Refining the Desert: The Politics of Wealth, Industrialization, and Environmental Risk in the Twentieth-Century Texas Oil Industry

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Refining the Desert: The Politics of Wealth, Industrialization, and Environmental Risk in the Twentieth-Century Texas Oil Industry

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This dissertation describes seventy years of West Texas oil expansion and decline juxtaposed against a growing environmental and public health crisis. It tracks the experiences of industry employees, demonstrating that their understanding of oil industrialization and the environmental cost of economic success was complex and changed over time. Rather than assuming that simple greed allowed industry personnel to ignore resource depletion and environmental contamination, this dissertation argues that a workplace culture of individualistic risk-taking coupled with industry propaganda that bred a utopian faith in technology was reinforced by the region’s punishing geography, general isolation, and the limits of industrial infrastructure.

This project expands the thematic and geographic scope of current energy history scholarship, using the intertwined themes of environmental, personal, and economic risk to demonstrate the cultural contingency of energy system development. Bridging the disciplines of labor, environmental, and technological history, this project demonstrates that West Texas, along with regional innovations in oil technology and science, were central to both US petroleum development and indicative of broader twentieth-century debates about government control over natural resources and the acceptable victims of industrial contamination.
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Introduction

The Permian Basin encompasses approximately 68,000 square miles in what is today Southwest Texas and Eastern New Mexico, stretching from southern Lubbock County in the Panhandle to Jeff Davis County on the Mexican border. Between 1923 and 2015 over 29 billion barrels of crude oil and 75 trillion cubic feet of natural gas were pulled from reservoirs beneath the Permian Basin, making it one of the most prolific energy-producing regions in the world. As of 2002 the Permian Basin represented seventeen percent of total yearly US oil production and contained an estimated twenty two percent of proven US oil reserves. In 2016, new shale oil discoveries suggested that 20 billion barrels may still lie below the region’s shifting sands.

Over the course of 70 years of oil production, the unrelenting search for oil transformed the Permian Basin’s ecology and facilitated a wave of human migration to the isolated and harsh region. Oil heavily altered the existing ranching economy with a complex industrial network designed to find, extract, transport, and process crude oil. For the next 70 years, virtually all human action was touched by oil extraction and the regional landscape reflected a focus on capital accumulation. The ebb and flow of oil discovery fueled massive residential construction in the region’s cities and towns. The twin cities of Odessa and Midland, located 305 miles east of El Paso and 230 miles from the Mexican border, sit at the geographic and economic heart of the Permian Basin. After the discovery of oil in the early 1920s, oil extraction and processing became both cities’ defining feature. New roads, civic buildings, and public utility companies were funded through oil industry tax revenue. Members of the oil industry controlled the economy, legal system, land management, and human migration for the next seventy years.

Although impressive in both size and sophistication, this vast system came to a crashing halt in 1983 when global oil prices abruptly bottomed out. West Texas producers, heavily in debt after a record-setting year of exploratory drilling, were hit particularly hard. Beset by their creditors and with no available cash to pay their employees, most regional oil companies went out of business. As industry downturn

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4 The National Oceanic and Atmospheric Administration cites the Permian Basin as encompassing some of the driest and hottest regions of Texas. The semi-arid Trans Pecos climate zone makes up the southern half of the Permian Basin and runs from just south of Odessa to the Mexico border. To the north and east, the High Plains and Edwards Plateau provide more precipitation and surface water. National Oceanic and Atmospheric Administration, Climate Prediction Center CPC GIS Data, accessed June 28, 2017, http://www.cpc.ncep.noaa.gov/products/GIS/GIS_DATA/.

5 The increasingly powerful Organization of Petroleum Exporting Countries (OPEC), looking to flex their muscles, cut oil prices in 1984.
became a decade-long depression, many oil workers and their families abandoned the Permian Basin in search of other employment, leaving behind discarded drilling operations, defunct pipeline projects, and hastily constructed and quickly abandoned oil towns. In Odessa and Midland, downtown office complexes were slowly abandoned and the cities’ sprawling suburbs fell into disrepair.

By the 1990s some area residents began to question why the drop in prices so thoroughly decimated the industry. Many blamed intrusive federal regulations and overbearing environmental protection laws for the region’s slow improvement. Others began to question the benevolence of an industry that had for decades sustained both community growth and personal wealth. Some Odessa residents, surrounded by the oil industry’s industrial detritus, shuttered offices, and moldering refineries, became concerned about the damage to their health caused by the decades of oil refining and petrochemical production. These residents were particularly concerned about the vast Odessa Petrochemical Complex, south of the city limits. In 1995 the Odessa, Texas branch of the National Association for the Advancement of Colored People (NAACP) took over an ongoing class-action lawsuit filed in 1991 by South Odessa residents against petrochemical processors Shell, Rexene, and Dynagen. The lawsuit accused the companies of gross negligence, declaring that inadequate waste disposal and air emissions equipment at the Odessa Petrochemical Complex were responsible for

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breathing problems and increased cancer rates among people living in the predominately black and Latinx neighborhood. The NAACP cited Dynagen’s failure to fully address the over 500 safety violations – including unsafe wastewater disposal practices and unchecked air contamination from daily chemical burn-offs – that had been found by state inspectors in 1988 when, in an abrupt reversal of its past policies, the state fined Dynagen $1.4 million and ordered the company to update waste disposal equipment immediately. As late as 1994, Dynagen had installed little of the court-ordered emissions control equipment.

The NAACP lawsuit gained international attention, with commentators calling into question the safety of not just the neighborhood, but of all the 200,000 people living in the Odessa/Midland metro area. In 1997, after rejecting an initial lump-sum settlement, the NAACP won the case. Over 850 plaintiffs received an undisclosed monetary settlement and Dynagen was forced to install $12 million worth of pollution control equipment.

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8 “Rexene Corporation 1995 Annual Report on Form 10-K, Part 1,” Rexene Corporation, 1995, United States Security and Exchange Commission, accessed October 15, 2016, https://www.sec.gov/Archives/edgar/data/829218/0000912057-96-004686.txt.; Mark Rose, “NAACP Fumin’ Over Rubber Plant Emissions in West Texas,” The Crisis, 101:4, February-March 1994. The ethnic makeup of Odessa’s nonwhite population has changed over time. Along with African Americans headed West, the city also included Tejanos – people who were descendent from settlers given land during Texas’ period of Mexican statehood, Mexican migrants who headed north to work in south Texas agriculture and later moved into the region’s urban centers, and, in the 1980s and 1990s, immigrants from Central and South America. I use the blanket term Latinx to describe the diverse population descended from Spanish Tejas, Mexico, and Central and South America.

9 The initial fine of $4.4 million was later reduced to $1.4 million. It represents the largest fine by the State of Texas for environmental contamination since the Texas Clean Air Act of 1965. The 500 violations still represent the largest number of citations ever given to a Texas industrial site. “75th Anniversary,” Odessa American Online, accessed October 15, 2016, http://www.oaoa.com/75th_anniversary/article_96695196-5671-11e5-82e5-5b7a0a1e020f.html.
equipment. Odessa gained a dubious reputation as “the most polluted city in America” and descriptions of the "Odessa syndrome" – a malady that included sore throats and eyes, headaches, nausea, and bloody noses – proliferated in the popular press.

Despite the geographically widespread nature of the contamination and although pollution had most likely been ongoing and unchecked since the early 1950s, national industry publications, local periodicals, as well as city government records and court documents reveal almost no critique of the petrochemical industry before the lawsuit became a media sensation. Further, even after the court case became well-known, local officials and regional publications had little to say about the plant’s toxic history.

Such silence leads to questions. When did Permian Basin residents become aware of the environmental costs of oil processing and chemical production? How complicit were regulatory officials and local administrators in the contamination of vulnerable populations? At any time, did residents and industry employees knowingly accept health risks in the name of economic stability? This story also invites broader historical questions about Texas industrialization and the development of American oil culture. How did members of extractive communities understand their relationship with the land?

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and the ecologies that sustained their livelihood? To what extent did the industry’s support for racial segregation shore up oil’s cultural cachet among West Texas’ white residents? Although organized labor was widespread at twentieth-century Texas refineries further east, what prevented worker unionization in West Texas? Lastly, how did oil communities reconcile a mythology of individual rags-to-riches success with the industry’s increasingly complex, integrated, technological systems and its failure to deliver upward mobility to many of its employees?

I answer such questions in this dissertation. I use the Permian Basin’s seventy-year story of industrialization and decline as a case study tracking oil production’s uneven environmental and public health consequences. Challenging common booster rhetoric that sees environmental degradation as an indicator of economic stability, I demonstrate that as the region’s natural environment became dominated by the oil industry a series of conscious choices were made by industry officials, workers, and residents that set the boundaries of acceptable environmental, economic, and social risk. These boundaries were constantly negotiated and renegotiated, shifting the development of community geographies and political structures.

I focus on the experiences of Permian Basin laborers, contractors, drillers, scientists, and engineers in the years leading up to the 1983 crash, arguing that community interpretations of industry contamination and natural resource depletion were mediated by several factors. Personal hardship due to the region’s harsh climate and the industrial limitations created by a lack of water gave oil workers and their families a sense of community based on a constant battle with nature. Permian Basin oil communities were defined by their impermanence for the first half of the twentieth
century. Because it was assumed oil would eventually dry up and people would move on, elites did not want to invest in local infrastructure and residents were largely unconcerned about the long-term consequences of their actions. Shoddy housing, lack of sanitation, and unsafe working conditions made the search for oil in an isolated and arid region even more risky. After World War II, regional oil infrastructures became more complex and communities more permanent. However, the sense that oil communities were fighting against nature for their survival persisted. A general lack of attention to long-term consequences of industry development continued to be a common theme in the popular press and in oral history interviews into the 1980s.

Despite widely-held notions that their communities were temporary, oil workers developed a sense of ownership and control over both the land and the oil industry through region-specific technological, chemical, and geological knowledge. Successful oil drilling required deep knowledge of surface and subsurface ecologies. Navigation in the isolated and monotonous Permian Basin required understanding of local topographies. The creation of gasoline, rubber, plastic, and other petrochemicals from Permian Basin crude required understanding of chemical processes and experience using and troubleshooting heavy machinery. Such shared work experience and technological competence created an insular community that shunned outsider advice or criticism. As the oil industry remapped the region, building pipelines and transfer stations that crossed the barren deserts and constructing refineries and gasoline plants in previously isolated small towns, this new technological system more closely linked regional economies to the fate of the oil industry.
The influx of massive regional oil wealth, which fueled the building of community and infrastructure, also helped to create an insular, staunchly pro-oil political culture. After 1924, almost all regional residents were affiliated with the oil industry, making the perspective and culture of the oil industry became nearly synonymous with the perspective and culture of the whole region. The imagery and iconography of the preexisting, hyper-masculine ranch-based culture quickly merged with a pervasive faith in the power of industrial science. Cowboy machismo and oilfield speculation melded together leading oil employees and many residents to see changes to land, political hierarchies, and the economy as a logical evolutionary step, not as outsider intrusion. Local press, civil leaders, and industry boosters used a constant narrative of progress and modernization to reassure residents that industry expansion would lead to regional sophistication and importance. Such narratives helped local elites thwart labor organizing and allowed industry boosters to sell oil expansion to residents by equating the fate of the oil industry with the fate of the entire community.

Although the oil industry dominated political life in the region, it did not disrupt Texas’ established hierarchies of class and race. State policy and local political discourse described the arrival of first ranching and then oil as a civilizing process that would help to solidify white, Anglo-American control over Texas’ border region. This was reinforced by segregated hiring practices that barred the region’s black and Latinx populations from lucrative oil industry jobs as engineers, drillers, machinists, or refinery technicians. Relegated to domestic service, farm work, or manual labor people of color only saw a small percentage of the region’s oil wealth. Residential segregation that relegated nonwhite communities to unincorporated land on the outskirts of the region’s
oil towns which placed them closest to oil derricks, refineries, and other industrial polluters. Because the impact of environmental contamination fell heaviest on nonwhite communities, it was easier for racist elites to dismiss or overlook the consequences of oil production in the name of region-wide progress.

This dissertation is organized chronologically, beginning with the first Permian Basin discoveries in 1923 and 1926. The first chapter contextualizes oil discovery and industry expansion within the ranching elites’ eleventh-hour effort to save the region’s flagging economy. Chapter two describes the harsh living and working conditions for oil workers in the Permian Basin and the development of a strong sense of community based upon technical expertise and shared triumph over nature. In chapter three, oil companies’ work to mitigate economic risk by building infrastructural networks during the 1930s and 1940s. Exemplified by the development of oil pipelines, the industry worked to make nature predictable, however, oil prices stagnated during the Depression devastating newly-built oil communities. Prosperity returned via government subsidization of the industry, which spurred the growth of a vast pipeline and refining network during World War II. Chapter four discusses the rise of the regional oil processing and petrochemical industry. Odessa became a regional industrial center during the 1950s and 1960s, reinforcing patterns of racial and economic segregation. Chapter five contrasts Midland’s push to become a regional cultural and administrative hub with the industry’s harsh environmental consequences. Chapter six identifies public silence in the face of looming catastrophe. Permian Basin industry expansion in the 1970s, helps to explain a lack of attention to a series of regional public health scares, even in the face of national workplace health and environmental movements. The epilogue briefly narrates the decline of the Texas oil
industry in the 1980s and the stilted, post-industrial conversation about environmental risk and industry culpability.

This dissertation uses the story of Permian Basin boom and bust as a case study to articulate the overlap between labor and working class history, the history of technology, and environmental history. I was inspired by a recent wave of environmental historians such as William Boyd and Andrew Needham, who build on early works by William Cronon, Richard White, and Thomas Andrews to reexamine the history of American extractive industries within larger trajectories of environmental rationalization and capitalistic expansion.\(^\text{12}\) However, even as I highlight the pervasive nature of such systems, I acknowledge the agency of individual workers, landowners, bystanders, and organisms that live within them. I examine accounts of daily workplace experience, oil union records, and environmental health and safety data to demonstrate the central role that oil’s industrial workforce played in negotiating the changing environmental and social costs of oil industry development.\(^\text{13}\)

Although historians have demonstrated the economic, environmental, and political significance of global oil, scholars have yet to effectively link the processes of


\(^{13}\) Sarah Alisabeth Fox emphasizes the role of municipal institutions in making rural spaces and rural laborers expendable for the sake of an idealized narrative of progress through industry. Sarah Alisabeth Fox, *Downwind: A People’s History of the Nuclear West* (Lincoln: University of Nebraska Press, 2014).
technological development and the creation of oil infrastructural systems to broader social histories. In particular, current scholarship has left the perspective of oil workers – those most conscious of and most immediately affected by oil’s economic and environmental impact – out of the narrative of oil industry expansion and technical development. Reversing this trend, I articulate extractive workers’ hard-earned ecological knowledge and demonstrate the ways in which oil workers were both restricted by oil’s economic and technical networks and helped to shape their creation.14 I also engage with others in the emerging field of energy history, connecting oil’s environmental history and technical development to the evolution of popular faith in the free market, a belief that public health was the responsibility of the individual, and widespread disdain for government regulation.15

Through these interventions, I identify the Permian Basin’s importance to the development of the global oil industry, filling three significant gaps in the historiography of American oil. First, while historians of Texas and the American oil industry have long acknowledged that the Permian Basin was one of the most prolific oil-producing regions in the world, the region’s importance to industry technological innovation has been


overlooked. The Permian Basin’s aridity and isolation forced oil speculators to develop new technologies designed for remote desert use. The region was the location for industry experiments in deep-hole drilling, with Phillips Petroleum setting several deepest-hole-dug records in Pecos County in the 1950s. Postwar regional experimentation resulted in new techniques that greatly reduced the amount of water needed for drilling and refining oil. In the 1960s and 1970s, efforts to continue oil extraction in aging oil fields led to the perfection of well injection methods that foreshadowed contemporary fracking technologies in which water, gas, and other chemicals were forced down wells at high pressure to increase production.\textsuperscript{16} Citing the longevity of the region’s oilfields and Midland’s administrative importance to national and global oil exploration, I demonstrate that the Permian Basin was an origin point for such desert oil extraction strategies that were applied industry-wide after World War II.

Second, for the past several decades most oil historians have focused on either the individual accomplishments of exploratory drillers in Pennsylvania and East Texas or the economic significance of fluctuating oil prices on the global market. Those who do engage with oil’s broader cultural and political impact are most concerned with oil extraction infrastructures and national energy consumption practice.\textsuperscript{17} Historians of oil’s

\textsuperscript{16} Well injection and well flooding technologies were developed almost simultaneously with better directional drilling technologies. Directional drills included sensors that told the driller to instantly assess the type of rock encountered and allowed the driller to drill horizontally within the hole. By the 1980s the combination of these technologies with the established practice of “shooting” wells with dynamite or nitroglycerine led to the first hydraulic fracturing methods. John L. Kennedy, \textit{Fundamentals of Drilling: Technology and Economics} (Tulsa: Penwell Publishing Co., 1983).

environmental and public health hazards focus on patterns of contamination near refineries and processing plants.\textsuperscript{18} I use a focus on industrial and infrastructural networks – a framework most recently articulated by Chris Jones – to connect the histories of oil extraction, transport, and refining.\textsuperscript{19} In the American Studies tradition of interdisciplinarity, I combine history with work from geographer Don Mitchell and American Studies professor Brian Black who, together, demonstrate that industrial and residential development are crucial tools for the maintenance and reestablishment of economic and political power.\textsuperscript{20} My analysis of urban geography, regional ecology, and labor migration reveal that a workplace culture of risk taking and belief in personal accountability was fundamental in all three branches of the oil industry. Further, a look into the history of oil industry leadership reveals most oil companies owned and operated oil extraction, transport, and refining operations. Such interconnectivity dictated patterns of industrialization, innovation, and contamination.

