbing of fingers and toes, and an inability to perform simple physical tasks. The second most notorious of the asbestos diseases is mesothelioma which is much more rare and devastating. Mesothelioma is cancer of the

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and removed asbestos without adequate safety measures naturally disturbed the fibers. Asbestos entered the air, was inhaled, and infected workers. The result was one of the most costly environmental epidemics of the twentieth century.

Because of the economic costs asbestos litigation had on corporations and the US court system, it is almost impossible to view the substance today outside of a legal context—a fate that has also tainted histories of the substance. The legal history of asbestos, which involves a corporate-cover up and a major clogging of the legal system during the 1980s, has captivated historians as well.7 Historians, thus, have widely avoided discussions about asbestosis and mesothelioma from a worker or environmental perspective. Historian Peter Bartrip, in his book Beyond the Factory Gates: Asbestos and Health in Twentieth Century America, made a first attempt at writing a worker’s history of asbestos. However, as Bartrip writes in his introduction, the work “does not plug the gap” of describing how workers and health officials fought asbestos disease.8 Stories that connect workers to health are often ignored by historians, who tend to separate the health and labor into separate fields of study. While Bartrip discusses the movement toward protecting workers in the workplace, he does little to discuss local contexts or actions, and the focus is more on corporations than workers at local shipyards and doctors at local medical clinics.

In the last ten years, as environmental historians have begun to look at other industrial diseases, and have themselves finally reconnected environments and human health, they have generally left out in-depth discussions of asbestos. Yet, this story is needed. Like chemical toxins

mesothelium, or the layer of tissue that surrounds the muscle of the lungs. There is no recourse against the disease as of yet. Those afflicted with the disease experience ever increasing weakness from diagnosis until death.

8 Peter Bartrip, Beyond the Factory Gates: Asbestos and Health in Twentieth Century America (Continuum, 2006).
in the agricultural landscapes of Southern California that historian Linda Nash has studied, and silicosis in the coal mines of Colorado that historian Daniel Rosner has studied, asbestos in the shipyards of Puget Sound provides an opportunity for understanding how the reconnection of humans to the environment in the 1960s shaped local responses to environmental disease.

Doctors knew asbestos was dangerous, yet failed to protect workers effectively until the 1970s. They often lacked the resources and facilities to act on this knowledge. Only with federal funding of environmental health programs in the 1970s did change become a reality. As more recent works have shown, the environmental movement not only created new knowledge and approaches to environment, but contributed to a change in beliefs about how such knowledge ought to be used. Environmentalism brought about a shift in what we as a society deemed worth protecting. For example, in his work on the environmental movement, *Forcing the Spring*, Robert Gottlieb points out that in the 1970s people began to reconnect community environments with workplace environments, realizing that both needed to be safe.

Recent environmental justice-based critiques of the 1970s’ environmental movement have pointed out that mainstream environmentalism missed many aspects of environment, and consistently ignored class-based environmental issues. However, the story of asbestos disease

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9 In *Inescapable Ecologies*, Linda Nash refers to the environmental movement of the 1960s as a return to the idea that place, as opposed to germs, is the contributing factor to disease, an idea counter to the common paradigm held since germ theory was invented in the late nineteenth century. It was a period where scientists reconnected body-knowledge and environments. See Linda Nash, *Inescapable Ecologies: A History of Environment, Disease, and Knowledge*; University of California Press, 2006.

10 David Rosner and Gerald Markowitz, *Deadly Dust: Silicosis and the on-Going Struggle to Protect Workers’ Health* (University of Michigan Press, 2005); Robert Gottlieb, *Forcing the Spring: The Transformation of the American Environmental Movement* (Island Press, 2005); B. Walker, *Toxic Archipelago: A History of Industrial Disease in Japan* (University of Washington Press, 2010). Initially I had intended to include race and class in this study, as has been the trend in these literatures, which are often classified as environmental justice. However, this data was simply not available for asbestos in the Puget Sound region, as most data collected was only for white males in order to provide “accurate” statistics. Thus, much of the data on asbestos leaves out minority cases, which is troubling, and indicates the impacts of the epidemic might be even greater in the region if minority workers were included in the studies. See P Brown "Race, Class, and Environmental Health: A Review and Systematization of the Literature," *Environmental Research* 69, no. 1 (1995).

11 Gottlieb, 352.
offers an example of medical doctors after the 1960s striving to connect communities and workplace environments long before the communities themselves did. The change in asbestos safety, treatment, and education is unique because it grew out of the concerns that a select group of medical professionals and consumers action groups had for working-class shipyard employees.¹²

These new kinds of occupational doctors were eventually empowered by the federal government to establish systems of environmental health and medicine based in local hospitals and academic institutions, where they could provide accurate and helpful assessments to workers under union insurance outside the reach of corporations. The movement towards this system was not a separate environmental crusade, but rather an extension of the movement into the realm of medical doctors, who possessed X-Ray machines and CT-scanners to see the environmental damage where nobody else saw it—inside the lungs of workers. However, achieving these ends was a slow process, and the story of the transition from a society that placed little value on worker health, to one that actively funded efforts to expose worker disease through local institutions required the reconnection of environments and occupational thinking.

Despite knowledge of asbestos disease, society failed to provide protections for its workers because it failed to connect worker health to worker environments. With the environmental movement and the increased emphasis on human health in the 1960s, people began to reconnect worker health to shipyard environments. Yet, progress in addressing worker disease was slow, and only at the end of the 1970s did doctors, consumer agencies, and unions cooperate to effectively address infected workers.


In discussing the asbestos epidemic in Libby, Montana, Phaedra C Pezzullo, a director of public culture at Indiana University, discusses the failure of the environmental movement to address asbestos. According to Pezzullo, because asbestos is invisible, it would not have attracted traditional environmentalists.
The action to diagnose and educate workers was the result of medical knowledge coming to the forefront at the same time the population at large began to reconsider toxics. This helped inspire federal action, changing the regulatory framework of the work environment. In this atmosphere, consumer groups finally were able to pressure the federal government, forcing it cooperate with a new body of environmental doctors, the result of which was a new, occupational medicine infrastructure. Thus, occupational health was moved outside of the domain of corporations, and into the hands of clinics that equated environment with occupation. Building on federal legislation, the clinics ran local awareness campaigns, diagnosed workers, and provided access to a means of justice. As a result, environment is now a key part of workplace health.\textsuperscript{13}

**Breathing the Dust**

Workers like Monte Anderson and Ralph David, who labored at the shipyard during the middle years of the century, never connected the dust of their working environment to possible health effects in the future. Masks were a tool to achieve comfort rather than a tool to protect workers from health problems. However, manufacturing corporations and pulmonary doctors, who already had a historical and scientific understanding of asbestos’s role in causing disease, did not share their knowledge.

Scientists long knew about asbestosis—the most common of the asbestos diseases. Pliny the Elder commented on the danger of it in Roman times, and medical professionals knew the potential for workers to contract pulmonary fibrosis as early as 1930, when the first modern study of the disease was published in England.\textsuperscript{14} Nobody questioned that asbestos fibers could cause disease. Just as silicosis affected miners for centuries, doctors understood asbestos had a similar impact. Yet, in the shipyards of Puget Sound region, this scientific knowledge about asbestos’s impacts was not applied in any meaningful way. In fact, at PSNS, though the Navy knew the dangers of asbestos and actively involved itself in studying workers, it never passed its concerns about asbestos onto the workers using it in the yards. The Navy’s concern is evidenced by its studies in the 1940s, which it began in hopes of ensuring workers did not injure themselves in the workplace while laboring with asbestos.

In the mid 1940s, the Navy, worried about the effect asbestos was having on the health of shipyard workers, hired a group of scientists to report on the impacts of asbestos insulation in terms of lung health. These scientists had spent most of World War II inspecting shipbuilding yards for proper asbestos management.

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techniques. Their work established asbestos policy for the next thirty years.\textsuperscript{15} In 1946, the Navy scientists published a scientific article titled “A Health Survey of Pipe Covering Operations in Constructing Naval Vessels,” which concluded that shipyard workers were in little danger due from asbestos fibers in the airborne environment of their workplace.\textsuperscript{16} The Naval group took chest X-Rays of workers at Puget Sound Naval Shipyards and observed workers working with asbestos products. Failing to recognize the latent period of asbestos disease, the report’s final conclusions was that, “since each of the three cases of asbestosis worked at asbestos pipe covering in shipyards more than 20 years, it may be concluded that pipe covering is not a dangerous occupation.”\textsuperscript{17} While the report went on to state the safety measures needed to protect workers, Navy officials ignored most worker-protection aspects of the report. The 1946 study provides evidence that the Navy was not interested in worker health in the long run. For the Navy, of immediate concern was workplace injury.

Environmental diseases like asbestosis are not instantly evident. They take time to form, and grow out of continual exposure to one environment.

On the part of the Navy scientists, there was a failure to understand how environments and medicine are linked. The Navy adopted the 1946 report as evidence that asbestos work was not dangerous, and failed to follow the report’s recommendations for safety procedures. In reality,

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\textsuperscript{15} Bartrip, 33.
\textsuperscript{17} Ibid., 16.
the Navy had few actual reasons to follow the recommendations since they were not at risk for paying for future diseases. While it set a threshold limit for asbestos exposure, the Navy did not capitalize on many of the recommendations. Navy foremen ignored, for example, the part of the report reading, “the dustiness of this operation warrants the use of exhaust ventilation or respiratory protection… although neither is generally used.” It also failed to realize the lasting implications of asbestosis, which the report defined as “a well-known industrial disease caused by only one thing—prolonged breathing of asbestos dust.”

Sadly, the view that asbestos was not so dangerous after all, which went against the majority of gathered data on asbestos up until that point, was the lasting idea that shipyard labor leaders drew from the 1946 report. Scientists knew asbestos was dangerous, yet scientists and the policy makers assumed it posed little risk for workers who used it daily, so long as there was at least some daily limit of asbestos exposure.

Because daily exposure was limited, levels of asbestos dust in the work place probably remained below the official recommendations of the 1946 Navy Study. A study conducted in 2009 focusing on the PSNS’s adherence to the 1946 guidelines found that workers were rarely exposed to levels of asbestos above the recommended maximum for the era; however, the limits set in 1946 we now know were entirely useless. The ones in contemporary shipyards represent a “one-hundred fold increase” from the limits set in 1946. This failure to establish effective limits had dire consequences for workers. Even in shops and ships where industrial hygienists mandated ventilation systems, the lack of worksite cleanliness led to loose fibers littering the ground. Only certain tasks and large jobs, such as welding, merited ventilation to fit with industrial standards, and because fiber samples were not taken regularly, temporary exposures definitely exceeded the 1946 limits.