Third, with this holistic focus I significantly expand upon the minimal scholarship available on labor activism in the oil and chemical industries and the experiences of employees throughout oil’s many tertiary industries. In fact, refinery workers’ had a long

\textsuperscript{18} I contrast the lack of sustained outrage in the Permian Basin over oil’s environmental and public health consequences against the growing body of scholarship on community activism in response to public health crisis’ brought by oil industrialization. In particular, scholarship detailing outcry and activism among poor black communities along the Gulf coast’s “cancer corridor,” stands in sharp contrast to my story of willful ignorance. Joel B. Goldsteen, \textit{Danger All Around: Waste Storage Crisis on the Texas and Louisiana Gulf Coast} (Austin: University of Texas Press, 2009).


history of direct action in Texas and were important to the establishment of the Occupational Safety and Health Administration (OSHA) in 1970.\textsuperscript{21} In striking contrast, union members were as uncommon as trees in the Permian Basin. I suggest that workplace culture, the processes of industrialization, and human relationships with technology and nature are vital to understanding the development of American grassroots conservatism in the 1970s and the rise of Reagan’s “Silent Majority” in the early 1980s.\textsuperscript{22}

As of 2017 there are 66 active superfund sites in the state of Texas. Most of them house the wreckage of midcentury refineries and petrochemical plants.\textsuperscript{23} As a new oil boom plays out today in the Permian Basin and a polarizing debate about the environmental consequences of oil extraction technologies dominates the popular press, it is more important than ever to understand the origins of the policies, technologies, and industrial networks that frame human energy consumption and shape our extractive future. This project demonstrates the fundamental importance of individual and community complicity to the destruction caused by oil industry development. There are


\textsuperscript{22} Jeff Roache’s forthcoming book on West Texas politics argues that West Texas is a crucial origin point for the grassroots political movement that brought the far-right to national power. I argue that the oil industry was fundamental to the production of this proto-libertarian political system.

no singular villains. Deeply held beliefs can have unexpected social and environmental consequences.

By historicizing oil industry expansion and decline, this dissertation demonstrates that the our current energy crisis was not inevitable, nor is our current path unstoppable. Rather, this project acts a call-to-action for students, legislators, and citizens - as well as scholars – to pay attention to the overlooked, multi-generational consequences of past energy use and development. In the process, it asks readers to look beyond an often-myopic American oil debate that focuses on the consequences of unregulated drilling in seemingly untouched wilderness. Such a discussion ignores both the environmental consequences of oil transport and petrochemical production and the real economic need of communities in oil-producing regions. My examination of the cultural frameworks that drive extractive communities demonstrates the humanity of such populations and pushes us toward a truly two-sided dialogue about the ecological consequences of fossil fuel production and use.
Chapter 1
Finding the Permian Basin

Vast in size, the Texas Permian Basin is dry, largely treeless, and mostly flat. Located atop a desiccated prehistoric sea and a collapsed subsurface mountain range, the region’s aridity and rocky soil do not support abundant vegetation. Most of the Permian Basin is made up of short-grass prairie, interrupted by sparse timelands of ash, juniper, post oak, and mesquite. The two significant exceptions to the region’s monotonous topography are small mountains in Pecos County to the south and stretches of full desert along the New Mexico border. Temperatures in the Permian Basin are mild relative to other parts of the desert southwest, with average highs in the mid 90s and lows rarely dipping below 34 degrees Fahrenheit. Rainfall ranges between ten to twenty inches per
With intermittent rainfall able to support some vegetation and temperatures well within range for human habitability, the Permian Basin’s climate is deceptively harsh. Although the Pecos and Colorado rivers cross the Permian Basin, most of the region’s groundwater is brackish and unfit for drinking. As a result, access to potable water requires either drilling hundreds of feet through unstable sand and rocky soil in search of deeply buried aquifers or transporting mountain runoff hundreds of miles through the desert. Although the land supports a variety of deer, birds, and small mammals, the lack of drinking water remained a persistent deterrent for sustained human habitation until the mid-twentieth century. Despite twenty-first century developments in irrigation and groundwater purification systems, the region has remained the least populous in Texas since Mexican statehood.²

The Permian Basin’s lack of water has dominated descriptions of the region penned by generations of Anglo travelers and residents. Most described the Permian Basin in

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² Before 1800, the Texas population was approximately 1,500 and largely concentrated in and around San Antonio. The population grew quickly in the nineteenth century, driven mostly by Anglo migration from the US into East Texas. The 1840 Republic of Texas Census follows a similar regional pattern. US Census records for Texas begin in 1850. According to the US Census, the population of West Texas is consistently less than the eastern half of the state. Most of this population has been concentrated in the Rio Grande Valley or on the more temperate Edwards Plateau. Henderson K. Yoakum, History of Texas: from its first settlement in 1685 to its annexation to the United States in 1846 (New York: Redfield, 1855); Barnes F. Lathrop, Migration into East Texas, 1835–1860: A Study from the United States Census (Austin: Texas State Historical Association, 1949); Texas General Land Office, First Census of Austin's Colony, 1826 (MS, Dolph Briscoe Center for American History, University of Texas at Austin).
ecologically deterministic terms – as a harsh crucible where only the tough, independent, and the resolute thrive. In the 1880s, tourists and economic migrants crossed the Permian Basin on route to the border city of El Paso from the growing East Texas urban centers of Dallas and Houston. They remarked upon the region’s aridity and lack of viable farmland. In 1970, an oral historian with the Permian Basin Petroleum Museum described the region as “…a wild and distant and somewhat desolate country.” In his 1982 pictorial celebration of West Texas oil development, *Oil in West Texas and New Mexico*, Walter Rundell Jr. defined the Permian Basin by its harsh climate “While surface characteristics of the Permian Basin vary considerably, the entire area is deficient in rainfall.” However, Rundell argued that this climate transformed settlers into the ultimate survivors:

> Before the discovery of oil in the Permian Basin in 1920, the region had all the primary characteristics of America’s western frontier…Pioneers who settled the region possessed the characteristics ascribed to frontiersman by Frederick Jackson Turner: self-reliance, inventiveness, optimism, and individualism. A harsh nature forced them to deal with life realistically.5

This assessment made it into popular fiction. Most recently, horror author Cherie Priest articulated a bleaker assessment in her thriller *Dreadful Skin*, “[Eileen Callighan] had grown up believing in hell in an abstract nightmare way; but West Texas had given her something more concrete upon which to dread the afterlife.” While such environmental

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determinism might seem hyperbolic, these assessments do speak to the importance of climate and geography in Permian Basin culture and economic development.

In this chapter, I demonstrate the importance of the Permian Basin’s long natural history – the region’s arid climate, geological uniqueness, and geographic isolation – to nineteenth and twentieth-century industrial development, human settlement patterns, and political economy. In the late 1880s, after the failure of agriculture in the region, large-scale ranching operations expanded. These ranches fully realized processes of organizing land, life, and space that had been first envisioned by the Spanish government in the 1600s. After Texas joined the United States in the 1840s, the region became synonymous with lawless cowboys, violence, and desolate isolation. Forty years later, rather than holding any particular nostalgia for a nomadic, cowboy tradition, late-nineteenth-century ranchers understood fenced land, clear property lines, and reliable trade networks as a way to hedge against steep economic risks. However, human inability to control aridity and access to water meant that nature set strict limitations upon these efforts to rationalize and quantify land and space. In particular, consistent access to potable water was a central economic and social concern for the region’s ranchers. Local landholders understood themselves as engaged in an ongoing battle against nature – fighting against the region’s harsh environment and natural aridity for economic and physical survival.

I show that this economic system, dominated by large landholders and reinforced by a cultural opposition to nature, was largely uninterrupted by the arrival of oil in the early 1920s. Instead of disrupting existing power structures, oil allowed for the continuation of this hyper-capitalistic, hyper-masculine economy during a time of crisis. By the end of the 1920s, overgrazing and drought made local ranchers dependent upon
royalty payments from oil prospectors who flooded the region. This dependence prevented conflict between established, landed elites and representatives of new extractive industries. Instead, these prospectors quickly blended with the region’s existing ranching culture. In popular folklore, oil workers were described – like cowboys – to be autonomous, independent, hard-drinking risk-takers. Oil administrators were understood as infrastructure builders who worked to minimize risk to their investments. Both joined together with ranchers and agriculturalists in their battle against nature.

Challenges posed by aridity and isolation were compounded by a belief in regional ugliness. This combination made the desire for quick money a defining commonality among successive waves of regional migrants. With neither oil prospectors nor their hired hands interested in starting permanent settlements, the Permian Basin’s late-nineteenth century community structure was led by opportunistic men who manipulated cheap land to reduce risk to their investment and make a quick profit. To this end, drillers used new technologies to further know and control nature and expressed this knowledge through the language of agriculture and masculine mastery. Increasing geological knowledge helped to make subsurface nature more predictable – and helped to unite a transient, extractive community with the region’s ranching elites in the collective hunt for oil.

This chapter draws heavily from a generation of scholarship on the American West that demonstrates the importance of climate and the location of scarce natural resources to the geographic spread of Anglo-American influence. William Cronon, Donald Worster, and Richard White famously describe the ways in which nature set the boundaries of transportation networks and agricultural expansion in the nineteenth and
twentieth centuries. More recently, William Boyd and Don Mitchell have articulated that the specifics of regional geography and ecology influenced the development of twentieth-century labor migration and industrial systems. In the Permian Basin, the trajectory of technological expansion and infrastructure building was defined by the region’s natural topography. The availability of water dictated the location and longevity of settlements. Initially, railroad companies dug deep wells and built towns to provide water for the region’s new steam locomotive system. Later, the size and success of cattle ranches was determined by access to reliable water. In the twentieth century, oil drilling depended upon the ability to decipher subsurface geology and then to move equipment and people through a roadless terrain.

Through a focus on the relationships between geography, economics, and culture, this chapter connects the Permian Basin to a broader history of agricultural and raw-goods production and the development of American capitalism in the nineteenth and twentieth centuries. The expansion of the American cash-crop economy – emerging concurrently with non-renewable extraction in the West – was crucial to the expansion of speculative commerce at the end of the nineteenth century. In particular, the buying and selling of commodity futures – especially agricultural futures – backed the growth of

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8 Cronon, *Nature’s Metropolis.*
large banks and the twentieth-century American financial system. As an infrastructure for oil extraction, transport, and processing developed in West Texas, local oil producers took cues from the cattle industry on how to organize nature to facilitate speculative, economic abstraction. After 1923, such a system was predicated upon a steady supply and demand for oil. The minimization of risk from weather, disease, or human error was a crucial priority. In this context, despite the industry’s rough-and-tumble reputation, the early development of the Permian Basin oil economy should be understood as a prolonged effort to minimize risk – physical, economic, and social – via increasingly sophisticated technologies designed to understand, rationalize, and manipulate nature.

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For 500 years, lack of water has placed the Permian Basin at the periphery of Euro-American expansion efforts. Between 1680 and 1835 Spanish and later Mexican attempts to build a regional agricultural society met with little success. In the early-nineteenth century, the Mexican government offered land and supplies to farmers willing to settle the region. However, persistent aridity largely prevented even subsistence agriculture. Environmental limitations were exacerbated by Apache and Comanche military control over the region. Although they too largely avoided the region, the Comanche fully controlled the Permian Basin by the 1840s.\(^\text{10}\) Texas entered the United States in 1845. After the Civil War, some settlers ignored the boundaries of the Comanche empire, establishing small farms and ranches in the north and eastern parts of the Permian

Basin. However, they found the soil poor, farming unsustainable, and fear of Comanche opposition omnipresent. Most quickly returned home. During the 1870s a series of US military operations out of Fort Stockton and Fort Concho devastated Comanche and Apache populations in West Texas, driving them into what is now New Mexico. This opened the Permian Basin to further attempts at agricultural settlement.11

In the 1870s and 1880s, the State of Texas promoted railroads heavily as an economic boost for the region, hoping that infrastructure would help potential settlers forget about the lack of water. This was part of a larger program in which between 1835 and 1942 the State of Texas gave away approximately 86 million acres – more than half the area of present day Texas – was given away. Much of this land was given as financial capital to railroad companies willing to lead infrastructure-building projects.12 Successful applicants received a grant of sixteen sections for every mile of completed track as well as control over all land within 200 feet of the new railroad.

In 1879, this program was expanded through the “Fifty Cent Law,” in which the State of Texas sold over two million acres of public land, mostly in West Texas, to any comers for fifty cents an acre.13 By selling public land the State of Texas hoped to pay off existing debts, boost the state’s sparse population, and solidify political control. This

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11 According to the US Census, the Comanche population in West Texas alone was estimated to be around 20,000 in the mid-nineteenth century. By 1900 the total Native American population for all of Texas had dropped to less than 500. Paul H. Carlson and Bruce Gasrund, *West Texas: A History of the Giant Side of the State* (Norman: University of Oklahoma Press, 2014), Chapter 4.

12 This land was almost all sold by 1882. Today, there is no federal public land in Texas and very little state owned. This tradition of using land as payment for infrastructure during the nineteenth century depleted state land quickly. Thomas L. Miller, *The Public Lands of Texas, 1519–1970* (Norman: University of Oklahoma Press, 1972).

effort was strongest in West Texas. In the decades after the Civil War, over 70 percent of the population of West Texas was of Tejano or Mexican origin. Fearing a Mexican effort to recapture territory lost in the Mexican-American War, Texas legislators pushed hard to increase the Euro-American population near the border.¹⁴

The Texas and Pacific Railroad, completed in 1881, was the first rail line to come through West Texas.¹⁵ The line, established by federal charter and funded by financier Jay Gould, ran from Fort Worth, near Oklahoma, to El Paso on the Mexican border. The route cut directly across the center of the Permian Basin. The construction of the Texas and Pacific Railroad set off a rail-building boom that would last into the next century.¹⁶

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¹⁵ An 1858 attempt to finance a railroad building project in West Texas ended in failure.
¹⁶ In 1897, a second rail line was built linking West Texas with the Midwest, New Mexico, and Mexico. Called the Pecos Valley Railway, it linked Pecos, Texas in the southern Permian Basin with Carlsbad and Roswell in southern New Mexico. After the
Although the development of this railroad network was an expensive and arduous task in the arid and uninhabited region, by the 1890s railroads owned most of the land in West Texas and by 1900 Texas was ranked first in the US for total amount of track constructed in a single year.\textsuperscript{17}

As the legislature hoped, railroad expansion resulted in significant infrastructural expansion. Railroads extended the construction of telegraph lines begun by the US Army and led to the establishment of a US Mail service. Before the 1880s, regional settlements were limited to a network of US army outposts and small trading depots for the sale of cattle and sheep. Railroads provided an important outlet for ranchers looking to ship cattle to eastern markets and for farmers looking to import supplies. Further, the railroad brought new sustained urban settlement to the Permian Basin. The future oil towns of San Angelo, Colorado City, and Monahans were constructed along the railroad. In 1881, the Texas and Pacific Railway Company established Midway Station, later renamed Midland, halfway between Dallas and El Paso to serve as a repair station and water stop for passing trains. Nearby Odessa was also built on the railroad line. Odessa was allegedly named as an ambitious allusion to the flat grasslands near the Ukrainian agricultural trading center. However, neither Odessa, Texas nor other way-station towns produced goods-purchasing residents as quickly as the railroads hoped.\textsuperscript{18} Established in 1881, Midland did not house permanent residents until 1882. Although the Ohio-based Midland Town Company

\begin{footnotes}
\item[17] Ibid.
\item[18] Ibid, Chapter 4.
\end{footnotes}
bought land in Midland, drilled three water wells, and advertised the town heavily, as late as 1885 the town population remained less than 100. Odessa had a similar story. In 1886, the population was still less than 60.\(^{19}\)

Other railroad companies enticing settlers by offering incredibly cheap land and free supplies. The Texas and Pacific sold some of the land adjacent to its tracks to individual homesteaders under the name the Texas Pacific Land Trust, hoping to generate capital for track construction and build a base population of paying customers. Throughout the 1880s a wave of land speculators advertised the region heavily, hoping to capitalize on gullible settlers. In 1882, the Odessa Land and Townsite Company was formed in Zanesville, Ohio to promote settlement in the Permian Basin. Both the Texas and Pacific Land Trust and Odessa Land and Townsite advertised the region shamelessly as prime agricultural land in newspapers throughout the Midwest. In brochures, the Texas and Pacific Railroad advertised West Texas as a region with an “ideal climate” and contrasted images of the dry, barren “West Texas of the past” with supposedly current images of orderly fields, orchards, and neatly kept farmhouses.\(^{20}\)

Displaced white Southerners took railroads and land speculators up on their offers. Some of these settlers did have success using larger, more sophisticated windmills


and improved irrigation technology, building small cotton operations on the northern edges of the Permian Basin, especially on the Edwards Plateau. More settlers headed even further north to the Texas Panhandle. Others experimented in the cultivation of pecans and a variety of drought-resistant grains. However, water continued to be a problem. Lacking drilling technology to reach the deep Edwards Aquifer or the even deeper Ogallala, few farmers could rise beyond the most basic subsistence. Harry Tweedle of Sterling County humorously recounted regional frustration at the lack of rain, “Only the just and righteous seemed to get all the rainfall. It was up to the unjust and the unrighteous to get some buckets and haul water to their land.”

Others were more pragmatic. Longtime resident J. J. Amburgery described the region’s only appeal, “Land was pretty cheap out there. I bought seven section of school land for $1 an acre.” By the late 1880s, many homesteaders began leaving for less arid farmland in Oklahoma, Kansas, and Nebraska. Even new offers by the Texas and Pacific Railway to haul farm machinery and household goods at no charge could not significantly boost settlement in the region. Odessa Land and Townsite went bankrupt in 1889.

While railroad boosters were unable to ferment a sustained land rush in the Permian Basin, they did provide an economic lifeline for a growing population of cattle ranchers. Certain breeds of cattle and sheep could survive on little water and the region’s hardy grasses. Throughout the 1880s and 1890s, disillusioned homesteaders sold their land to an increasingly wealthy regional ranching elite. Christopher Columbus Slaughter owned

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21 Carlson and Glassrund, *West Texas*, 69.
several million acres in the Permian Basin. He would later become the richest man in Texas at that time through a combination of ranching profits and banking ventures.\textsuperscript{24} The town of Slaughter in Midland County was named in his honor in 1883. John Scharbauer who raised sheep, cattle, and horses in Midland and Ector counties owned approximately 500,000 acres. In 1895, the Reynolds Cattle Company bought 232,000 acres of land in Jeff Davis County, along with land in eight other Texas counties.\textsuperscript{25} Several other families controlled over 20,000 acres each. John Moore Shannon, originally from New Orleans, arrived in the region after the Civil War. He made his money in sheep and owned approximately 30,000 acres in Crocket County and Archer County.\textsuperscript{26} In 1884 Edwin Giddings of Colorado bought the Elsinore ranch that crossed Brewster, Pecos, and Reeves counties on the southern edge of the Permian Basin.

Local rancher William Henry Cowden also profited from drought sales. Cowden established his first herds of approximately 100 cattle in 1883, allowing them free range over the 150 miles between Midland and Carlsbad, New Mexico. By 1885, Cowden expanded his heard to approximately 7000 cattle. Elliott Cowden remembered that even though land was cheap and the region largely unfenced, owners still had trouble providing water for cattle, driving herds for miles across sand hills and scrub to the

\textsuperscript{26} These families joined the University of Texas as the largest landholders in the region. In the 1880s, the university was deeded several thousand acres by the state of Texas to defray the cost of higher education in Texas. The land would be considered largely worthless until the discovery of oil in the 1920s.
Colorado River to drink. In 1886, following a similar trend throughout the state, Cowden and his business partners solved this problem by fencing in their land, digging wells for cattle. They used a combination of fences and enforced property lines to prevent competitor access to railroad lines. Cowden’s operation expanded through the 1890s. When Cowden sold his ranch to his son in 1917, he owned 48 sections (30,720 acres) of land west of Odessa in Ector County. Successive generations of Cowdens would go on to become regional oil royalty and well-known philanthropists.

Wealthy, long-term residents like Slaughter, Scharbauer, Cowden and others made up a generation of nineteenth-century extractive capitalists that set the tone for Permian Basin politics and social order in the twentieth century. Ranching elites attempted to create an ordered, predictable natural landscape, even as three decades of cyclical drought kept ranching contingent upon regional climate. Ranchers constantly developed new land and livestock management strategies to increase control and minimize losses. After the invention of barbed wire in 1884, Permian Basin ranchers fenced in their ranges in efforts to prevent theft and control access to precious water. These ranchers dug wells and drew water up via windmill from deep underground into large watering troughs. Some seeded the land with more hearty, nutritious grasses. The largest ranches experimented with selective breeding programs, crossing longhorn cattle that were more resilient to heat and aridity, with Herefords, and later Angus beef. Others raised desert-bred sheep along with

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cattle, with the heartier sheep acting as insurance against cattle death due to disease or starvation.  

After the failure of land speculation and agricultural booster efforts, these ranchers moved the Permian Basin into a rapidly expanding – and increasingly volatile – American natural resource and agricultural produce economy. Ranchers were major advocates for the region’s new railroad lines. These railroads, coupled with Fort Worth’s rise as a regional cattle processing center in the 1880s, ended the need for long overland cattle drives, reduced the cost of livestock transport to market, and sped up communication channels. However, the distance between the Permian Basin and national centers of commerce and trade remained a barrier for the region’s cattlemen. Nationally, despite a growing urban population that was increasingly dependent upon a growing food transport system, in the late-nineteenth century the US beef industry was volatile. Many ranchers were deep in debt and needed reliable sales from large herds to turn a profit. Cattle death, fluctuating beef prices, and unreliable transportation costs made profits vary wildly from year to year. Profits in boom years had to be exceptional to prevent bankruptcy from several years of no revenue and accrued debt.  

In the Permian Basin, despite new technologies that controlled land, animal life,  

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30 These efforts were financed by European or east coast investors. Payments to investors was a crucial part of ranchers’ calculations when determining land management strategy. For example, the Reynolds Cattle Company was backed by a successive list of banks and wealthy individuals. Such speculation also hedged against the death of herds due to future drought and unexpectedly low cattle prices. See Roger Horowitz, *Putting Meat on the American Table: Taste, Technology, Transformation* (Baltimore: John’s Hopkins University Press, 2006).
and transportation networks, the only real way to protect against drought and water scarcity hinged upon the acquisition of significant amounts of both land and capital. Water remained hard to find and very expensive to transport. Permian Basin ranchers were doubly dependent upon the railroad to ship cattle to market and to get water and other supplies to feed to their herds. The need for information on cattle prices and updated futures trading reports made the railroad—and the telegraph system built by railroad companies—an increasingly vital lifeline. According to Walter Rundell Jr., in Loving County on the New Mexico border a full section of land—640 acres—could sustainably feed only four cattle. If ranchers did not have enough land overgrazing quickly destroyed underbrush, churning up dust and making regrowth slow. Too much cattle offal in a single area produced toxic runoff that leached into groundwater and killed already sparse vegetation. Those ranchers the succeeded in the Permian Basin owned vast acreage, maintained stable access to well water, and knew to employ new technologies to maintain their herds.

These largest landholders were a mix of ex-Confederates, vocal Southern Baptists, and ardent get-rich-quick capitalists. Almost all of them were Anglo transplants to the region. As a result, free-market individualism and personal autonomy dominated regional political life. Oral history interviews with regional farmers and ranchers were laconic and matter-of-fact. While informants explained migration to the region due to the availability of cheap land, they were reluctant to criticize its quality. In a joint interview

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31 A significant exception to this is the story of Daniel Webster “80 John” Wallace, a black cowboy who became a wealthy cattle rancher with his own large landholdings. James M. Smallwood, “African Americans in West Texas,” in West Texas, ed. Carlson and Glassrund, 126.
discussing the movement of ranchers out of North Carolina, Alabama, and Georgia to West Texas, Holt Jowel and Elliott Cowden described their families’ migration from the Deep South, to Fort Worth, Texas, then further west. When asked to speculate as to why so many people came from the South to West Texas, both indicated the easily availability of land and dismissed the region’s environmental limitations. Jowell simply explained that, “You have them [droughts] in Palo Pinto [near Dallas]: you have them everywhere.” Cowden agreed, “They were worse in Palo Pinto I think than they were out here. Anyway, they had more room out here.”

In other oral history interviews, residents described their decision to attempt ranching in the area pragmatically. James J. Wheat remembered his father’s logic for moving to West Texas, “there’s no water, and no rain…I asked him one time [why he came to Loving County, Texas] and he said he just had an idea. That’s all I ever heard him say.” For these residents, doing battle with the elements was acceptable in a place where individuals had full control over their future.

Ranch-owners employed a largely itinerate, almost exclusively male, ranch labor force. This labor force represented a singular source of regional racial diversity. While cultural and economic barriers prevented many nonwhite migrants from gaining ownership over significant acreage in West Texas, ranch hand and cowboy work was open to black, Tejanos, and Native Americans. Approximately one quarter of West Texas cowboys were black. There are several accounts of Seminole cowboys herding cattle on

the Slaughter and Yates ranches. Most residents of the mixed Tejano and Latinx barrios on the outskirts of San Angelo and other towns worked as temporary ranch hands or as agricultural laborers. These laborers, cowboys, and farm hands provided contract-based and seasonal support for sheep shearing, cattle herding, butchering, and an array of other tasks. Wages were low. Work was extremely physically challenging, with workers outside in all climates and during all seasons. However direct opposition to the landholding elite was rare. If conditions were unacceptable, laborers were simply forced to move on to a different ranch.

Because cowboys rarely owned land, they were less invested in the rationalization of rangeland than the ranching elites. However, these workers did understand nature as a force often trying to kill them. Water scarcity, dust storms, heat, and animal violence were personal obstacles to be conquered. Overcoming danger and accomplishing daring feats of strength were mainstays of cowboy folklore. Historian Al Lowman recounts Wes Texas folktales about famous West Texas cowboy Bell Cord Rutherford. In many stories, Bell Cord demonstrated his horsemanship by accepting wagers:

…he and Bell Cord had one gotten thoroughly banged up while broncbusting...Bell Cord…ask[ed] to be given the toughest, meanest mount in the remuda. While others roped and held the animal, he pulled his saddle…swung aboard…never taking his eye off the foreman, as if to say, “Look what I can do.”

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35 Carlson and Glassrund, *West Texas.*
Survival under adverse conditions was a badge of honor that required deep knowledge of land, livestock, and nature. A sense of pride gained through this oppositional relationship was probably a panacea against an inability to circumvent the contingent nature of ranch labor. The region’s lack of vocal opposition to the rancher’s processes of fencing and monetizing land suggests indifference toward a process that benefitted this workforce little.40

Wealthy ranchers and railroads dictated local elections and business development. Until the late 1920s, municipal governments were almost nonexistent. Many Permian Basin counties maintained no designated county seat well into the twentieth century, with all government business and trade conducted in neighboring counties. For example, Upton County and Crane County were not organized – they did not maintain any kind of standing government bureaucracy – until 1910 and 1927 respectively.41 As a result, railroad towns became centers for politics, commerce, and communication. Cattlemen donated land to build trade depots in these towns. They built roads; they hired law enforcement officers; and they were the region’s major employers. As cattlemen sought to thwart the unpredictability of nature, they pragmatically diversified their financial holdings by investing in an array of speculative ventures such as dry goods sales, hotel

40 North of the Permian Basin, Panhandle cowboys did organize in opposition to exploitative labor practices, at times striking or forming cooperative ranches. Lause, The Great Cowboy Strike.
41 Marjorie Gallion, “Crane County Emerged from Tom Green in ’87,” San Angelo Standard Times, July 4, 1976, San Angelo, Texas, 4H. Similarly, James Wheat remembers that his father organized Loving County Texas, which was “the last county organized in the State of Texas.” James J. Wheat and George Clayton, interview, Mentone, Loving County Texas, July 17, 1970, Oral History Collection, Permian Basin Petroleum Museum, Midland, Texas, 1.
management, agricultural production, and residential construction. As Permian Basin counties organized and trade expanded, ranchers and their relatives ran for public office. Many became judges, others county commissioners, others ran for state office.

However, successive droughts in the 1890s, 1910s, and 1920s stalled efforts by cattlemen and railroads to produce swift, top-down industrialization. Many ranches failed during drought periods. Those ranches that held on were heavily mortgaged. Despite some economic diversification, the region’s towns remained slow to develop. Although the largest ranchers survived by further mortgaging their vast holdings and leveraging

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42 Ira Yates, a small landholder in Pecos County, speculated in a variety of industries including dry goods even as he continued his ranching operations. Olien and Hinton, *Wildcatters*, Chapter 1.
cattle for credit, the few remaining farms failed, and smaller ranches were bought out. In 1910, large ranchers owned almost all of the land in the Permian Basin not already controlled by railroad companies.\(^{45}\)

Regional population numbers reflected tough economic times. The 1910 census documented around 24,000 cattle in Ector County, the region’s second most populous county. Two years later, the US census recorded a combined total of only 4,000 people living in combined Ector and Midland counties.\(^ {46}\) By 1920, Ector County contained only an average of nine people per square mile, with a total population of 760 people. Neighboring Midland County was a bit more populous at 28 people per square mile and a total population of 2,449. By contrast, nearby Reagan County was still considered “frontier” at only four people per square mile and a total population of only 377 people.\(^{47}\)

Intermittent drought throughout most of the 1920s kept profits low for even the largest and most diversified operations. The drought deepened again in the late 1920s, keeping populations low.\(^{48}\) George Bentley described conditions working on a large, drought-stricken ranch:

As a youngster I used to haul bear grass…we would take a wagon and team and go

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\(^{45}\) Although these vast properties were broken up by successive heirs, these families continued to control much of the region during the twentieth century, increasing their wealth through oil royalties and contributing to local philanthropy.


\(^{47}\) In contrast, at that time Dallas county contained 210,551 people with 2,451 per mile and Travis county, which included the state capital city Austin, contained 57,616 and 574 per mile. US Census Bureau, “1920,” Historical Census Browser, University of Virginia, accessed June 1, 2016, http://mapserver.lib.virginia.edu/php/county.php.

out in the pasture and gather that choke weed or bear grass and bring it into head- 
quar ters there…and chop it up so the cattle could eat it…they were nice cattle… We 
got up one morning and there was 35 of them down and all 35 of them died that 
day. They called it what is commonly known as yellow jaundice in human beings, 
but it wasn’t a thing in the world but malnutrition.49

This time, drought was coupled with a sudden drop in beef prices, threatening the 
sustainability of even the largest ranches.

Faced with such ecological challenges, Permian Basin cattle ranchers had little 
nostalgia for either a yeoman, agrarian tradition or the fiction of a free-ranging, 
independent cowboy popularized in turn-of-the-century dime novels and silent films.

Since the 1880s, a generation of ranchers saw cattle as the best option for profit in an 
economy with little margin for error. Instead of fearing displacement through change, 
new technologies and scientific developments – railroads, telegraph lines, water 
extraction machinery, and livestock breeding programs – brought modernity and 
potentially new sources of profit to the isolated and inhospitable desert. When the first oil 
explorers arrived in the 1900s, they fit well within existing land use patterns and social 
hierarchies, and they saved ranchers from bankruptcy.

The first significant wave of oil prospectors arrived in the early 1920s and grew in 
number throughout the decade. A few local ranchers did not appreciate the arrival of oil 
exploration. Some landowners did not believe in the oil industry’s long-term 
sustainability and saw oil investment as a waste of money. Some described oil companies 
who did not complete their drilling as contracted. Others sold their mineral rights to oil 
companies for the immediate cash payout. This act of desperation meant that they had to

49 George R Bentley, interview, May 20, 1970, Monahans, Texas, Oral History 
Collection, Permian Basin Petroleum Museum, Midland, Texas, 28.
forfeit any potential profits and control over drilling on their land. Most locals, however, understood oil as a bid for survival.

The droughts of the 1920s made many highly receptive to new ways of making money off their heavily mortgaged landholdings. According to Elliott Cowden, most ranchers welcomed oil with open arms, “…most of them welcomed anything they could get out of an oil company. They felt like it was a gift.” Judge Carl D. Estes had a similar assessment, “Before the discovery of oil there were a number of old pioneers in this country – my father was one of them…This was primarily a ranching country…I don’t think there was a rancher in this country who could have survived without the discovery of oil here.” Payments on drilling leases and oil royalties offered landowners a way to pay off their debts and sustain their businesses at very little risk to themselves.

Although exploratory drilling began in the Permian Basin as early as 1900, it was not until 1921 that the first producing wells were established in Mitchell County, near Colorado City. Over the next decade, leases for “wildcat wells” – exploratory drilling on land not already proven to hold oil – increased in the Permian Basin. As early as 1922, small tanker shipments of crude oil were headed to El Paso refineries along the Texas and Pacific Railroad. Most early oil prospecting in the Permian Basin took place on land either owned by wealthy ranchers or on the remaining state-owned public land in the

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50 For example, James J. Wheat remembers that his father sold most his mineral rights after falling on hard times. James J. Wheat and George Clayton, interview, July 17, 1970, Mentone, Loving County, Texas, Permian Basin Petroleum Museum, Midland, Texas, 16.
Both could more easily afford disruption to their ranching operations than smaller agriculturalists. Early oil prospecting was led by small companies who owned or rented a single drilling rig and employed three or four contracted workers for the duration of the job. If one of these prospectors struck a reliable source of oil, their leasing rights were often bought out by larger companies, who would give them a cut of the profit along with a lump sum discovery bonus. In this way, large oil companies such as the Pennsylvania-based Sun Oil Company and Houston’s own Gulf Oil funded early Permian Basin oil exploration efforts without risking the cost of drilling in an isolated and hazardous region.