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18 Ibid., 9.
These limits left workers at the shipyards with hazardous jobs. At Puget Sound Naval Shipyard located in Bremerton, Washington, ship workers used asbestos in cloth, cement, and even molded forms. Insulators worked directly with the asbestos in a multi-step installation process. The workers cut the materials by hand, using little or no protection. They mixed asbestos cement in simple buckets—dust spilling over the sides and into the air. Occasionally, if the job was large, workers brought a mixer inside the ship. A mixer was good. Unlike a bucket workers could “dump two or three bags of insulating cement in there, start the machine, and then add water.”20 While this made more cement, a bonus for workers who otherwise had to stir the cement by hand, it also created more dust. Since the tops of the mixing machines were open, the dust “boiled out” into the air until the water held it down. The entire process was “very dusty.”21 After the workers applied the cement, they next installed asbestos cloth over the piping. When they cut the cloth, according to Ralph David, the entire process was “right in front of you. You would cut off the length first and then tear the width of that you required, and it would be very dusty.”22

As the dust from these processes rose into the air it was not just insulators and asbestos workers who were exposed, but workers involved in other facets of ship work as well. Sheet metalists, machinists, pipe fitters, and welders all worked right alongside the insulators, exposing a wide variety of workers to the dust. Many times, more than one insulator was at work, and occasionally, eight to ten insulators would work concurrently in a room, contributing to a white haze that would hang throughout the rooms of the ship.

21 Ibid, 14.
22 Ibid, 15.
Images of shipyard workers from the period show that those working with asbestos were rarely protected as the 1946 Navy Report had said they should be. Workers in coveralls cut asbestos sheets, breathing just feet from the saw blade. The waste was allowed to fall on the floor, or put into ordinary trash bags attached to the tabletop. When pouring cement powder, the resulting dust was so great it obscured the workers in the photographs of the process—the key feature of the photos is not the workers, but the white haze of the dust. Photos of shipyard workers show insulators working bare-faced, others with simple paper masks, and some with industrial-grade masks. The Navy was not completely ignorant of their failings in keeping workers safe, and in the 1950s, the Navy hired hygienists to try and change the unsafe practices of the shipyards. However, this was a slow process.

As a field, industrial hygiene has its roots in progressive era reforms. The initial academic program in industrial hygiene was developed at Harvard in 1922, while the first professional organization was formed in 1939. Hygienists, hired to protect the companies from cases of workers compensation, suits, and workplace injuries, found that implementing change at PSNS was incredibly difficult. At PSNS, Carl Mangold and other industrial hygienists advocated for change in the mask rules in 1960, yet their efforts did little to change the culture within the Puget Sound shipyards. This was partially a result of a lack of incentives for changing labor practices and partially a result of a lack of worker knowledge.

Workers were widely unaware of the dangers they faced in the workplace. Unlike the case of Linda Nash’s agricultural workers, shipyard workers lacked the body of knowledge about

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24 Ibid.
25 Kitsap County Government, and the County Clerk. Deposition of Carl Mangold, Asbestos Litigation Style Files, Puget Sound Regional Archives Bellevue, WA.
asbestos dangers because of the latent period of the asbestos in the lungs. Workers felt the medical effects of asbestos usually only after they retired, and thus for those in the shipyards, there was no immediately evident reason to protect themselves. During the era, because there were no incentives or regulations forcing employees to protect workers, safety was left at the hands of workers who, unaware of the dangers, rarely participated in safety measures.

While masks were available to workers, there were no laws mandating workers wear them, and the encouragement to wear them came in the form of statements reading, “respirators… yours for the asking.”26 One shipyard worker, Dean Hammers, reported that “when it got dusty… hard to breathe… We’d use a respirator.”27 The common dust of the everyday was not enough for workers to wear masks. When airborne dust levels caused discomfort workers protected their lungs. Otherwise, they continued with business as usual, mask-free. Even workers who were ordered to wear masks often complained, for example, that the masks made beards impossible, were uncomfortable, or simply were just not necessary.

While scientists knew about asbestos danger, they did not apply their knowledge to work conditions. The science that hygienists applied, such as the 1946 Navy study, was incomplete and promoted inaccurate assessments of danger. Even these basic guidelines were hard to enforce, because workers themselves were disinterested in safety. For a change, it was not so much new medical knowledge that was needed but an increased awareness of asbestos dangers. Such awareness required a change in conceptions about the connection of human health and environment. The spark for this change came in 1962, with one doctor in New York deciding to research asbestos workers’ health at the same time the environmental movement of the 1960s began to take hold.

Disease in a new, critical landscape

Sparked by Rachel Carson’s *Silent Spring*, the environmental movement of the 1960s began a bipartisan drive to protect the environment and eventually human health. As Linda Nash has discussed, the movement led to a new effort to study and consider the link between human bodies and landscapes, particularly places where people worked. In this new anti-toxic landscape, Dr. Irving Selikoff, a researcher in New York, began publishing studies about workers and asbestos. In the more environmentally-aware climate of the 1960s these studies did not go unnoticed—actual opinions about asbestos began to change. This change was not quick but required further development of occupational healthcare. At the beginning of the 1970s, Nixon passed environmental legislation that mandated safe working environments and increased funding for research on diseases like cancer, an affliction then believed to be environmental in origin. This established a regulatory framework allowing for actual movement on the asbestos disease frontier—though actual change was slow to occur, and was characterized by failures to connect the plight of workers with the now well-known danger of asbestos.

In September of 1962, the same month that Houghton Mifflin published *Silent Spring*, Dr. Irving Selikoff stood in front of the conference of the Asbestos Workers Union and asked for their assistance in studying the impacts of asbestos disease on workers. While these...

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were not all shipyard workers, the Asbestos Workers Union represented insulators who worked directly with materials whether they worked for a private or public industry. Members of Seattle Local Union No. 8 were present as Dr. Selikoff declared to the union that “your men use complex materials often incompletely labeled or with the contents not labeled at all… this would be illegal if you were going to eat it but I suppose if you are only going to breathe it, it is all right.”

Why Selikoff decided to address asbestos is somewhat of a mystery, as is his entire medical career prior to the 1960s. However, it is clear that Selikoff was effective because he connected environments and the ailments of the workers he studied. And unlike earlier researchers, he took steps to apply his knowledge to the lives of workers across the nation.