The most significant early discovery in the Permian Basin followed this pattern. In 1923 Frank Pickrell of the El Paso-based Texon Oil and Land Company struck oil near the town of Big Lake in Reagan County on University of Texas land. While the Yates field, tapped two years later on land owned by the small-time rancher Ira Yates, would be greater in total oil yield, the Big Lake strike gushed oil across the desert for over a month, generating national news attention and illustrating that there was indeed easily extractable oil in the Permian Basin. The discovery’s heavy press coverage led to the region’s first

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53 In 1839, the State of Texas allocated 221,400 acres of land in central Texas to fund public education. As this land became increasingly valuable the state legislature decided to change the location of the public endowment. In 1876, the Legislature removed Public University Funds land to one million acres in far West Texas deemed to be of little commercial value. However, the discovery of oil on this land in 1924 made the University of Texas one of the wealthiest in the nation. Berte R. Haigh, Land, Oil and Education (El Paso: Texas Western Press, 1986).


55 Martin W. Schwettmann, “Santa Rita: The University of Texas Oil Discovery,” The Texas State Historical Association, Austin, 1943, Oral Histories of the Texas Oil Industry Collection, Briscoe Center for American History, University of Texas, Austin, Texas.
wildcat boom, ballooning the population of nearby Big Lake and causing a rush to secure drilling leases. After 1926 the region, previously known only for large cattle ranches and the harsh climate, quickly became understood as a place to search for wealth within an expanding oil-technological network.

Pickrell named his famous gusher well the Santa Rita No. 1. For the next several decades, he popularized a sensational myth describing his oil discovery that appealed to romantic notions of individual perseverance and the industry’s divine destiny to settle the region. This story was retold in books, industry publications, and the regional press. Images of the well appeared on postage stamps, postcards, and post office murals. Most recently, the scene was reimagined in the opening minutes of the 2013 Hollywood film The Rookie starring Denis Quaid.56

According to the booster literature, for ten years speculators lost fortunes drilling fruitlessly into the Permian Basin's seemingly baron sand and by 1920 everyone knew that the region was a “petroleum graveyard.” Although nobody believed there was oil in West Texas, Frank Pickrell, through his unique knowledge of surface geology, stubborn wit, and pure luck, was going to prove them wrong. Initially, however, Frank Pickrell did not fare any better than his predecessors. With his money running out, on a dark night in

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1921 he climbed to the top of his rig and dispersed a handful of rose petals sent to him by a group of devout Catholic investors (in some versions of this story these investors are a group of New York City nuns). Pickrell blessed the well, christening it Santa Rita in honor of “the patron saint of miracles.” The next day, Pickrell struck oil and the rest, as they say, is history. Told again and again by local boosters, this story connected oil industry expansion to the region’s history of individualistic rags-to-riches gambles, mastery over nature through technology and science, and hyperbolic boosterism.

Some aspects of this story are obviously apocryphal. In reality, almost two years would elapse between Pickrell’s symbolic blessing and the discovery of a profitable amount of oil outside of Big Lake. It was not until May 28, 1923 that Pickrell’s prayers were answered, finally striking oil after 21 long months of drilling. However, the immediate impact of the discovery cannot be denied. According to eyewitness accounts, the roar of gushing oil from Santa Rita No. 1 echoed across the region during the month it took to cap the well. The well produced a lake of oil that could be seen from miles away. Flowing oil blackened the length of the dirt road leading from the town of Big Lake up to the well. Curious spectators traveled from as far away as Fort Worth to watch the big show and savvy entrepreneurs sold both railroad excursions to see the gusher and small vials of “Santa Rita” oil as good luck charms. Pickrell’s company would go on to be

58 “Lucas oil Geyser,” Box 6, Col. No. 60, Warshaw Petroleum Collection, Smithsonian Archives Center, Washington D.C.
very successful in the Permian Basin oil business, making other significant discoveries
and setting several drilling depth records.⁵⁹

This story hints at the challenges that oil prospectors faced, searching for oil in a
largely uninhabited, roadless region without obvious surface signs of oil. Just like
ranching, the establishment of oil operations required systems to thwart regional aridity
and isolation. The Permian Basin’s ancient geological history, responsible for the regions
arid climate, barren soil, and significant oil deposits, defined human development in the
twentieth century. It is ironic that the same natural history that made the Permian Basin so
difficult for human habitation also made it rich in some of the minerals that humans so
desperately desired. The search for profit required a constant battle for subsistence
against a regional climate shaped by the ancient geological forces that created the source
of that wealth.

Lacking many clearly definable surface landmarks, the Permian Basin is named
for the unique deposits of Permian Age sedimentary limestone that lie beneath the
shifting sands.⁶⁰ The boundaries of the Permian Basin change depending on the mapping
organization. While oil companies cite the edges of continuous oil deposits, geologists
will point to the boundaries of particular rock strata, and geographers might look to the
edges of the Llano Estacado plateau. These ambiguous and overlapping definitions all

⁵⁹ Chris Van Wagenen, “Expansion, Cheap Fuel Feed Boom,” Odessa American,
September 20, 1987, Odessa, Texas, 17B.
⁶⁰ Walter Rundell Jr. described the Permian Basin as, “one of the few areas in the United
States whose geological designation has become common geographical usage.”Rundell
Jr., Oil in West Texas and New Mexico, 3. According to Rundell Jr, the Permian Age was
first defined by British geologist Sir Roderick I. Murchison in 1841. Murchison identified
the unique stone formations outside of the city of Perm in the Ural Mountains. Rundell
Jr., Oil in West Texas and New Mexico. See also Samuel D. Myres, The Permian Basin:
describe the same now-desolate region of Southwest Texas that was once an inland ocean.

The origins of these features start in the Cambrian and Ordovician periods between 500 and 600 million years ago when what would become the Permian Basin was under water. Around 300 million years ago the Permian Basin was the shallow, salty Delaware Sea. The sea’s warm waters were home to the vast Capitan Reef, which supported coral, trilobites, algae, sponges, aquatic plants and a variety of other small animal life. Later, fish and crawling insects appeared. Over several million years, dead plant, insect, and animal life collected in the sediments along the seabed. A network of nearby rivers deposited red clay into the sea. The clay mixed together with dead plant matter, gravel, and sand, pressed with increasing force against the limestone rock lining the seabed. As heat and pressure increased, this mixture was slowly transformed into deposits of coal, crude oil, and natural gas trapped within limestone rock strata. Over time, silt and mud slowly filled the Delaware Sea as the water rose and fell several times, leaving behind large deposits of salt. Over the next several million years, salt, minerals, and hydrocarbons were trapped in uneven pockets beneath the surface of the Permian Basin, anywhere from a few hundred feet to five miles below ground.

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Little knowledge of this long geological history existed when wildcatting began in the Permian Basin. Until the early-twentieth century, most oil explorers used a combination of surface landmarks, visible oil seeps, and sensory input such as the smell of sulfur or crude oil to decide upon drilling locations. As one early-twentieth century geologist put it, many prospectors made the mistake of focusing on, “above-ground rock formations and speculated that there might be folds or traps underground where oil might be found.” Some attempted to professionalize analysis of surface clues, calling the practice “creekology.” Others used more exoteric methods such as divining rods, séances, or mediums who claimed to channel spirits to gain the power to smell underground oil. However, dumb luck was a common feature in early oil discoveries. The earliest US oil discoveries in Titusville and Oil City, Pennsylvania were the result of luck and fortuitous drilling for salt brine. Tellingly, many of these early prospectors advertised their services as an “art. Others compare it to tracking live game. For example, early-twentieth century oil prospector Chauncey A. Moon titled an advertisement pamphlet promoting his wildcatting skills, “The Art of Locating Oil.”

Oil discovery professionalized quickly in the early-twentieth century. By 1915 the University of Pittsburg was offering the first US petroleum engineering degrees. By the 1920s, a new generation of academically credentialed geologists was rising to

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63 Frehner, *Finding Oil.*
66 Ibid.
prominence in the industry. However, these early geologists continued to focus on analysis of surface rock to predict the presence of oil. For example, if rock was porous, it was considered likely that oil was below. Later on, the practice of taking core samples—rock samples extracted from within the drilling hole—made this analysis more accurate. Credentialed geologists became increasingly common in large oil companies who were opening new headquarters in new oil refining and transport centers along the Gulf Coast.68

By contrast, in West Texas during the 1920s, most wildcatters continued to use simple trial and error to hunt for oil. Many saw professional geologists as no more skilled than an experienced prospector. In an oral history interview, George T. Abell stated that the Marland Oil Company and the Gulf Oil Company conducted the earliest geological surveys in the Permian Basin. These surveys examined the surface only and, “really missed a lot.”69 Despite a lack of hard evidence that oil existed below the Permian Basin, successes in other parts of Texas, including the famous Spindletop oil strike in 1901 near Beaumont, coupled with landowner reports of oil bubbling up from the ground on their property spurred a small but steady wave of exploratory efforts in the Permian Basin.

Between 1923 and 1926 an array of small drilling companies made big discoveries in increasingly far-flung locations. Wildcatters drilled deeper and deeper as they realized that oil in the region lay much farther below that surface than expected.

68 However, during the 1920s and 1930s there were still many unknowns in petroleum geology. For example, exactly how and why petroleum was made was still a debated topic well into the Depression. H. C. Miller, Function of Natural Gas in the Production of Oil (New York: American Petroleum Institute, 1929).
Frank Pickrell’s Santa Rita No. 1 in 1923 struck oil at 2,875 feet. In 1925, the Continental Oil Company struck oil in the Howard-Glasscock field at a depth of 2,081 feet. That same year, the Republic Production Company struck oil near the town of McCamey at a depth of 2,100 feet. In 1926, the equally deep Hendricks Field was discovered on the Hendricks family ranch in Winkler County. Also in 1926, the giant Yates field was discovered by the Mid-Kansas Oil and Gas Company at the much shallower depth of 1,310 feet. Both the Yates and Hendricks discoveries were particularly isolated. According to Olien and Olien, “Both fields, however, had the liability of being in regions that were isolated, bleak, and underpopulated even by West Texas standards.”

Located in counties with populations of less than 100 people, these discoveries were very far from railroads, pipelines, refineries, and oil markets.

Oil speculating was an expensive gamble. According to the American Petroleum Institute, 25,623 US wells were dug in 1925. 16,559 produced oil. While this indicates that 62 percent of wells produced oil, these numbers do not indicate whether or not that oil was produced in profitable quantities. Nor does it indicate the extreme cost of a single drilling operation, which at approximately $22,000 was almost sixteen times the average individual income in 1925.

Oil speculators used stories of individual luck and

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71 For example, the Hendricks field was approximately twenty miles from the Texas and Pacific Railroad. Railroad Map, Grizwald Map Collection, Permian Basin Petroleum Museum, Midland, Texas.

perseverance, such as the Big Lake discovery, to convince people to fund highly risky oil drilling operations. In direct mail advertising, joint stock companies used the rhetoric of masculine bravery, protestations of scientific knowledge of land and geology, and assurances of the power of new technology to conquer nature to explain how they would persevere over the harsh climate and isolated locations. Instead of employing spiritualists or using divining rods to find oil, prospectors described the reams of statistics and maps at their disposal.\textsuperscript{73}

Such oil boosters were backed by a popular literature on oil that made drilling sound both extremely easy and the result of an exciting big game hunt. During the early-twentieth century, oil product advertising, oil investor literature, popular magazines such as \textit{McClure’s}, and children’s books, described oil as existing in underwater lakes. Extraction was similar to turning on a water tap or sucking up liquid through a straw.\textsuperscript{74}

Oil gushers were natural phenomenon on par with Old Faithful or the Grand Canyon and rail tourism companies offered people the opportunity to go watch them flow. At the same time, oil was animistic, mysterious, unpredictable, and sneaky.\textsuperscript{75} A 1935 pamphlet

\textsuperscript{73} Hugh S. Taylor, “The ABC’s of Science in Oil Recovery,” American Petroleum Institute, 1927, Box 6, Collection 60, Warshaw Petroleum Collection, Smithsonian Archives Center, Washington, D.C.; Pamphlets, Folder ‘Prospector Advertising,’ Texas Oil Industry Scrapbooks Collection, Briscoe Center for American History, University of Texas, Austin, Texas.


\textsuperscript{75} George Pattullo, “Chasing the Rainbow,” \textit{The Saturday Evening Post}, May 29, 1920.; Southern Pacific Railroad, Advertisement for Lucas Oil Geyser, Box 6, Collection 60, Warshaw Petroleum Collection, Smithsonian Archives Center, Washington, D.C.; The
from the API described the conclusion of the hunt for oil, “Just as the modern meat-packing plant utilizes every part of the butchered animal, so the modern refinery uses every part of crude oil, including even the odor.”76 In such documents, nature – embodied in flowing, subsurface oil – was anthropomorphized and through the power of science, could be harnessed into a quantifiable, understandable resource. Speculators wanted the general public to understand oil prospecting as humanity taking control over what was previously uncontrollable.

Some investors probably made a tidy profit through such speculative ventures. However, direct-mail advertisements from prospectors to West Texas landowners argued that the local landowners benefited most from oil exploration.77 Most oil companies leased the right to drill on a particular property rather than buying the land outright. This sheltered oil companies from the risk of owning property that would inevitably become useless for oil production. By the time of the Santa Rita discovery, the American oil industry had an established precedent for landowner compensation. In a standard oil lease, the landowner allowed a company the exclusive right to drill on their land for a set amount of time.78 The lease was considered lapsed if a leaseholder failed to begin drilling

77 “Sentinels of Gusher Wealth,” “Surveys about 24 Miles North of Torrecillas,” Folder ‘Oil Advertisements,’ Folder 3 Box 31367, Oil Scrapbooks, Briscoe Center for American History, University of Texas, Austin, Texas.
within the specified period. If oil was found, the landowner was given a percentage, usually 12.5 percent, of the profit earned from that oil as well as a cash "bonus" sum.79

Oral histories described several situations in which, as the region’s largest landowners, ranchers were able to demand whatever prices they wanted from wildcatters looking for drilling leases. While court disputes between Permian Basin landowners and oil prospectors demonstrate that this system did not always work as advertised, oral histories suggest a collective memory that it did benefit most.80 This assessment is backed up by analysis of national production data which reveals the hefty size of oil royalty profits. In the early 1930s, the average production from US oil wells was eight barrels per day. If a landholder had only four producing wells on their property, they could expect to receive approximately $949, or $14,230.99 adjusted for inflation, per year in oil royalties.81 Sometimes royalty payments were larger depending on the lease location and the value of the property. For example, more was paid if the lease was located within a

81 In 1931, the worst year of the Depression, oil was priced at $.65 per barrel. This would result in a royalty profit of approximately $237.25 per year in 1931 dollars. In 2017 dollars, this would come to $3,802.29. Many West Texas wells were financed using joint stock companies. Whatever company owned the extraction equipment used in the well was considered the well operator and typically received the most equity in the well. The operator was legally considered the owner of the well, however, the profits were divided among several parties. Older wells attached to pumps produced on average less than one barrel per day, making the profits for the individual stakeholder even smaller. Oil price data from *API Statistical Bulletin 1930-1940*, American Petroleum Institute, Special Collections, Hagley Museum and Library, Wilmington, Delaware.
town or city limits. This system allowed landowners to keep control over their land and return it to ranching or farming if oil was not discovered.

Early Texas oil exploration produced a frenzy of speculation that led to wasteful extraction and contributed to landholders’ belief that the industry wouldn’t last long in the region. From the late 1850s until the Great Depression, this frenzy was encouraged by the legal framework that governed oil extraction, a set of laws called “rule of capture.” This system developed distinct from laws governing mining operations because oil does not remain stationary within the earth. Instead, rule of capture laws were derived from laws governing common natural resources such as water or resource extraction in commonly held geographies such as fishing rights in international waters. Traditionally, “mineral rights” described the right to any valuable material – excluding water – found directly below the boundaries of a particular property. However, because oil is a liquid, it was impossible to know if the oil being extracted originated within the boundaries of surface property lines. For this reason, instead of limiting extraction, rule of capture dictated that a landholder or contracted oil drilling team had the absolute legal right to as much oil as they were able to extract or “capture” while still drilling from within the boundaries of a single property. Under this system, allowable oil extraction did not correspond to the

82 Oil Leases, Folder ‘Cummins Area Lease Assignments and Misc Ector County TX 83-021,’ Box 3, C. J. Red Davidson Collection, Permian Basin Petroleum Museum, Midland, Texas.

83 Fundamental to basic human survival, water has its own complicated legal history. Water law is very different from state to state. For example, in Texas water that runs through or below a particular property is considered the private property of the landholder. Mark Somma, “Local Autonomy and Groundwater District Formation in High-Plains West Texas,” *Publius*, 24: 2 (1994), 53-62.
circumference of that property and there was no restriction on the amount of oil someone could take from a single well.\textsuperscript{84}

In the early 1930s, this system would lead to a massive oil surplus, global oil glut, and the temporary collapse of Texas oil operations. However, in the 1920s, rule of capture fit easily into popular understandings of appropriate, masculine business acumen. Under rule of capture, the possible value of a particular well had no direct correlation to the size of the property it was built upon. In the popular imagination, rule of capture rewarded only the hardiest and most determined men willing to risk it all, rather than simply giving oil to those wealthy enough to own land.\textsuperscript{85} Through a battle with the unknowable mysteries of nature, oil wildcatters sussed out the location of oil and through the arduous and dangerous process of drilling, made a significant profit.

Before World War II, rule of capture solidified – rather than displaced – the control of large ranchers in the area. Because so few people owned so much land, single landholders could own the rights to entire oil deposits, with oil companies bargaining with landholders for only a single small portion. Ira Yates and other landholders recorded that they fielded competing bids on royalties or received lease payments from several


\textsuperscript{85} Beginning in 1917, the Texas Railroad Commission was given more power to regulate the oil industry. First given the power to force interstate oil pipelines to become “common carriers” - to carry oil from any company willing to pay - the RRC soon began enforcing well spacing laws. Their power increased dramatically during the 1930s. After chaos caused by rampant overproduction in 1929 and 1930, the State of Texas and Federal legislators significantly diminished the importance of rule of capture laws. As prices fell, due in part to unregulated extraction in the East Texas oil field, the Railroad Commission was put in charge of regulating allowable amount of oil to be extracted from every well in the state. Childs, \textit{The Texas Railroad Commission}. 
different wildcatters. \textsuperscript{86} Yates’ story is illustrative. In 1915 Ira Yates traded his Rankin County grocery and dry goods store for 16,640 acres of failing ranchland in southern Pecos county. Yates proceeded to buy more land over the next several years, expanding his cattle holdings and sinking into increasing debt. In 1926, fearing foreclosure, Ira Yates offered his land for oil drilling. Drilling began that year under a partnership between the Mid Kansas Oil Company and Transcontinental Oil. They struck oil on October 28 and made Ira Yates and his wife instant millionaires. \textsuperscript{87} Before his death in 1939, Ira Yates personally negotiated dozens of favorable lease agreements with the nation’s largest oil companies, including Magnolia, Humble, and Phillips, Petroleum. \textsuperscript{88}

While Yates’ story was not the norm, landholders with less productive properties also broke their land up into sections, allocating separate, small leases to different oil companies. \textsuperscript{89} According to an oral history interview with E. N. Beane, savvy landholders in Crane County took this a step further, requiring oil companies to buy separate leases for groundwater wells, on top of their existing oil leases. \textsuperscript{90} Many of the largest ranchers

\textsuperscript{86} Myres, \textit{The Permian Basin}, Chapter 9.

\textsuperscript{87} Ira Yates donated 152 acres to the boomtown of Redbarn, which sprung up on his property, in an effort to house the dozens of prospectors who arrived after the initial boom. Samuel D. Myres, \textit{The Permian Basin: Petroleum Empire of the Southwest} (2 vols., El Paso: Permian, 1973, 1977).

\textsuperscript{88} By 1927 55 major oil companies had leased over two million acres of land in Pecos County. H. S. Hunter, “Pecos County Oil Lands Find Unprecedented Sale,” \textit{El Paso Herald}, December 8, 1927, El Paso, Texas, 1.; As of 2009 the Yates Field, which had produced over one billion barrels of oil, covered over 26,400 acres. As of 2017, the field still produces oil.

\textsuperscript{89} James Wheat of Loving County remembered that his father broke his suffering farmland into five acre sections with the plan to lease rights to different oil companies on each section. James J. Wheat and George Clayton, interview, July 17, 1970, Mentone, Loving County, Texas, Oral History Collection, Permian Basin Petroleum Museum, Midland, Texas, 3.

\textsuperscript{90} For those that did not drill their own water wells, a Mr. Melton sold water by the barrel. E. N. Beane, interview, June 1970, Crane, Texas, Oral History Collection,
in the Permian Basin, such as the Scharbauers and the Cowdens, found significant oil deposits on their land in the 1920s and 1930s. This made them incredibly wealthy and provided a safety net for the risks inherent in the cattle business.\textsuperscript{91}

Oil discovery resulted in a massive regional population boom. However, this influx of new workers was slow to disrupt established economic hierarchies. Beginning in the mid 1920s, the Permian Basin experienced a surge in regional human population that would continue through the end of the twentieth century, with thousands traveling to the Permian Basin for work in oil drilling and adjacent industries. According to the US Census, the Permian Basin’s total population tripled between 1920 and 1930, jumping from 134,475 to 333,491.\textsuperscript{92} The towns of Kermit, in Winkler County, and Snyder, in Scurry County, both experienced noticeable spikes in population during the late 1920s.\textsuperscript{93} E. N. Beane described that Crane County came into existence due to oil expansion, “In the summer before this oil was started out here there was only eight qualified votes in


Crane County.” Oil arrived in June 1926 and the county was organized in September 1927.  

With transportation between the region’s oilfields and larger industrial centers such as El Paso or Houston extremely limited, the region’s small towns became vital oil supply and administrative centers. Fort Stockton and Iraann, adjacent to the Yates field in Pecos County, experienced massive growth during this period. Similarly, San Angelo became a local steel supplier and oil tools manufacturing center. Odessa and Midland saw sudden jumps in population and industry importance.

Almost all oil work was seasonal, with the transient labor force moving from job to job across the region – and across the country. Throughout the 1920s, many ranch hands moonlighted in the oil industry, attracted by the easily available work and relatively high

wages. 96 This population fused an established cowboy culture of opposition to nature, physical risk, and individualistic morality with oil's emphasis on technological efficiency, high-stakes gambling, and capitalistic speculation. Looking back on his time working in the West Texas oilfields, singer Slim Willett put some of these sentiments into song, “I’d rather have me a young girl or two and a job on a rig I can quit when I choose.” 97 The unstable, transient nature of the work made it rare for oil employees to settle long enough to buy property, develop stable relationships, or engage in political action. Such a combination allowed the oil industry labor structure and class hierarchies to easily assimilate into the region’s established ranching economy made up of landed elites and itinerate labor. 98

According to oral histories, folklorists, and the popular press, the generations of young men who worked on the Permian Basin’s early oil rigs were pragmatic, had little education, and often violent. Many were driven by the desire to escape debt peonage in East Texas, some wanted better paying jobs, yet others were simply looking for adventure. Few were interested in settling down in a single location. Dee Locklin

96 F. Arthur Stout remembered that he received $14 per day working on an oil rig in 1920. F. Arthur Stout and Joseph W. Graybeal, interview, Oral History Collection, Permian Basin Petroleum Museum, Midland, Texas, 14.; Folder ‘Human Resources: Wages and Salaries General 1883-1998,’ Box 2.207/E46 Exxon Mobil Historical Collection, Briscoe Center for American History, University of Texas, Austin, Texas.; Boatright, Tales from the Derrick Floor.


98 Arthur Stout and Joseph Graybeal described oil camps as “wild towns” with a “certain class of people that followed the boom.” Stout and Graybeal, interview, 18.; E. E. Brackens described a fight that began in a diner and escalated to destroy both the whole diner and the nearby dry goods store. E. E. Brackens, interview, July 16, 1970, Wink, Texas, Oral History Collection, Permian Basin Petroleum Museum, Midland, Texas, 9.; See also Gerald Lynch, Roughnecks, Drillers, and Tool Pushers: Thirty-three Years in the Oil Fields (Austin: University of Texas Press, 1991).
described these men, “And of course many of the people, at least in the past, they were transients and could pull up and leave a town and not suffer from it at all….”

For example, colorful cowboy personality Bell Cord moved between working on ranches and roughnecking in the oil fields when ranch jobs were scarce. His songs described the movement of much of the cowboy lifestyle into the oil fields - drinking, fighting, and gambling in between jobs. Others were young men, many in their late teens, who had heard about the recent oil strikes and hoped to cash in on high wages. Folklorist Moody Boatwright described the people who first worked in oil as very specific kind of person, “The workers – the drillers, the tools, the roughnecks, the roustabouts, the pipe liners – were necessarily wanderers, for it required many fewer men to maintain a field than to develop it.”

The migration of people to West Texas for oil jobs meshed well with an established tradition of land speculation and homesteading. The first Americans in Texas arrived seeking cheap land under the auspices of the Mexican government. In the 1880s and 1890s, land speculators worked hard to convince people that West Texas agriculture

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101 Mody C. Boatright, *Tales from the Derrick Floor: A People’s History of the Oil Industry* (Lincoln: University of Nebraska Press, 1982), 121. Such an assessment was widespread. 1924 correspondence between Sun Oil executive J. N. Pew to his brother expresses frustration at the violent, unreliable men who work on oil rigs. Letters, folder ‘Dallas, Texas J. Edgar Pew 1924,’ Box 109, Series 1F Administrative Interoffice (Geographical), Sun Oil Company Records, Hagley Museum and Library, Wilmington Delaware.
was a lucrative gamble. The state attracted a different wave of extractive opportunists after the Spindletop oil discovery in 1901. Throughout the 1910s and 1920s, boosters spread the word nationally that there was ample cheap land and lucrative jobs to be had in Texas. In the following decades, belief in Texas as a land of economic opportunity became part of the local folklore. For example, Clarence “Flappy-Jaw” L. Bryan, who was born in Georgia and worked for several decades in a Magnolia Oil machine shop, remembered his parents receiving a letter in 1917 saying, “In Texas the money grows on trees. A man can get a job working twelve hours a day and make more money in a day than he could in a week in Georgia.” His family moved to Port Neches, Texas that same year.

Oil extraction imagery, vocabulary, and worksite culture was strikingly similar to the established ranching system. Both industries employed a largely itinerant, seasonal workforce that moved from ranch to ranch and drill site to drill site. Both groups developed deep knowledge of land, geography, and technology through personal experience. Due to lack of good roads, both cowboys and oil workers labored in almost complete isolation until the job was done. Ranch foreman and head drillers held significant power and autonomy on the job. The boss’s word was final, oversight was minimal, and personal knowledge of geology and geography was vital to success. All relied on the material utility of nature – be it grain, cattle, or carbonized sealife – to make

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102 Elwood Farms, “South Plains Opportunities,” October 1934, Lubbock Texas, Southwest Historical Collection, Special Collections, Texas Tech University, Lubbock, Texas.
103 “Men Who Make Magnolia…” Magnolia News, December 1950, 14, Box 2.207 E224, EXXON Mobil Collection, Briscoe Center for American History, University of Texas, Austin, Texas.
a profit. However, just as agricultural operations were susceptible to flood or drought, it was understood that nature often existed outside the control of oil drillers, with both uncooperative geology and inclement weather affecting potential yields.\textsuperscript{104}

The emerging economic structure of the West Texas oil industry mirrored the cash crop agricultural system in important ways. Governed by the powerful Chicago Board of Trade, selling agricultural and commodity futures was big business in the late-nineteenth century. Under this system, commodity prices were agreed upon in advance of delivery and, in theory, selling futures stabilized prices in an industry made volatile by the unpredictability of nature.\textsuperscript{105} In reality, accusations of grain transport monopoly and price fixing dogged the industry. The oil industry sparked similar outrage. Bought and sold on a national stock exchange, oil prices were based on oil grade, which was determine by, among other things, the gravity and amount of sulfur in the oil, and oil location.\textsuperscript{106} As in agricultural production, a central oil industry goal was to avoid sudden increases or drops in prices, which could lead to financial panic and market recession. Also similar to agricultural production, oil companies were largely unsuccessful in preventing sudden


\textsuperscript{105} For example, if all wheat crops fail and there is a sudden shortage of wheat, the futures market prevented prices from suddenly spiking, which would cause a bread shortage and social panic.

\textsuperscript{106} To illustrate regional centrality to this market, the North American benchmark price is based on the price of West Texas Intermediate (WTI), also known as Texas Light Sweet oil and the grade of oil most common the US refineries. For more on oil trading and the industry’s legal history see Joseph Shade, \textit{Primer on the Texas Law of Oil and Gas}, 5th Edition (LEXISNEXIS, 2013). See also John L. Kennedy, \textit{Fundamental of Drilling: Technology and Economics}, Tulsa: Pennwell Publishing, 1983, Hagley Museum and Library, Wilmington, Delaware.
price fluctuations by either predicting or controlling the available supply of oil.\textsuperscript{107} Large oil companies, first Standard Oil and later Gulf Oil and the Texas Company, developed integrated oil empires, working to manipulate supply and cut production costs by controlling oil transport and distribution.\textsuperscript{108}

In the Permian Basin, a region whose main industries were the production of cotton, sheep, and cattle, locals were well versed in the pros and cons of a speculative commodity system. Moving from an agricultural to a petroleum economy simply meant shifting gears from buying and selling on one market to another. It did not require a conceptual reorientation of how people understood the land or economic exchange, only the acquisition of relevant technical knowledge.

Connections between oil and agriculture appear in the language workers and prospectors used to describe the oil industry, further suggesting that the jump from agriculture to oil was not a far one. Workers used language, terminology, and imagery drawn from ranching and agriculture. Advertisements described wealth from the “oil patch” or available work in the “oil fields.” In the local press, regions with


extensive drilling operations were notable for their “forests” of oil derricks. After extraction, oil was stored on “tank farms.” Such language referenced cultivation and agrarian fecundity. In particular, stock certificates issued for Texas oil companies imagined their efforts in agricultural terms. In one certificate from the Buffalo Texas Oil Company, derricks dotted a rolling hillside under a picturesque sky. Farmhouses and barns could be seen, small in the distance. On another certificate, derricks rose between curtains of bailed grain. While these advertisements played upon nostalgia for a pastoral, yeoman citizenry that never truly existed, they were also the product of an agricultural focus that did not disappear with the advent of a new industry. Rather, the language of the older ranching and agricultural industries were grafted upon the new. Such ads depicting human control over nature echoed earlier ads for agricultural settlement and land speculation in West Texas. As railroad trading posts were replaced by oil machine shops and land speculation became oil speculation, everyone continued to speak the same language.

Simultaneously, the industry’s roughnecks, drillers, and tool pushers used language that linked drilling to animal capture and oil discovery to regional conquest through the hunt. Common oilfield slang made a cultural connection between cattle wrangling, masculine mastery over land, and the daily processes of oil extraction. When

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110 Advertisements and Flyers, Folder ‘Texas Oil Companies Collection 96-088 Promotional Material 1922,’ Box 2.325/AA14b, Maps Collection, Briscoe Center for American History, University of Texas, Austin, Texas.
wells did not cooperate, they “kicked.” Out of control wells were “wild wells.” Gaining control over an out of control gusher was called “capping” or “killing” a well. Suggesting a traditionally masculine understanding of male industry and feminized nature, the wells themselves were often named after women. This is exemplified by Frank Pickrell’s Santa Rita No 1 and the Wild Mary Sudik No. 1 - a 1930 Oklahoma gusher well that gained international fame for its “untameability.”

With this man-verses-nature mentality, oilmen reinvented the cowboy's iconography of masculine mastery over living nature and the symbolic taming of local geography for a new industry.

Such a perspective framed the way oil drillers understood the oil industry’s increasingly sophisticated drilling technology and oil detection science. Just as Permian Basin ranchers were quick to adopt new technologies and diversified land management strategies, oil explorers were quick to experiment with new technologies. In the early-twentieth century, oil drilling was the job of a two-man team. Driller and machinist worked long hours alone in the desert, operating a cumbersome and slow cable tool drill. One of the most significant developments in oil technology was the invention of the rotary drill. The rotary drill was first patented in 1845 and rose to fame in 1901 as the

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112 According to midcentury engineers and industry historians this design “has not changed significantly in 75 years.” The story of the twentieth century oil industry is defined by the switch from cable tool to rotary drilling technology. J. E. Brantley, History of Oil Well Drilling (Houston: Gulf Publishing Company, 2007).
drill that produced the well-known Lucas Gusher at Spindletop. However, it was expensive and did not dominate the industry until the mid-twentieth century.\textsuperscript{113} Permian Basin drillers adopted the rotary much earlier. Rotary drills were lighter, faster, and more efficient than cable tool drills. These provided important advantages in the Permian Basin’s roadless terrain and deeper wells.\textsuperscript{114} By the 1930s, most Permian Basin wildcatters had invested in a rotary drill.\textsuperscript{115}

The theory behind rotary drilling was relatively simple. A rotary drill was first powered by a steam engine, later by an internal combustion engine burning fuel oil or diesel. The engine rapidly turned a hollow pipe with a serrated bit attached to one end. While cable tool drills used a cantilever system and gravity to slowly punch a hole through subsurface rock, the rotary drill bored a hole by rotating a drill bit pressed hard against the rock, using friction to drill a bore hole. As the bit sank into the expanding hole, “drilling mud” – high pressure water mixed with clay and other chemicals – was pushed through the drill pipe. This pressure forced rock cuttings and other debris to the surface, allowing the drill to sink into the hole. In order to change direction, the drill was turned within the hole by hand using a man-sized lever on the base of the drill. When a drill pipe needed to be added as the hole got deeper or removed due to a break in the pipe,

\textsuperscript{114} Rotary technology was first introduced in the late-nineteenth century. However, because the rotary was more complex and more expensive, as late as the late 1940s cable tool still outnumbered rotary in most of the United States. It would take until 1951 for rotary to outnumber cable tool drills. \textit{History of Petroleum Engineering: A Publication of the American Petroleum Institute}, API, 1961, Special Collections, Hagley Museum and Library, Wilmington, Delaware.; “Rotary Drill to Fight Cox Well’s Sand,” \textit{El Paso Herald}, November 27, 1920, El Paso, Texas, 5.
the pipe was drawn up out of the hole by pulling on a network of pulleys anchored to a cross beam midway up the derrick. Once the drill struck oil, indicated by a rush of oil up the drill pipe, a hollow casing pipe was lowered into the hole, a pump was attached, and controlled oil extraction began.116