While earlier studies had already showed the link between cancer and asbestos, the Selikoff article, unlike earlier ones, came at a time when people were interested in topics of environment and health. In 1964, Dr. Selikoff published the first of his results that unequivocally linked asbestos to lung cancer in the patients he studied at Mt. Sinai Regional Medical Center in New York City in the *American Journal of Pulmonary Medicine*. The workers, who had worked in shipyards in Brooklyn, showed significantly high rates of lung carcinoma. In April of 1964, the *New York Times* published this news in an article titled “a rare carcinoma believed on the rise” which detailed the fears of Dr. Selikoff that “construction workers exposed to asbestos dust in the New York City area show it to be far more common

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29 Ibid.
30 While Selikoff’s efforts were pivotal in establishing widespread discussion of the dangers of asbestos, medical knowledge of the harmful impacts of asbestosis disease had long established in journals involving lung health occupational diseases. Contrary to popular notions about when asbestos was first identified as a danger, scientists and doctors had been on the trail of asbestosis disease since the 1920s, when the term “asbestosis” was first coined. The ability of asbestos to cause asbestosis had long been understood, and as Alfred Angrist, the head researcher at the Lake Saranac, a pioneering research facility focusing on the dangers of asbestos, said at a court testimony in the 1970s, the facility did not even research the link between asbestosis and pulmonary fibrosis as even in the 1940s because there was, “no reason to beat a dead horse.”
among those exposed occupationally.\textsuperscript{32} In terms of asbestos disease, the Selikoff study and corresponding \textit{New York Times} article were seminal because they created a public discussion about asbestos disease, at the same time that action began to take place in other environmental arenas, allowing Selikoff’s research to fall on interested ears.

The new environmental consciousness of the 1960s was decidedly different than the conservation paradigm. Instead of environments as something to be preserved for human use, people began to think about environments and humans as connected, pristine environments as something to be saved, and healthful ecologies as something to be valued. Toxics, pollution, and environmental destruction became topics of discussion. Carson’s book, originally considered radical, sparked an environmental movement—one in which conservatives and liberals eventually found a united cause by the early 1970s. For the first time, the late 1960s saw individuals in the Puget Sound outside of the scientific researchers beginning to consider asbestos as a toxin.\textsuperscript{33}

At PSNS, the changes had begun in 1962 with the arrival of Carl Mangold as the head occupational hygienist, and occurred gradually from the late 1960s to the early 1970s. Mangold, who was educated as an occupational hygienist, began attempting to enforce safe working practices.\textsuperscript{34} In 1970, Mangold, released a report titled, “Asbestos Exposure and Control at Puget Sound Naval Shipyard” a report that categorized the previous forty-years of asbestos exposure in

\textsuperscript{33} The first comment on the dangers of asbestos in a local newspaper of the Puget Sound region occurred in 1965 in the form of a small political cartoon buried in the classified section of the newspaper. In 1967, Al Diffenbach, the \textit{Seattle Times} medical editor published an article claiming that “Workers and city-dwellers will face an increasing risk of lung disease and pulmonary cancer from inhaling asbestos fibers.”
\textsuperscript{34} Mangold, I believe, shows that environmentalism was not necessarily begun with Rachel Carson, but actually was borne in colleges in the 1940s. Most doctors depositions said they learned about the connections between environment and health while studying in the 1940s. Though I have little to prove it, the depositions of these individuals indicates that action was rooted at academic institutions in the 1940s, and only once these individuals got into roles where they could actually impact policy, did popular ideas begin to change. The 1960s movement was perhaps a popularization of these ideas more than a revolution.
his shipyard. Mangold’s report documents a pattern of both adhering to and ignoring safety standards on behalf of both hygienists and workers. According to the report, respirators were officially issued to workers in the 1950s, and were mandated in 1960. Yet, a study in 1968 found that “76% of the insulators did not use a respirator” and “50% of all insulators did not have a respirator in their possession.” The report blamed “poor face fit, breathing resistance, and comfort” as the reasons for failure to comply with regulations as well as poor enforcement.35 The same report published in 1968 found that workers “were aware that exposure to asbestos, even at low concentrations, is hazardous. The attitude prevails that the hazards are unavoidable and must be accepted as part of the trade.”36 For many workers, the dangers of asbestos were simply “part of the job.”37 In their safety programs, the Navy referred to people who did not adopt safety measures as the “old timer.” According to one PSNS publication, the “old-timer or smart character may look humorously as an informed and cooperating worker carefully adjusts his respirator before ripping off reams of amosite or asbestos piping.”38

For most workers, knowledge of the dangers of asbestos disease was not prevalent until the late 1970s. At an asbestos industry conference in 1973, for instance, Matthew Swetonic commented that “the good news is that despite all the negative articles on asbestos-health that have appeared in the press over the past half-dozen years, very few people have been paying attention.”39 Though he was commenting on consumers and asbestos, asbestos workers, too, remained ignorant even as OSHA implemented safeguards and mandated changes in the working conditions at local shipyards. At Todd Shipyards in Seattle, for example, a group of workers

37 Ibid.
38 Kitsap County Government and County Clerk, "Deposition of Ralph Vernon David."
petitioned the shipyard about the health practices writing, “Todd says everyone has to shave and be fitted with a respirator because the law says so. The Law also says respirators are only to be worn until proper engineering controls are developed to control the hazard,” before lamenting on the fact that workers were unaware of what hazards, in particular, they faced. In this strange case, workers mobilized against protections, primarily because they did not realize the issue of asbestos disease.