Although quicker and more versatile that cable tool drills, financing a typical 1920s rotary drilling outfit was much more expensive. Necessary tools consisted of a boiler, a steam engine, drawers, a rotary machine, a variety of pumps, drill pipe – cut into 60 feet lengths to be screwed together as well depth increased – pipe casing, and other tools. Derricks, originally made of wood but increasingly made of steel after 1930, were on average between 72 to 82 feet high depending on well depth. Individual drill pipes were typically 4.5, 6.5, or 8 inches in diameter. Between two to five workers had to be paid for their services.117 While initially drillers slept on the derrick floor or in hastily constructed tents or cabins near the drilling site, oil companies had to provide food and water for anywhere from 30 to 100 days of drilling.118

117 Later, with the advent of more sophisticated drilling equipment, a five-man team became more common. According to API journalists, during the 1920s and 1930s, a two or five man drilling team was most common at a single well. Photograph Album, Box 113, API Photo and Film Collection, Collection 71, Smithsonian Archives Center, Washington, D.C.; Brantley, “Review of Drilling Methods,” History of Oil Well Drilling.
118 Well into the twentieth century, drilling teams required a wagon and horses or oxen. Bad roads meant that early automobiles available in the 1920s could not handle the overland journey pulling heavy drilling equipment. By the 1930s horses had largely been replaced with automobiles to transport equipment to the drilling site. During the 1920s and 1930s, it took between 30 to 100 days to drill a well between 2000 and 3000 feet. E. N. Beane, interview, June 1970, Crane Texas, Oral History Collection, Permian Basin Petroleum Museum, Midland, Texas.; By the 1960s, this number had been cut to
Permian Basin wells were unusually far underground, with oil deposits surrounded by limestone and sandstone rock. While a relatively soft stone, these materials were much harder on drills than the shallower wells dug into East Texas mud or Gulf Coast sand. In the 1890s, few American wells went below 2,000 feet and the majority were less than 1,000 feet. By the early 1930s most wells were 2,500 to 7,000 feet on average. Deep wells were expensive. In 1930, drilling cost per well in the United States was approximately $22,000.\footnote{Brantley, “Review of Drilling Methods,” \textit{History of Oil Well Drilling}, 7.} In the Permian Basin, this price tag increased due to a variety of factors such as, “the distance of the well from available sources of power, supplies, market, etc.”\footnote{Brantley, \textit{History of Oil Well Drilling}, 38.} Other factors included the type of rock formation penetrated, the age of the drilling system, the kinds and quantities of casing pipe used, whether or not drillers experienced problems with cave-ins, the presence of water or gas in strata, cost of labor, fuel, water, and other equipment. Deeper well depth and the need for expensive new drills, coupled with the high cost of transporting oil first to the region’s limited rail lines and then to Gulf or East Coast refineries, meant that oil prospecting in West Texas was a uniquely capital intensive gamble.\footnote{Olien and Hinton, \textit{Wildcatters}.}

With such pressures in mind, a need to reassure hesitant investors helps to explain the emphasis on control and mastery in oil booster texts. Control over nature was directly related to profit. The most immediate ways for wildcatters to mitigate financial risk was approximately 30 days to drill a 3000 foot well and put it on production. Brantley, “Review of Drilling Methods,” \textit{History of Oil Well Drilling}, 7.

\footnote{Brantley, \textit{History of Oil Well Drilling}, 38.}
through better oil detection techniques and decreased drilling time. According to one industry insider, most oil drillers understood that, “improvements in oil-finding techniques are tending to reduce both the number of ‘dry’ holes drilled and the financial loss they entail.” The switch from steam to electric powered equipment was expensive for drillers, however electricity powered a smaller engine that could operate in increasingly remote locations. The rolling cutter rock bit designed by Howard Hughes in 1909 significantly increased the power and speed of the rotary drill. Drilling mud quickly became its own industry, with different formulas developed to interact differently with each rock formation.

Fast and accurate drilling required precision which could only be gained through years of practice. The processes of first learning to drill and then drilling in remote areas for weeks on end reinforced a particularly intimate yet oppositional relationship between oil drillers and nature. George Abell described the subsurface geology known to a driller working east of Abilene:

The noses or wrinkles, with no closure on one end or one side, sometimes it would depend on the direction of the dip, sometimes the oil accumulation there would be in those wrinkles due to the closed end of the wrinkle being on the up-dip side…In other instances of oil accumulation in such wrinkles would be a sand condition where oil would be accumulated in sands found in these little wrinkles. It would be trapped up there and couldn’t get out even though there was not actual closure on one end.

122 Brantley, History of Oil Well Drilling.
123 Promotional Literature, Hughes Tool Co., Trade Literature Collection, Smithsonian Archives Center, Washington, D.C..
124 George T. Abel, Charles Vertrees, Berte Haigh, and S. D. Myres, interview, February 2, 1971, Midland, Texas, Oral History Collection, Permian Basin Petroleum Museum, Midland, Texas.; Similar descriptions of shale color, smell, and shape appear in drilling logs from the 1930s. Drilling Logs, Box 2.207/E220 Exxon Mobil Historical Collection, Briscoe Center for American History, University of Texas, Austin, Texas.
Abell’s references to rock formations as “wrinkles” and “closures” indicated an industry vernacular rooted in sensory knowledge, spatial descriptions, and workplace trial-and-error as the driller mapped the subsurface landscape. Topographic maps were not widely used by drillers until after World War II, indicating that successful drillers mapped the subsurface world and stored such information in their heads.\(^\text{125}\)

In contrast, Texas folklorist Mody Boatwright described mistakes made by the inexperienced driller, “[The driller’s] hole was seldom truly vertical — indeed, instances are on record of bits from rigs hundreds of yards apart meeting hundreds of feet under the ground.”\(^\text{126}\) Simultaneously, oral histories described equipment failure due to unpredicted natural phenomena. Drillers remembered that hitting particularly hard rock would break drill bits off in the hole. Others remembered holes caving in due to unstable ground. Yet others recounted “blowouts” – the sudden release of well gas or pressure that kicked the drill out of the hole and high into the air. One driller’s memorable account described hitting a gas bubble underground which caused a massive explosion, collapsing the rig and killing several workers.\(^\text{127}\)

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\(^{125}\) Looking at archival collections for West Texas drillers and industry geologists that span the twentieth century, substantial subsurface maps did not appear until the late 1940s. Survey Book, Folder ‘Exploration and Producing 1935,’ Box 2.207/E220, Exxon Mobil Historical Collection, Briscoe Center for American History, University of Texas, Austin, Texas.; Exploration Documents, Folder ‘J Edgar Pew Production Subject Files, By County, Texas,’ Box 85, 86, Sun Oil Company Collection, Hagley Museum and Library, Wilmington, Delaware.; Reports, Folder ‘Ruth Bennett # 2, 3, 4, 5, Well Records and Casing Reports, Yoakum County, TX 83-021,’ Box 83-021 3 of 4, C. J. Red Davidson Collection, Permian Basin Petroleum Museum, Midland, Texas.

\(^{126}\) Boatwright, *Tales from the Derrick Floor*, 225.

One of the most significant barriers to expedient oil extraction was lack of water. In the years before extensive West Texas electrification, water was necessary to power the steam engines that powered drills.\textsuperscript{128} Water was needed in case of fire. Workers and pack animals on isolated drilling rigs required water for drinking and, sometimes, bathing. Most importantly, however, the rotary drill required a steady supply of water to create drilling mud. Drilling mud removed debris from the rotary pipe during drilling, in the process coating the sides of the hole to prevent well cave-in. Drilling mud was crucial to maintaining stable well pressure and preventing a blowout which could damage equipment and kill the men working the drill. In the early-twentieth century, drilling mud was made onsite using the head driller’s personal specifications and any readily available supplies. In one instance, former driller Curt G. Hammil remembered using a convenient herd of cattle to churn up enough mud to keep the drill in operation.\textsuperscript{129} A typical drilling mud consisted of a specific mixture of water, local clays, acids, and other chemicals. Drilling mud was stored in a pit next to the drill. After use, drilling mud, sand, and stone particles cut loose by the drill bit and forced to the surface were discarded into a series of “settling pits” where the mud was examined for evidence of oil.\textsuperscript{130}

Water was in exceedingly short supply in the Permian Basin. As with the development of agriculture and ranching, lack of access to a constant supply of water for

\textsuperscript{128} These engines were low-powered and did not allow the drill to move very fast, however they required large amounts of water. By the 1920s, development in internal combustion engine design meant that steam was slowly being replaced with engines powered via fuel oil. Advertisements and “Guide to Standard Oil,” Box 3 and 4, Warshaw Petroleum Collection, Smithsonian Archives Center, Washington, D.C..

\textsuperscript{129} Boatwright, \textit{Tales from the Derrick Floor}, 18.; Soon after the Sharp Machine was developed and patented to mix mud for drilling. Over time, drilling mud became a complex mixture of chemicals.

\textsuperscript{130} Brantley, \textit{History of Oil Well Drilling}, Chapter 5.
drilling operations was a significant hindrance to the industry’s early development. In contrast to East Texas Oklahoma, or Pennsylvania, where drillers simply diverted water from local rivers or streams, drillers in the Permian Basin had to either ship in a large supply of water or drill water wells before a new well was dug. Wells thus often required securing water rights from local landowners and the construction of windmills and water storage tanks. Such construction compounded drilling delays, increased workplace hardship, and amplified costs to drilling companies.

Much like cowboys and ranch hands, in the Permian Basin knowledge of the landscape, weather patterns, and subsurface geology, along with experience using new technologies were the ultimate weapons in an ongoing battle against nature. Such knowledge shortened time away from family and friends, reduced the risk of accidents, and made it more likely that drillers would strike oil – and therefore get paid for a job successfully completed. The success of drilling depended completely upon the driller’s geological knowledge. According to Mody Boatwright, “At the beginning of the century the driller was directly dependent upon his senses. He surmised what was going on under the ground largely by the feel of the cable, or by the sound and speed of the rotary.”


133 Depending upon the drilling crew, workers were paid in a variety of ways. Most were paid upon the completion of a set number of days drilling. Some were paid upon the successful discovery of oil. Others, especially in hard economic times, were paid in room and board or in potential future oil profits. James “Pete” Williams, interview, September 15, 1971, San Angelo, Texas, Oral History Collection, Permian Basin Petroleum Museum, Midland, Texas, 11-12.; Ford Chapman, interview, November 8, 1978, Abell Hanger Collection, Permian Basin Petroleum Museum, Midland, Texas.

134 Boatwright, Tales from the Derrick Floor, 225.
Sensory knowledge of the land and oil technology was gained on the job. Because labor shortage meant that the industry was flush with inexperienced workers, this knowledge was the ultimate badge of prestige for oil drillers. The type of bit, size of pipe, and viscosity of mud all depended upon the type of rock and earth being drilled. Harder rock required less viscous drilling mud – because the hole was less likely to cave in - but also required the more technically challenging fishtail bit to chew through hard surfaces. Holes could become clogged with dirt, mud and debris, so most drillers kept water circulating through the pipe at all times to prevent a clog. If the pipe did become clogged, it was pulled out of the ground and cleaned out, a process that took both time and experience to complete safely.¹³⁵

Drillers gained geological knowledge on the job and used sensory knowledge to predict subsurface phenomena. Little technology existed initially to aid in this process. Before the 1920s, drillers would simply examine buckets of discarded mud from the slush pit. Drillers would “wash” the mud with water and then see if an oily slick emerged, signaling the presence of oil. Plummer M. Barfield explained that:

> There was [sic] quite a few old timers and that came from West Virginia and Pennsylvania that were exceptionally good looking at those cuttings in that mud bucket and telling you what it was and where it was at. There was any number of them that were gifted with the ability to take that mud up there and run that sand through their fingers, and some of them could tell you what it would do and what it wouldn’t. That’s what made a driller, was the ability to read his mud.¹³⁶

For these drillers, knowledge of the earth and its contents came from sensory analysis and

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¹³⁶ Boatwright, *Tales from the Derrick Floor*, 200.
workplace experience.

During the 1920s, as technologies improved, there was a wave of experimentation in “core-sampling” technologies. It became popular to take rock or mud samples as the drill was running to ascertain what was happening at the bottom of the oil well. According to one oral history, a Mr. Robicheaux designed one of the first down-hole testing technologies, called a “core barrel.” The core barrel was attached to a chain and then dropped down the drill pipe. The core barrel landed in a hole in the middle of the drill bit and collected down-hole mud as the drill was used. The core barrel could be drawn up without requiring the removal of the entire drill from the hole.

Core samples were particularly good for identifying salt domes, or, pockets of salt deep underground. As early as the 1860s drillers knew that salt domes were often located near oil deposits. Permian Basin drillers were particularly quick to adopt this new technology. Salt deposits were common in the region, the result of the Delaware Sea drying out and then refilling over several millions of years. To search specifically for subsurface salt, drillers would send down a core barrel filled with water saturated with salt. Once salt was identified, drillers would work to estimate the edges of the salt dome, and attempt to drill as close to the middle of the formation as possible.

A growing sense of control over the land and its contents was expressed through drilling logs over the course of the 1920s and 1930s. As drilling technology and oil detection science improved, the element of dumb luck was redefined as scientific

139 Boatwright, Tales from the Derrick Floor, 216.
guesswork. Head drillers kept log books detailing everything from the daily distance drilled, the presence of salt water, any core samples taken from the well, the schedule used to shoot nitroglycerine into the well, and a discussion of the estimated well pressure. In the case of the Sun Oil Company, reports generated from these log books were sent regularly to the company president. Analysis of Sun Oil’s drilling reports along with log books from the Texas-based Magnolia Oil Company reveals the slow increase in well depth over time as well as drillers’ and rig workers’ increasing knowledge about the natural environment they inhabited.¹⁴⁰ Using only factors such as drilling speed, wear on the drill bit, and analysis of drilling mud forced up from the hole, a skilled driller could piece together a fairly accurate picture of the subsurface rock strata. Many of these reports were combined and carefully transposed onto maps documenting in exhaustive detail the subsurface rock formations of the Permian Basin.¹⁴¹ In this way, costs could be better estimated and risks thwarted. These reports were also relayed to the oil company board and primary investors as reassurance that the driller knew what he was doing.¹⁴²

Such efforts placed individual Permian Basin drillers as part of a national effort to catalogue, quantify, and publish knowledge about the subsurface world. Organizations

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¹⁴⁰ Drilling Reports, Folder ‘J. Edgar Production Subject Files by County, Texas C-J,’ Box 85, Series 3, Sun Oil Company Collection, Hagley Museum and Library, Wilmington, Delaware.; Drilling Logs, Box 2.207/E220, Exxon Mobil Historical Collection, Briscoe Center for American History, University of Texas, Austin, Texas. See also, “Well Completion Records,” Box 83-021, C. J. Red Davidson Collection, Permian Basin Petroleum Museum, Midland, Texas.

¹⁴¹ Maps, Folder ‘Ruth Bennet #1 Correspondence Yoakum County TX 83-021 C J Red Davidson,’ Box 3, C. J. Red Davidson Collection, Permian Basin Petroleum Museum, Midland, Texas.

¹⁴² Production Records, J. Edgar Pew Production Subject Files, by County Texas, Box 85, 86, Series 3, Sun Oil Company Collection, Hagley Museum and Library, Wilmington, Delaware.
such as the American Petroleum Institute (API), the Mid Continent Oil and Gas Association (MCOGA), and the US Bureau of Mines were working on large-scale industry documentation and quantification projects. These efforts divided the nation into geological zones and production districts for ease of statistical quantification. The various engineering scientific societies were some of the first to map out industry territories. The American Institute of Mining, Metallurgical, and Petroleum Engineers, founded in Wilkes Barre, Pennsylvania in 1871, spent a great deal of the early-twentieth century publishing exhaustive reports about new discoveries in subsurface strata as well as mapping out industrial territories based upon production amounts. The API also used their data to publish annual compendiums of oil drilling statistics. In these documents, the two largest oil producing states, Texas and Pennsylvania, were divided into several smaller districts. While this was in some ways an academic exercise, such efforts contributed to larger processes of quantifying space and nature. This statistical database would become the basis for World War II oil production quotas and the postwar oil industry regulatory system.

As Permian Basin geology became better understood during 1920s, both speculative drilling and oil discoveries sped up. Several rotary drilling depth records were

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143 The Permian Basin Division was not officially founded until 1945. Thomas A. Frick, *Centennial History of the American Institute of Mining, Metallurgical, and Petroleum Engineers*, 1971, Dallas, Texas, Special Collections, Hagley Museum and Library, Wilmington, Delaware.


set in the Permian Basin in the 1920s and 1930s.\textsuperscript{146} In 1923 the Texon Oil and Land Company drilled to a depth of 6,350 feet at Big Lake. Several records were set in 1928. The V. T. Bolin Company discovered oil near the town of Kermit; the Texon Oil and Land Co. once again set a producing well-depth record near Big Lake, drilling to 8,523 feet; and oil was discovered on the Cowden ranch near Odessa at over 4,000 feet underground.\textsuperscript{147} By the end of the decade, the largest Texas oil companies, including the Texas Oil Company, the Gulf Oil Company, Humble Oil, and Magnolia Petroleum, were heavily involved in the region. In 1930 the Yates field alone produced 50,725,000 barrels of oil. By comparison, the better-established Gulf Coast fields did not produce much more, reaching a total of only 69,676,000 barrels.\textsuperscript{148}

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Ultimately, the monumental discoveries at Santa Rita, Yates, and others would bring significant changes to the Texas Permian Basin. However, when oil arrived in the early 1920s, it initially offered few challenges to the status quo, easily meshing with established hierarchies and social relationships. The arrival of oil easily fit with elite understandings of land as a tool for economic success and self-sufficiency. For these elites, early searches for oil in the 1920s provided expedient relief from debt and

\textsuperscript{146} Brantley, History of Oil Well Drilling, 1474.

\textsuperscript{147} Myres, The Permian Basin, Chapter 5.

\textsuperscript{148} API Facts and Figures, American Petroleum Institute, 1932, Trade Literature Collection, Hagley Museum and Library, Wilmington, Delaware. This trend would continue for the next several decades. In 1935, the Gulf Production Company set a new drilling record in Upton County, Texas at 12,786 feet. In 1944 Phillips Petroleum set a record in Pecos County at 15,279 feet, and again in 1945 in Brazos County at 16,655 feet. The height of this drilling arms-race was reached in 1958 as Phillips Petroleum spent ten years drilling to an astonishing depth of 25,340 in Pecos County. Daniel Peacock, “Phillips Sets New Texas Depth Record at Pecos County Well,” Odessa American, April 29, 1958, Odessa, Texas, 4.
foreclosure brought on by regional drought. These elites had a vested economic interest in the expansion of the oil industry in the Permian Basin and so did little to hinder its expansion. For the region’s itinerate ranching labor force, the arrival of oil solidified a cultural understanding that nature was both easily conquered by humans and a mysterious, anthropomorphized force working to thwart such control. This labor force easily moved into oil work as the industry expanded. Similar workplace hierarchies, dangers, and social relationships made this transition relatively smooth.

New oil technologies taught people to look for wealth below the ground, rather than on top of it. Increasingly, land value, and the potential for economic self-sufficiency was no longer based simply on having enough land and water to feed cattle, but rather on the ability of increasingly complex technology to detect the presence of oil, delve deep enough to strike oil deposits, and then transport that oil to market. Despite a relatively easy transition, oil industry development and expansion sped up the rationalization and quantification of land, space, and natural resources in terms of personal profit. Efforts to clearly define the borders of oil leases and mineral rights further implicated both local ecology and subsurface geology in an increasingly abstract system of ownership. This system would come under intense scrutiny in the 1930s as overproduction threatened to derail the industry.
Chapter 2
A Tough, Greedy, Brawling Time and Place

In 1919, University of Texas law professor and Chief Supervisor of the Texas Railroad Commission George Butte commented on a natural gas dispute in the Texas Panhandle:

True conservation is not hoarding, but it is the wise use of natural resources …The heart [of the conservation problem] is the conflict between the present and the future. The individual producer is interested primarily only in immediate present personal return. The great consuming public is interested in conserving the supply and bringing about a slow, wise and economical exhaustion so as to insure continuity in service for the future…Conservation demands intensive rather than exhaustive use.¹

While Butte did not support centralized, bureaucratic management of the oil industry, he did express a widely-held belief that oil industry waste was the result of greed and a lack of foresight. His words would prove prophetic in 1930 and 1931 as massive overproduction and waste in the newly-discovered East Texas field caused global oil prices to plummet and exacerbated the Great Depression.²

In 1935, API president Axtel Byles presented a petition before the US Congress. Byles vehemently opposed new regulations placed on the industry designed to enforce, “slow, wise, and economical exhaustion.” Instead, Byles likened regulation to the

² Olien and Hinton, Wildcatters, Chapter 3.
government confiscation of private property, “There is nothing in the inherent nature of petroleum, or in the conduct of the business, which requires or justifies the oil industry being declared a public utility any more than in the case of any other producer or manufacturer of a commodity of general use.” Byles was responding to a wave of public officials, industry leaders, environmental conservationists and antimonopoly activists who believed that the US oil industry was fundamentally corrupt. In the early 1930s, overproduction drove down the price of a barrel of oil by approximately ninety eight percent. Many people both within and outside the industry, among them George Butte and Axtel Byles, were greatly concerned about industry waste. Most agreed that irresponsible oil extraction depleted a precious natural resource. The question was, what was to be done?

In this chapter, I focus on the 1930s to contrast differing understandings of unacceptable oil industry waste, differentiating between the perspective of workers, industry management, conservationists, and federal regulators. From the earliest days of the oil industry, national politicians, oil industry leaders, and independent producers saw waste of an important and lucrative source of fuel as intolerable. An ongoing national debate about resource ownership and public good began in the 1840s and continued into the twentieth century. In contrast, human bodies wasted by dangerous workplace conditions or the wasted oilfield environment, contaminated by unregulated and out-of-control oil wells, was not a part of this conversation.

In the Permian Basin, desert climate and insufficient equipment made drilling for

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oil dirty, dangerous, and at times deadly. Oil soaked into skin; sulfur and other gasses released during drilling poisoned lungs; gushers and well fires blew off body parts and flattened men under collapsed rigs. Even as it hurt the men doing the work, overproduction did permanent damage to the land. To pull oil from rock and sand thousands of feet below ground, drillers blew air and gas deep into the earth, exploding subsurface rock, and contaminating the surrounding land and groundwater with life-killing salt and crude oil. In interviews, workers lamented the high price they paid for their jobs, but did little about it, except switch from workplace to workplace, and try to climb the ranks to escape the most dangerous work. Unlike in other Depression Era industries in which workers organized, struck, and demanded limited hours and safer workplaces, in the Permian Basin even the lowliest roughnecks accepted, and even embraced, a catastrophically high level of risk.\(^4\)

By the beginning of World War II, industry leaders congratulated themselves for largely solving the overproduction problem. Large producers partnered with federal and state regulators to limit oil extraction rates and stabilize oil prices. In the process, large producers conveniently doomed their smaller, weaker competitors who couldn't afford to

abide by the regulations. While Permian Basin locals engaged in a fierce debate about the meaning of outsider regulation to stabilizing oil prices and the consequences of large company control, community leaders did not even consider regulations to protect either oil workers or the land. Even ranchers, whose land was left barren and unable to support cattle by drilling, accepted the loss as the price of wealth from oil leases.

Deep belief in individual autonomy helped to make Permian Basin residents ambivalent about federal intervention to decrease overproduction and largely indifferent to workplace hazards. It was not that workers in the Permian Basin did not see pollution caused by extractive expansion. Rather, the processes of extraction became the basis of community identity. Demonstrating the legacy of the region’s rough-and-tumble cowboy folklore, oil workers understood personal physical risk as a part of a self-conscious battle against nature. Personal health was a matter of individual fortitude and success was a point of masculine pride. Labor historians have documented the importance of physical competence to industrial workers, with knowledge of the workspace and its demands the basis of workplace hierarchy. In the Permian Basin oil fields, the daily manipulation of nature using large, loud, and dangerous oil technologies gave workers a sense of power that helped mediate the unpredictability of physical risk. Successful survival in the face of numerous hazards created community cohesion among a uniformly male, largely temporary workforce. Viewing oil discovery as the result of savvy risk assessment and personal daring, workers looked askance at state or federal

attempts to limit oil extraction. The idea that the state should regulate personal workplace risk was not on the radar.

This narrative is unique to neither to oil nor to West Texas. As Matt Huber argues, for many men in the twentieth-century United States to get rich was a spiritual calling and to acquire land was to fulfill a masculine duty. In the early-twentieth century, the acquisition of profit, wealth, and land was often equated with moral and ethical fortitude. However, such a pragmatic focus had consequences. Eighty years of scholarship has revised the famous Turner Thesis to conceptualize the American West as a plundered, colonized space, used by absentee investors for extractive gain who left ecological destruction and human suffering in their wake. Analysis of mining operations in the Rocky Mountains and California has been particularly fruitful for understanding the ways in which extractive systems made places and people expendable. Other scholars have noted that in the early environmental movement aesthetic beauty determined which ecologies were considered worthy of protection from human destruction. Throughout Texas, a combination of new transportation technologies and geographic isolation allowed investors to extract oil wealth with little-to-no regard for the local environment or economy. In the flat, monotonous Permian Basin, inhabited almost completely by oil workers looking to make a quick profit from extraction, there was little

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A series of small discoveries preceded the run on the massive East Texas Field and global oil market collapse. In 1927, oil prospector and notorious business charlatan Columbus Marion “Dad” Joiner made his first small oil discovery in Rusk County near the Texas-Louisiana border. Over the preceding decade, Joiner had made most of his money selling stock in fraudulent oil leases to an East Texas network of sharecroppers and small farmers.\(^\text{10}\) As a result, no one was more shocked than Joiner when his Daisy Bradford No. 3 well actually struck oil in October 1930 and again in January 1931. By the summer of 1931, the East Texas Field was producing approximately 900,000 barrels per day.\(^\text{11}\) Initially, geologists assumed Joiner had made two separate discoveries due to the wells’ distance apart.\(^\text{12}\) The realization that this was actually one giant oil field caused a rush on the region and drew a sudden influx of smalltime speculators and large oil companies to East Texas. Reflecting the region’s patchwork geography of small, subsistence farms, individual drilling leases were tiny. Derricks sprung up only a few feet apart, disrupting farms and displacing entire towns, and Joiner’s network of small landholders became unimaginably wealthy.

The East Texas discovery had abrupt, nation-wide consequences. An oil market


already glutted by recent discoveries in the Permian Basin was put into an immediate tailspin. The East Texas field caused market oversaturation and a sudden and precipitous drop in global oil prices.\textsuperscript{13} Crude prices dropped from a little over one dollar per barrel in 1930 to two cents per barrel in 1931. While prices rose briefly to sixty cents per barrel in 1932, they dropped to forty cents the next year and steadily declined until the US entered World War II.\textsuperscript{14} Rampant speculation and lack of regulation in both the number of wells dug and the amount of oil extracted was paired in East Texas with easy access to transport networks and communication lines, causing widespread social chaos. Reports of crime, disease, overcrowding, and gratuitous oil waste appeared in newspapers across Texas, exacerbating statewide frustration at the economic downturn.\textsuperscript{15}

Fears about falling oil prices and calls to regulate unruly and greedy prospectors quickly became common in popular publications nation-wide. Such diverse periodicals as the\textit{New York Times} and the\textit{Austin Statesman} blamed the industry for its greed. In 1933, an article in the\textit{Marshall Messenger} explained, “It’s like several small boys with straws going after one ice cream soda. The first man to get his well down sucks oil from beneath all the surrounding country.”\textsuperscript{16} As early as July 28, 1929, the\textit{Abilene Reporter News Sun} prophesied that drastic reduction in production was necessary to stave off falling prices.


\textsuperscript{14} Ibid.

\textsuperscript{15} Suggesting the level of paranoia this produced, a 1929 article in the\textit{Austin Statesman} revealed that Texas Land Commissioner J. T. Robison kept a shotgun in his desk “as only a precaution.”\textit{Austin Statesman}, 1929, Box 3L425, Oil Scrapbooks, Briscoe Center for American History, Austin, Texas.

However, the paper offered no practical suggestions as to how this should be done. As the problem got worse in 1930 and 1931, other newspapers blamed the East Texas field for a precipitous drop in oil prices but offered few solutions.

Although the East Texas field initially overshadowed the Permian Basin in total number of barrels produced, many early newspaper reports compared the discovery to the Santa Rita strike seven years earlier. Papers used similar cowboy imagery and discussion of gambling, gunfights, and gratuitous risk-taking. However, despite cultural similarities, the geography of the East Texas field was very different from West Texas, making it much harder to regulate production. A tendency toward rampant speculation and overproduction in West Texas had been kept relatively in check by the unreliability of oil transport networks and the inability to get large quantities of West Texas crude to buyers. Lack of infrastructure meant that if oil could not be sold immediately, it was very difficult to store above ground. Further, because oil leases in West Texas were controlled by a relatively small number of landholders and administered by a select group of large oil companies, it was possible to negotiate between companies, keeping oil production predictable and relatively organized within a single field.

In contrast to West Texas, the East Texas field was located near the rising urban centers of Dallas and Fort Worth and a robust railroad network was already in place to service the region’s oil producers. Compounding the problem, labor was in easy supply.


After the crash of 1929 out-of-work drillers, roustabouts, pipe layers, and tank men flocked to the region, competing with ousted sharecroppers and itinerate farmhands for industry jobs.\textsuperscript{20}

When the Permian basin had experienced its first boom back in 1923, regional producers had negotiated among themselves to avoid market saturation, experimenting with a variety of methods that would become common in later decades. Soon after the initial Permian Basin discoveries in 1923, some local producers who remembered the unstable decades of the 1890s and 1910s became worried that the sudden production increases would make oil prices unstable. Hoping to avoid government intervention, oil companies in the Permian Basin worked together to regulate allowable oil extraction amounts. The large Yates field was the site of much experimentation. The field was easier to organize than most because Ira Yates preferred to only sell leases on large tracts of land, meaning fewer producers and easier negotiations. Yates initially only sold sixteen oil leases on 8,000-acres of his property.\textsuperscript{21} Due to their size, these leases were more expensive and mostly bought by large companies including Humble, Gulf, and Pure Oil, as well as Benedums, Transcontinental Oil, and the Mid Kansas Oil and Gas

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Company. In 1927, W. S. Farish and the Humble Oil Company called a meeting in Fort Worth of all major leaseholders in the field to discuss overproduction. While these initial talks failed, a second attempt at voluntary regulation was more successful. Humble convinced everyone who used its pipelines to agree to a proration system in which each company agreed to extract a set amount per day based upon proven oil reserves. However, some argued that this arrangement unfairly favored the largest producers who had access to more land and therefore more oil. Simms Oil Company proposed another idea in which all proven fields were divided up into 100-acre “production units” with each unit given a production limit. Yates leaseholders agreed with this plan and a state commission was established to monitor production and ensure fairness.


Olien and Hinton, *Wildcatters*, 47.
This experimental system was very similar to contemporary state regulatory arrangements and Simms’s plan did decrease Yates production to one-fifth of its previous rate.²⁵ Although it was loudly praised within the industry as a success, Yates represented only one field among many in the region.²⁶ Other fields, in particular the Hendricks field which was divided into over five hundred very small independent leases, only increased

²⁵ Before the 1930s, attempts at oil regulation were typically implemented on a field-by-field basis. Depending on the state, industry or state officials would attempt to enforce rules that limited the number of wells allowed in a single field. Most efforts were unsuccessful. Sharon O. Flanery and Ryan J. Morgan, “Overview of Pooling and Unitization Affecting Appalachian Shale Development,” Steptoe & Johnson PLLC, Charleston, West Virginia.; Gorman, Redefining Efficiency, Chapter 3, 4.

²⁶ Cooperation in the Yates field was held up nationally as an example of rational, free-market risk management that could be used nationally to solve the looming problem. Sam Ashburn, “Yates Pool-Wightiest [sic] of Producing Areas,” Lubbock Avalanche-Journal, September 23, 1928, Lubbock, Texas, 5.; “Increase for Oil is Asked,” Lubbock Morning Avalanche, August 31, 1932, Lubbock Texas, 4.
production during the late 1920s. The Yates field efforts at controlled extraction were ultimately rendered moot as fears that small, uncontrollable drillers in the Hendricks field would extract all the region’s oil before others could get to it. Production increased once again throughout the region, dropping both oil prices and well pressure. This renewed spike in production led to another wave of calls for regulation and intervention by state officials.\textsuperscript{27} Industry leaders such as W. B. Hamilton of the Oil and Gas Bureau of the West Texas Chamber of Commerce and state bureaucrats such as R. D. Ponter of the Texas Railroad Commission came together to push for regulation. In April 1928, the Railroad Commission set allowable extraction in the Hendricks field at 150,000 barrels per day, one fifth of its production capacity. As in 1927, these efforts would yet again fall short of stabilizing oil prices as California and Oklahoma production continued to increase during this period.\textsuperscript{28}

The East Texas catastrophe further illustrated the problems with industry self-regulation and generated widespread industry ridicule. Such opposition was fed by 70 years of American fear about oil depletion, overproduction, and industry wastefulness.\textsuperscript{29} Even before the 1930 crisis, it was clear to many in the industry that the only way to

\textsuperscript{27} This debate in 1927 was identical to the debate four years later over the East Texas Field with a mix of large oil companies and state officials called upon to regulate unruly small producers. AP, “Oil Operators Invited to Big Dallas Meet,” \textit{Longview News-Journal}, June 6, 1931, Longview, Texas, 1.
stabilize oil prices was to enforce coordinated oil conservation nation-wide. Although the catastrophe was largely precipitated by small oil companies who needed constant revenue to avoid bankruptcy, pundits argued that large oil companies were keeping prices artificially low to bankrupt their smaller competitors. Some began calling for federal intervention, relying upon a nineteenth and early-twentieth century antimonopoly muckraking tradition that, twenty years earlier, had helped to break up the Standard Oil Trust.