This failure to ensure workers took interest in their own health was one of the difficulties in addressing asbestos disease. Workers like Ralph David never even recalled meeting the industrial hygienists during their time in the shipyards. Ralph David claimed that, “We didn’t have anybody that wore respirators or that were instructed to wear respirators” and could not remember ever meeting an industrial hygienist who worked at the shipyards. For workers like David and even Monte Anderson, the availability of protective equipment was an unknown. The main avenue of dissemination of health information was through worker publications, which many workers never read. Even these only mentioned health regulations on rare occasions and with no specifics about why workers ought to wear respirators and masks to protect themselves. The substance was a rare topic in journals like the King County Labor Council’s Scanner, or in the Salute, the workers newspaper for the Puget Sound Naval Shipyard. These publications spent the late 1960s and early 1970s focusing on eye protection and other devices that protected workers from immediate accidents rather than chronic work diseases.

Dr. Selikoff tried to directly inform workers himself. In each edition of The Asbestos Worker, for example, a publication titled The Insulation Hygiene Progress Report announced the

40 Ship Scalers Dry Dock and Miscellaneous Boat Yard Workers Union Local 541, Todd Says It Wants to Abide by the Law but They Only Do It When Its Convenient for Them, Ship Scalers Dry Dock and Boat Yard Workers Union, Local 541 records, University of Washington Special Collections Seattle, WA.
41 Kitsap County Government and County Clerk, "Deposition of Ralph Vernon David. ", pg. 81
newest knowledge of asbestos disease to workers who were members of the Asbestos Workers Union. However, workers who were not members of the asbestos workers union did not receive this publication, and other labor journals in the Puget Sound region were generally mum on the subject of asbestos. According to Ralph David the “very first time that I can say that I was warned that it (asbestos) was dangerous or causes disease was…in ’77 or ’78.”

While these publications looked to reform work practices, there were still few incentives to ensure companies protected workers. It was not until the height of the environmental moment at the beginning of the 1970s that such practices began to change. At that time, federal regulations made workplace asbestos safety not just a good moral principle but a federally enforced statute. This provided a major shift in the asbestos landscape because it made following safe-working guidelines both legally and financially binding.

By the early 1970s, the environmental ethic of the entire country had shifted to the point that even President Richard Nixon jumped on the environmental bandwagon in order to avoid losing the “environmental” title to potential challengers such as Henry “Scoop” Jackson, a Washington State senator who also intended to capitalize on environmentalism. On January 1, 1970, Nixon signed the National Environmental Policy Act—and forced federal government agencies to consider the environment in their decision-making processes. Later that year, Nixon signed the Occupational Safety Act in response to a growing number of

Figure 5: Richard Nixon on the front of The Asbestos Worker after he declared the war on poverty. Source: The Asbestos Worker, September 1971

42 Ibid.
occupational health claims, in an attempt to protect the some “2.2 million workers who are
disabled each year” which it valued at “250 million man days.”43 The act resulted in the
incorporation of a new federal agency, the Occupational Health and Safety Administration
(OSHA), which set standards for worker protection, worker benefits, and worker exposure to
dangerous chemicals and substances. The OSH act even articulated a federal desire in protecting
workers from disease. The language of the act expressed a federal interest in;

exploring ways to discover latent diseases, establishing causal connections between
diseases and work in environmental conditions, and conducting other research relating to
health problems, in recognition of the fact that occupational health standards present
problems often different from those involved in occupational safety…44

Thus, one of the first acts of OSHA was to begin enforcing a new asbestos culture. OSHA
tightened the 1946 exposure limits, and forced industrial users to institute simple worker safety
measures. While these guidelines were only slowly adopted and strengthened over the next
fifteen years, OSHA took responsibility for health away from workers, and instead made it the
job of corporations. While workers often complained, this was a first step in reversing the long
trend of workers failing to comply with recommendations.

Nixon’s pursuit of health and environmental safety did not end there. In 1971, Nixon also
declared a “War on Cancer,” and passed the National Cancer Act which provided the funding for
the medical facilities that would diagnose former workers.45 These federal actions made
workplace environment a local responsibility, and created the political atmosphere and
regulatory framework in which workers actually could be protected.

While workers remained unaware of asbestos disease, shipyards, the federal government,
and labor advocates encouraged a reformation of labor practices. The early 1970s saw

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workplaces significantly modify their hygiene practices, adopting practices that actually protected workers from the hazards of asbestos. After the establishment of OSHA as an organization in 1971, it made asbestos safety one of its primary targets. OSHA worked with the Department of Labor to ensure safe asbestos practices, and OSHA’s importance cannot be overlooked. For the first time, OSHA provided federally enforced statutes to protect worker health and ensure safe working environments. It forced local agents, such as industrial hygienists, to begin taking action, and sparked the beginning of the first federal actions to address shipyard working conditions.

For instance, in 1972, the US Department of Labor hired Mangold to give a series of lectures on the dangers of asbestos in shipyards. Local TV stations broadcast these lectures, and one thousand fliers were sent out to workers detailing the dangerous link between asbestos, lung disease, and cigarette usage. The 1972 campaign showed an effort by the federal government to spread the message about asbestos dangers, yet it was ineffective. Though it was a start at informing workers, it did not create the widespread awareness that the Labor Department sought. Also, because the campaign only focused on current workers and promoting proper work techniques, former workers were not exposed to information that would help them act on their case. For former asbestos workers, or those not currently employed in an asbestos trade and therefore outside the Department of Labor’s jurisdiction, there were simply no groups of individuals looking at addressing their plight. Instead, the 1970s saw attention on asbestos directed at schools and water supplies. Though people were finally connecting asbestos and bodies, there was simply little interest in informing workers.

47 Kitsap County Government and County Clerk, "Deposition of Carl Mangold, 1981-1990," Asbestos Litigation Style Files, Bellevue, WA.
Throughout the 1970s, local citizens interested in the environment applied their fears of asbestos to public spheres where the substance had few, if any true impacts. However, the shift was the beginning of adopting a precautionary principle, and indicates that the public, albeit slowly, was beginning to grasp that environmental toxins had real effects. As early as 1975, King County Department of Health officials were worried about asbestos in the Tolt River water supply because of potential public backlash. It compared levels of asbestos in their own supplies to those in San Francisco, Duluth, and other cities with known asbestos in the water. Even before the information was made public, in an EPA Press release in 1975, Seattle City Water took efforts to buffet itself against a public backlash against something that was, “not an imminent health hazard,” going as far as petitioning the EPA to ensure their report properly discussed the lack of danger from asbestos.48 A few years later, the asbestos-water controversy exploded. On Wednesday August 23, 1978, the Seattle Post-Intelligencer ran a piece titled, “Does Our Water Cause Cancer?” which analyzed the possibility that some 300,000 people in Seattle were ingesting water contaminated with asbestos fibers, while another 200,000 in Everett were doing the same.49 The article blamed water from the Tolt River and Sultan River for “putting asbestos into their stomachs and so through their digestive tracts” and went on to state, “The question is whether as sensible people we want to make a bet that asbestos in water is not lethal like asbestos in air. That bet involves a large group of people who have no vote, no political clout yet—our children.”50

Later that year, children again became the target of an anti-asbestos movement when Peter Brysse, a medical professor at the University of Washington, led a group of parents who

48 “Fact Sheet: Items Which We Feel Should Be Included in EPA's Public Announcement of Seattle Area Water Quality,” Seattle King County Department of Public Health Records, Directors Files, Seattle, WA.
49 Ibid.
complained to the Seattle School District about high levels of asbestos in Seattle Schools.\footnote{51} While the Seattle School District initially refuted any danger in the Seattle Schools from friable asbestos, a media firestorm pursued the school district, led by articles published in local newspapers with stirring titles such as “Is Your Child Breathing Death?”\footnote{52} The school district eventually conceded to the demands of the parents, and agreed to asbestos remediation, but only when it became evident that the school district could be liable for any cancer caused by asbestos. By then, the efforts of Breysse and his cooperating parents had pushed the presence of asbestos in schools debate into federal discussions, effectively resulting in a federal regulation mandating asbestos abatement in schools in the 1980s.\footnote{53} Yet, one of the only reasons the asbestos in schools debate took off was because in 1973 asbestos manufacturers were found culpable in an asbestos suit in Texas. In 1973, the case Borel v. Fibreboard\footnote{54} played host to the first successful litigation by a plaintiff against an asbestos-manufacturing company. With the case, not only were manufacturers held responsible, but groups like school districts began to fear they, too, would be held liable if people began getting sick.

For the workers who were already sick, Borel v. Fibreboard provided a legal means for former workers to gain compensation for their health problems—a vital step towards addressing the asbestos crisis, considering former workers were not eligible for workers compensation because of time limitations on claims. The case made possible action not just in reforming work practices, but provided an incentive for health experts to work with patients. However, in 1973, former workers still remained unaware of the dangers, and it was nobody’s job to inform them.

\footnote{52} Ibid. See also "Peter Breysse," The Seattle Times/Post-Intelligencer, March 23 1986.
Yet, the stage was set. Government dollars, a regulatory framework, and a legal means of restitution finally shaped the scene in which informing workers was deemed a necessity.

**Putting the Focus on Asbestos**

Utilizing this atmosphere, consumer activism was the final catalyst for change because consumer activist groups possessed the capability to put pressure on government organizations to force actual change. Born out of concerns about consumer product safety, 1970s era consumer groups focused on public health and well-being. Ralph Nader’s consumer group pushed the Navy and HEW into implementing effective educational campaigns in conjunction with the medical infrastructure. As a result, occupational medicine doctors and cancer researchers were mobilized into a new fight to educate and diagnose workers who were at risk for asbestos disease. This effectively reconnected environments and health, and brought about the formation of new medical communities, which focused on work environments as the critical element in worker health.

In 1971, Ralph Nader founded the Public Citizen’s Health Research Group as a group to lobby Congress for the protection of consumer’s health. Over the next twenty years, Nader’s group became pivotal in arguing for the public health of citizens and for increasing the impact of OSHA. In October of 1977, the Public Citizen’s Health Research Group wrote to the Secretary of Defense, Harold Brown, recommending that, “the Navy stop proposing more research and act immediately to notify and compensate past and present shipyard employees who were likely to have been exposed to asbestos.” While initially the Navy decided that “the United States does not have such an obligation” to inform retired individual workers about asbestos exposure, they

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did decide eventually that they ought to cooperate and act to help educate former workers as well.  

On February 10, 1978, the Navy responded by holding a subgroup, called the Armed Forces Epidemiological Board Subcommittee on Asbestos-Related Problems, in New York City. Led by Dr. Paul Kotin, Marvin Kuschner and Irving Selikoff, the board was tasked with “preparing a background document that could be used as the basis for recommendations… regarding shipyard workers who in the course of their employment may have been exposed to asbestos.” According to their report, “approximately 4.5 million people” worked with asbestos in shipyards during World War II, and approximately two million others had worked with asbestos in shipyards since World War II. Even with deaths, they estimated that the number of currently impacted workers could number four million, and thus they urged a large-scale information campaign on the part of the Navy to increase worker knowledge of asbestos disease and bring yet unfound cases to light. The report recommended that the Navy work to educate former and current workers through “voluntary agencies such as the American Lung Association and the American Cancer Society” and medical professionals in order to “facilitate a crash expansion of medical knowledge on asbestos-related health problems and to develop consultation centers on a regional basis for referral expertise in clinical diagnosis, pathology, and x-ray reading.” This program looked to educate workers primarily through presentations to unions, presentations to management, and presentations to the armed forces.

56 Health Research Group, "Health Research Group Recommendations for Navy Asbestos Policy, 1978," Seattle King County Department of Public Health Records, Directors Files, Seattle, WA.
57 Edward Hidalgo and Assistant Secretary of the Navy, "Letter to Peter a Greene and Sidney M Wolfe, 1978," Seattle King County Department of Public Health Records Directors Files, Seattle, WA., 1.
58 US NAVY, "Report: Subgroup of the Armed Forces Epidemiological Board Subcommittee on Asbestos-Related Health Problems, 1978," Seattle King County Department of Public Health Records Directors Files, Seattle, WA. 1
59 Ibid, 2.
The letter of April 8, 1978 sent from Assistant Secretary Edward Hidalgo to the Public Citizen, outlined the program, saying “in 1946 a Navy study concluded that asbestos dust generated during shipbuilding and repair did not constitute a hazard,” a belief that he claimed “prevailed until recently.”60 At the same time, he denied a scientific knowledge of asbestos disease in shipyards that had been proven and re-proven. Hidalgo announced a plan to work with the Department of Health Education and Welfare on an education program for shipyard workers—the very type of program that Dr. Selikoff and his associates years earlier had informed the Navy would prove beneficial.

Thus, began the effort to “put focus on asbestos” as a program of the Department of Health, Education, and Welfare.61 With environmental ideas attractive to a public audience, federal regulations protecting current workers and advocating for workplace health, and federal agents willing to cooperate with local doctors to inform former workers, asbestos-caused disease was finally a subject that the nation, and Puget Sound, was ready to address. The focus was not broad, but instead city-specific, with money and resources provided to local groups in Seattle and fourteen other cities nationwide. As a result, HEW’s campaign was able to utilize local resources. It took advantage of local clinics and emphasized medical facilities that connected health, work and environment.

The campaign to inform workers was supposed to begin on July 14, 1978. When it finally did begin in August, it came in the form of a “large scale public information campaign concerning the adverse effects of occupational exposure to asbestos.”62 The federal government chose Puget Sound accordingly based on the high number of shipyard activity that occurred in

60 Ibid.
62 Lawrence Berner and Director of Public Health, "Letter to Mary Ellen McGaffree, Director Budget and Program Development 1978," Seattle King County Department of Public Health Records, Directors Files, Seattle, WA.
the region. Part of the campaign was purely informational about the dangers of asbestos, while another part informed workers how to get help—locally.

HEW designed three informational booklets with titles like, “Asbestos Exposure” and “Clearing the Air.” The Department of Public Health then distributed the booklets to supermarkets and Social Security offices. HEW also asked health officials in Seattle to “make personal appeals to radio and television stations,” contact newspapers and magazines, and mail out informational booklets. HEW even provided administrators and front-desk facilitators at medical facilities with special books to aid their discussions with workers. Television advertisements, radio advertisements, newspaper advertisements, and other public media materials were prepared in a method similar to a modern anti-smoking campaign. Rather than placement by a national agency, local groups placed spots, which were fitted with local addresses and phone numbers.63

In one television advertisement, a family learns that a friend named Charlie has a lung disease caused by asbestos, at which point they connect that their grandpa, too, worked in the shipyards with asbestos products. At that point, Grandpa walks into the room stricken, and announces, “I was just talking to poor old Charlie…” before the screen freezes, leaving viewers to question if they too might have the disease. For workers, advertisements such as these were powerful partially because they included an avenue by which to seek treatment. The asbestos disease advertisements encouraged workers to go to a local facility to be tested for disease.64

In the Pacific Northwest, the King County Department of Health organized the campaign through the Fred Hutchinson Cancer Institute. Dr. William Hutchinson had founded the Fred

63 David P Miller, "Minutes: Meeting On "Asbestos Awareness Campaign", Bethesda, MD Letter to Dr. Walt Miller, 1978," Seattle King County Department of Public Health Records, Directors Files, Seattle, WA.

64 Ibid.
Hutchinson Institute in conjunction with the Pacific Northwest Research Foundation. Hutchinson named the center after his brother, the famous baseball player Fred Hutchinson who died of cancer in 1964. It opened on Seattle’s First Hill in 1975, had facilities to screen workers for lung abnormalities, and had the medical expertise to address cases of mesothelioma and lung cancer. Twenty years prior, such a facility would not have even existed in the country. In 1955, the National Cancer Institute was founded to research cancer in the United States, which led to the establishment of facilities like the Fred Hutchinson Center that were dedicated primarily to cancer. In 1971, Nixon signed the National Cancer Act, increasing the power of the National Cancer Institute, and providing more federal dollars for research into the causes of and potential cures for cancer.65 The capabilities of facilities like the Fred Hutchinson Center were new within the field of medicine. While William Coolidge created the first x-ray tube in the 1890s, medical imaging techniques advanced little further until the 1960s.66 However, by 1978, the Fred Hutchinson Center and other health facilities also had newer imaging methods such as the CT Scan, which British engineer Godfrey Hounsfield invented in 1972.67 Methods of diagnosing cancer were becoming much more widespread and technologically oriented. In 1967, marketing began for the first mammography imaging systems, and the first widespread screening programs started for cancers of all kinds, not just diseases pertaining to asbestos.

With the participation of local institutions such as the Fred Hutchinson Institute, workers not only gained access to educational resources about asbestos disease, but also were able to receive a medical consultation as to whether or not they were infected. As a part of the HEW program, even general practitioners were informed of lung disease problems caused by asbestos.

67 Ibid., 157.
so that they could provide referrals to workers in need of a pulmonary specialist. At places like Swedish Hospital’s Polyclinic, and Everett’s Providence Medical Center, pulmonary specialists helped provide diagnosis as well.

In addition, for the first time, clinics across the country opened that focused primarily on workplace diseases. In 1981, the Harborview Clinic for Occupational Health opened its doors to workers in need of council on their health issues. The clinic was hospital based but linked to University of Washington Medicine, and thus jointly operated as a research facility and clinical practice. Linda Rosenstock, who received her MD from the University of Washington in 1980, was hired by the clinic as one of the first doctors focused on occupational health.

At the time of its establishment, the Harborview Clinic was one of only fifteen such facilities in the United States. Only two of those fifteen facilities were older than two years, with one of them being the Mt. Sinai Facility in New York, which pioneered the asbestos disease research. These new facilities differed greatly from previous facilities because they focused on the workplace and health while lying outside the jurisdiction of industry. They hired medical experts who were skilled in diagnosing industrial illness, and they worked with unions to assess and treat workers. Rather than focusing on protecting companies, as hygienists had, occupational clinics could diagnose workers and inform them about how to address their ailments not only medically, but in terms of dealing with employers to gain financial compensation.

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68 Kitsap County Government and County Clerk, "Deposition of Linda Rosenstock, 1984," Asbestos Litigation Style Files, Bellevue, WA.
70 Kitsap County Government and County Clerk, "Deposition of Linda Rosenstock."
One of the first tasks of the Harborview Clinic was a survey of asbestos workers for lung abnormalities, which they conducted through offering free asbestos consultation appointments. As a result of these meetings, the clinic conducted its own widespread survey of workers in the region, tracing asbestos disease throughout the community through radiographic evaluations of asbestos disease in the lungs. As a part of this, the clinic worked directly with labor unions not only to help diagnose workers' problems but to document about unbenefficial work practices, and provide worker education programs. As an academic institution, the clinic also amassed data to provide information on how environmental disease such as asbestosis and mesothelioma affected worker populations.\footnote{Kitsap County Government and County Clerk, "Deposition of Linda Rosenstock."}

From Seattle to Everett to Longview, Washington, local hospitals had funded educational programs since the late 1970s; yet, during the 1980s events such as the Clean Air Conference gained increased prominence. Groups such as the Washington Lung Association, a local subsidiary of the American Lung Association, as well as by medical clinics, sponsored the air conferences. The educational events included expert medical doctors like Dr. Pete Brysse and Dr. Rosenthal, both of the University of Washington. The events did not just focus on education about asbestos dangers, but also on how workers could earn benefits to help

Figure 6: Leonard Hermann was the first successful plaintiff in an asbestos litigation case from Washington State. Source: Don Fair, “Asbestos Victim Wins $243,000 Judgment”. Seattle Post-Intelligencer, October 17, 1981.
alleviate their ailments. Those advertising the conferences worked with unions to gain rosters and thus, hopefully large numbers of attendees.

The events all followed the same general pattern. For example, on August 19, 1983, workers from local shipyards and construction firms attended a clinic at Providence Medical Center in Seattle, Washington to hear the story of asbestos. Dr. Hugh G Merriman, told attendees about how lungs would respond to asbestos fibers, Nick Heyer, from the Harborview Occupational Medicine Clinic gave a demonstration of a lung testing procedure, and lawyer Scott Stafne, a lawyer, presented on the legal options for lawyers. By 1983, the legal options for asbestos litigation were tremendous. During a similar convention in Tacoma in 1978, the discussion had been about disability benefits; however, after the first money was awarded to Leonard Hermann in a Washington State asbestos litigation case in 1981, the gateway was truly opened for local employees to seek recourses for their health problems.

Conclusions: The realm of future asbestoses

The lasting impact of informing workers about asbestos disease, while providing for justice for those workers impacted, is often seen as a negative to people in law or business fields who fear the overbearing burden on the court system and manufacturers. Since 1981, legislators have argued numerous proposals designed to limit asbestos disease torts due to the cost on the court system and a backlash against trial-lawyer profiteering. During the 1980s, asbestos litigation became almost a bad word, and the public classified workers not as receiving just compensation for damages to their health, so much as cashing-in on a previously harmful working condition. However, this backlash occurred in a new era of environmental thought.

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While Nixon in a spur of the moment political action created the nations most encompassing environmental legislation, Reagan slashed funding for such programs, and created an image of environmental protections as a hindrance to economic prosperity. The political pressures of this change have effectively prevented asbestos from being banned in the United States, where today large groups of the population see environmental regulations a limit on business much more than a protection of workers.

As this paper has strived to show the role that health workers, federal regulations, consumer groups, and workers played in reconnecting environment and occupational health, it has undoubtedly left out important actors in regions disparate from the Northwest. Studies of other regions would likely show different stories, and could help to explain how one substance shaped shipyards, towns, and the medical community alike. This research is important, because responses to asbestos provide a window into how human understandings of environment and human health have changed over time.

The asbestos disease battles had a lasting impact on the work atmosphere of the Pacific Northwest. Today, workers have resources to ensure they have access to protection and treatment when an environmental hazard endangers their health. OSHA regulations are stricter today than they were initially, and in the shipyards, the litigation from environmental suits has put the cost of not protecting workers greater than the cost of providing protections in the first place. Ultimately, putting a stop to the disease helped fund a new infrastructure and redevelop a linkage between health and environment in the workplace. While the asbestos disease epidemic scarred the lives of millions, costing the United States and its corporations millions of dollars, in the end, it helped play a pivotal role in establishing a system to prevent such crises from occurring again.

Yet, we should not feel safe in our assumptions about environments and workplaces either. The
story of asbestos should compel us to address environmental issues, to apply our knowledge, question our assumptions, and actively work to protect those who labor each day in dangerous environments.
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