Beginning in the 1880s, the initial charge against big oil had been led by group of lawyers and journalist including economist Simon Sterne, Ohio oil-producer-turned-author George Rice, author-cum-activist Henry Demarest Lloyd, and journalist Ida Tarbell. Their calls for increased government regulation of the industry and the breakup of the Standard Oil trust spurred widespread antimonopoly agitation and an onslaught of federal regulatory litigation and legislation in the closing decades of the nineteenth century. Magazines intended for the middle class loved the topic. Muckrakers sounded the alarm in Atlantic Monthly and Collier’s. Others began writing books. George Rice

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30 In 1926, similar proration attempts in Oklahoma met with lack of cooperation and ultimate failure. Summing up the opinion of the opposition, local oilman Tom Slick was quoted as saying, “No state cooperative commission will tell me how to run my business.” The API attempted to form a national coordination committee in 1929 but was stymied by lack of regulatory bodies in California and Louisiana. Olien and Hinton, Wildcatters, 52.


32 In 1888, the U.S. House Committee on Manufacturers opened a federal investigation into Standard Oil. In 1889 Senator Sherman of Ohio introduced a bill to bar all vertical and horizontal integration. In the 1890s, Texas and Ohio each filed individual suites against Standard Oil. Hugh S. Gorman, Redefining Efficiency: Pollution Concerns, Regulatory Mechanisms, and Technological Change in the U.S. Petroleum Industry (Akron: University of Akron Press, 2001), Chapter 1.

These efforts were popularized in newspapers such as the New York World, which created the famous images of John Rockefeller as an anthropomorphized octopus perched on top of a map, with tentacles reaching across countries and continents.34 Ida Tarbell’s series of articles, titled “The History of the Standard Oil Company” was published in McClure’s Magazine between 1902 and 1904 and captured the sentiment among big business opponents:

One of the most depressing features of the ethical side of the matter is that instead of such methods arousing contempt they are more or less openly admired. And this is logical. Canonize "business success," and men who made a success like that of the Standard Oil Trust become national heroes! The history of its organization is studied as a practical lesson in moneymaking. It is the most startling feature of the case to one who would like to feel that it is possible to be a commercial people and yet a race of gentlemen….35

Her series took on a life of its own. Tarbell’s McClure’s articles were published in book form, and then adapted into a play called “The Lion and the Mouse,” which was then

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34 The image of Rockefeller as a vicious anaconda is the result of a quote attributed to him. Speaking about the fate of independent producers who stood against his vertical integration plans, Rockefeller is said to have responded, “we will squeeze you out and you will die.” “Next!” Udo Keppler, Puck Magazine, 1904.

35 Tarbell’s work became wildly popular. Her exhaustive use of documents and financial records coupled with a tone of complete moral outrage served as the final death knell for Standard Oil in the court of public opinion.
later published as a novel.\textsuperscript{36} Public outcry fermented into political action. In 1901, newly elected Progressive president Teddy Roosevelt formed the Bureau of Corporations, within what would become the Labor Department, in order to investigate Standard Oil. The Standard Oil Trust was formally dissolved in 1911 by enforcement of the Sherman Antitrust Act.\textsuperscript{37}

By the time the East Texas field stirred up controversy in the 1930s, the oil industry had been engaged in a fifty-year battle for public opinion in which reformers paired fear of economic unpredictability with concern about business greed. Rockefeller’s Standard Oil seemed to symbolize a fundamental sickness in US business culture. Some understood big oil companies as pushing out smaller ones and ending individual autonomy.\textsuperscript{38} Others were concerned about depleting the limited natural resources in the continental US. The public outcry against oil monopoly at the turn-of-the-century coincided with the first sustained conversations about natural resource depletion and the need to establish national oil reserves. While some oil conservationists shared the Progressives anti-greed mentality, it was clear to others that removing the predictability of monopoly would only help to further deplete domestic oil supplies.\textsuperscript{39}

On the eve of World War I, the oil depletion question was of paramount concern to

\textsuperscript{36} “Miss Tarbell is Not to Go On Stage,” \textit{San Francisco Call}, March 17, 1907, San Francisco, California, 51.
\textsuperscript{39} Gorman, \textit{Redefining Efficiency}, Chapter 6.
US military leaders.\textsuperscript{40} However, opinion was divided between those who supported federal intervention into oil extraction and those who believed industry cooperation was possible. The push for government intervention was led initially by the first generation of professional petroleum geologists. As early as the 1880s, University of Pennsylvania professor Peter Lesley and his assistant John F. Caril prophesied that the US would run out of oil by 1935.\textsuperscript{41}

Spurred on by such sensational reports, in 1914 George Otis Smith, the head of the United States Geological Survey (first founded in 1879) called for a massive, scientific survey of potential oil reserves.\textsuperscript{42} Several inconclusive studies, conferences, and pamphlets later, a new tactic was chosen. The newly formed US Bureau of Mines within the Department of the Interior tasked Joseph Austin Holmes with estimating the total amount of oil wasted over the past sixty years due to bad storage and transport methods. While his numbers were guestimates at best, he estimated that a startling 425 trillion cubic feet of oil had been wasted between the 1840s and 1914. Holmes’s numbers reached both the popular press and the US Senate. These findings were paired with fiery rhetoric from Mark L Requa, then President of the Independent Oil Producers Agency and who would go on to become head of the Oil Division of the US Fuel Administration during WWI:

Our way of prosperity makes us careless of the future; we feast and revel while the handwriting blazes on the wall in letters of fire…as a nation we are wasteful, apathetic, and forgetful. We waste our natural resources with shameful prodigality; we are apathetic of the future, and we forget that our reserves of natural wealth are

\textsuperscript{40} Daniel Yergen, \textit{The Prize: The Epic Quest for Oil, Money, and Power}, (New York: Simon and Schuster, 1991), 196-197.
\textsuperscript{41} Olien and Hinton, \textit{Oil and Ideology}, 121.
\textsuperscript{42} George Otis Smith, “Where the World Gets Oil and Where Will Our Children Get it When American Wells Cease to Flow?” \textit{National Geographic} 37 (February 1920).
by no means inexhaustible.

In this speech, Requa went on to predict that when oil was used up there would be, “commercial chaos or commercial subjugation by the nation or nations that control the future source of supply form which petroleum is derived.” Like the anti-monopoly muckrakers, Lesley and Requia deplored what they considered to be the greedy culture of oil – singling out the right of capture system as a problem that promoted greed and excessive production. In the short term, this combination convinced the President to establish the first federal oil reserves in California at Elk Hills and Buena Vista Hills.

The national oil conservation debate continued into the 1920s as photos and sensational reports of massive gushers, lakes of oil, and blighted landscapes in the Permian Basin reached east-coast urban centers. This sparked the revival of rhetoric that drew from the decades-old anti-capitalist rhetoric of Progressives like Ida Tarbell as well as Teddy Roosevelt’s conservation efforts. Legislators, along with a mixture of independent producers, representatives from major oil companies, and some oil leaseholders argued that oil reserves needed to be protected from an industry predisposed to either monopoly or self-destructive, wasteful greed. Many proposed increased government regulation as a solution.


In Texas’ seemingly inexhaustible oil fields, the main concern was industry monopoly, not oil depletion. In 1917 the Texas Legislature amended the state constitution to officially declare that the state’s natural resources should be conserved and that Texas should enact laws to ensure conservation. Despite this effort, a series of laws in 1917 and 1919 designed to further curtail overproduction and prevent monopoly were largely ineffectual. In 1917 the Texas Railroad Commission (RRC), then a governing body designed to oversee railroad shipping freight rates, was given the power to enforce common carrier laws for oil pipelines. This meant that oil pipelines owned by any single company were not allowed to refuse to carry another company's crude oil or refined products. That same year, the Railroad Commission was also given the power to enforce well spacing laws, usually by paying the Texas Rangers to enforce marshal law.

These Texas efforts represent a broader alliance between early conservationists such as Gifford Pinchot during the early decades of the twentieth century who saw the “closing of the frontier” as a national tragedy and industry professionals such as Peter Lesley who supported government intervention into what they perceived to be a fundamentally destructive industry. Such fears escalated in the 1920s, fermenting into a

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47 The Texas legislature passed two laws in 1917, one ordering the separation of pipeline companies from producing companies and another that designated all pipeline companies who carried oil for others to be designated common carriers. This meant that in fields with a limited number of pipelines, pipeline companies could not discriminate between which company’s oil was transported. The legislature placed the Texas Railroad Commission in charge of administering these regulations. The 1919 Oil and Gas Conservation Act required better oil field record keeping and reports sent to regulators about amounts drilled and transported. Childs, *The Texas Railroad Commission*, 154.
48 Childs, *The Texas Railroad Commission*. 
general fear of resource depletion across the nation. Along with anxiety about oil depletion, reports of a “timber famine” raised concerns about proper stewardship over US forests. Fear that industrialization would lead to catastrophe led many to push for government control over resources and spurred calls for scientific management of the natural world. This conversation became the basis for the strong legislative reaction to the crisis of 1930 and shaped subsequent wave of oil legislation that significantly changed the industry by the end of World War II.

Such widespread anxiety worsened the always antagonistic, relationship between regulatory agencies and Texas oil producers during the East Texas crisis. On August 17, 1931 Texas governor Ross Sterling briefly called in both the National Guard and the Texas Rangers to enforce oil extraction quotas at gunpoint. Ross established a coalition led by Railroad Commissioner Earnest O. Thompson to find solutions to the problem. This task force ultimately placed the RRC in charge of setting quotas for all oil extraction operations in Texas. This meant that the RRC prorated the amount that each Texas oil well was allowed to produce each month based on perceived market demand. Hoping to limit oil stockpiling, the RRC’s legal authority also included the regulation of any oil that was stored above ground. Ultimately, this move gave the RRC control over the supply and transport of the great majority of American crude oil. In the postwar era, the RRC became the organization that set global oil prices.

The Permian Basin’s population of working-class oil industry employees

watched this 1930s debate closely and many were against industry regulation. It was not simply greed driving their opposition. In oral histories, industry publications, and public hearings, oil workers throughout the industry, and especially in the Permian Basin, professed a deep cultural affinity for individualistic, unregulated human action.\textsuperscript{52} Further, the East Texas oil discoveries had a populist appeal that made many sympathetic to oil companies opposition to government regulation. Dad Joyner, the charlatan who made the East Texas discovery, was a small-time, independent oil prospector with old and badly maintained equipment. He used syndicate shares – very small shares sold door-to-door – to finance his early discoveries in East Texas. Because the local population had a deep stake in Joiner’s efforts, an army of East Texas farmers signed on as volunteers to help drill. As Julia Cable Smith of the Texas State Historical Association described it, “Joiner's unstable rig and his oil-rich promises appealed to the generosity and dreams of the hard-scrabble farmers and townspeople who donated their labor and traded supplies for syndicate certificates.”\textsuperscript{53} For many in Texas, accepting government regulation would not only decrease the amount of oil produced and reduce royalties, it would also deprive these loyal, hardworking people of their deserved profit. Newspapers picked up this narrative across the state and oil companies bandwagoned on this message in an effort to stave off popular support for regulation.\textsuperscript{54} In West Texas, they were largely successful.

Popular support for Dad Joiner and opposition to industry regulation represents broader trends in US culture during this period. In the emerging middle class culture of

\textsuperscript{52} Myres, \textit{The Permian Basin: Era of Discovery}, 580.
the early-twentieth century, the acquisition of profit, wealth, and land was lauded as a reward for moral and ethical fortitude.\(^55\) This rose from an older set of beliefs that mixed Christianity with capitalism and faith in an American Manifest Destiny to expand and conquer in the first half of the nineteenth century.\(^56\) Such popular narratives helped fuel the fire of resource extraction. According to industrialists, land speculators, politicians, ministers, and, popular writers the natural world existed to be controlled and improved by humans and undeveloped land was simply wasted land.\(^57\) With such cultural consensus fueling one side of the debate, despite the consequences of overproduction, many continued to see federal intervention as an attack on the sanctity of the free market, private property rights, and the United States’ God-given duty to expand industry. Most people did not understand oil’s environmental impact to be a problem.

A 1957 article in the Standard Oil magazine *The Lamp* captured both support for unregulated free enterprise and concern for early industry wastefulness. “[the nineteenth century] was a tough, greedy, brawling time and place – but from it came the intricate and ordered oil industry of today.”\(^58\) The same critique could be used to describe 1930s West Texas oil communities. Although less pressing to oil prospectors’ bottom line, Permian Basin overproduction had an array of environmental consequences that were immediately visible to workers. As was the case in oil fields across the country before the


Depression, the combination of rule of capture laws and non-existent regulation made speed of extraction, rather than sustained extraction, the focus for oil drillers. Because workers did not expect to stay in the region once a well struck oil, most of these problems were the result of poorly built, or simply absent, infrastructure.

As early as the 1920s, drilling and engineering manuals argued that too many wells in a single field had a negative impact on well pressure, making oil slow to rise to the surface and reducing profits for all. Industry engineers argued that as oil was depleted, drill pipes became flooded with salt brine water, leached into oil deposits from nearby salt domes.\(^5^9\) For most of the twentieth century, the solution to this problem was to pump the salt water out of the ground and let it run unobstructed through the surrounding desert.\(^6^0\) Miles of desert vegetation would become covered in a thick, frost-like crust. As plant life died and was blown away, the lack of ground cover left an eerie, bleached moonscape.\(^6^1\) This was a particular problem in the Permian Basin’s Hendricks Field. In 1929 only six of the 565 wells in the field were producing without gushing salt water.\(^6^2\) The rest flushed salt brine water across the desert, killing the land surrounding oil rigs and making it unsuitable for either commercial ranching or human habitation.

Oral histories and industry publications revealed overproduction’s environmental

\(^5^9\) *Petroleum Development and Technology in 1926*, Petroleum Division AIME, American Institute of Mining and Metallurgical Engineers, Inc., 1927, Hagley Museum and Library, Wilmington, Delaware.

\(^6^0\) Ogden S. Jones, *Fresh Water Protection from Pollution Arising in the Oil Fields* (Lawrence: University of Kansas Publications, 1950).


consequences. While few bemoaned damage to the land, many contributed to a narrative of gratuitous industry waste throughout the 1920s and 1930s. In 1893, the RRC made it illegal to leave unfilled dry holes - thin, cylindrical pits dug by wildcatters in the search for oil that stretched hundreds of feet into the earth – because they negatively affected well pressure in operating wells. Some wildcatters tried to fill in these dry holes before they moved on. Most didn’t. Cattle fell into the holes, breaking legs or simply becoming trapped until they died of starvation or dehydration. Even after the increased regulation by the Texas Railroad Commission in the 1910s, many producers continued extremely wasteful practices such as the close spacing of wells and the venting of natural gas – sometimes called casing head gas – into the atmosphere to relieve well pressure.

Venting gas was particularly dangerous, especially in places such as Crane County where crude oil was particularly high in sulfur. E. N. Beane of Crane County declared, “May I say that in the beginning of this a lot of people were injured, some were killed and a lot of livestock was killed during the time when they had torches and flares. If one of those went out in a low spot that gas would set in there and if there happened to be cattle or horses it would kill them.” Unless immediately burned off with a “torch,” vented sulfur dioxide from oil wells collected unseen in valleys and hollows, proving immediately

63 Childs, Texas Railroad Commission.
64 Much as gasoline was considered a waste product until engineers found a use for it in the twentieth century, natural gas was considered a waste product with only limited uses until after the Second World War. Late-nineteenth century geologists knew that oil was a finite commodity and efforts to reduce waste led to a period of conservation and regulation beginning in 1893 in which the federal government forbid wasteful actions such as venting natural gas directly in the air. Gorman, Redefining Efficiency, 112.
deadly to any human, livestock, or wild animal who breathed it in.\textsuperscript{66}

Each wildcat well contributed to a cumulative impact on local ecology. George Bentley, a contractor who prepared prospective well sites for drilling described his daily activities, giving some sense of the impact:

In this country…we have the mountain country, we have the sub-irrigated country, we have the deep sand country so it is necessary for us to go in and cut a sendero the width of the road specific to be built and then it is necessary that we haul an aggregate called caliche and cover this road to where you can carry the heavy weights over it by trucks and then on the drilling sites, we clear those off, level them off and cover those with the aggregate, with caliche, and then we are ready for the drilling equipment to move in and then we did dig the pits.\textsuperscript{67}

Bentley described digging a series of large waste and oil runoff pits at each well. Even before obviously destructive gushers or salt brine washes left their mark on the region, the leveling of new roads and construction of campsites changed local geographies.

After the well site was prepared, drilling created its own pollutants. The clay-lined pits used to store oil, drilling mud and contaminated water often cracked and leached water contaminated with acid, nitroglycerine, and other chemicals into the surrounding soil. Such contaminates often reached nearby groundwater. The infiltration of groundwater with liquid oil waste was common in boomtowns that paid little attention to the location of human settlements, water wells, and drilling rigs. Oral histories described water that could be lit on fire, discolored water, and water that even livestock refused to drink.\textsuperscript{68}

\textsuperscript{67} George R. Bentley, interview, May 20, 1970, Monahans, Texas, Oral History Collection, Permian Basin Petroleum Museum, Midland, Texas, 12.
\textsuperscript{68} Dr. Myres, Berte Haigh, and J Ben Carsey, interview, October 9, 1970, Houston, Texas, Oral History Collection, Permian Basin Petroleum Museum, Midland, Texas.; This was a standard complaint nationally. Nancy Quam-Wickham, “Cities Sacrificed on
ground unstable, causing sinkholes. Often left uncovered, much of the oil stored in these pits would evaporate, obliterating months of work.69 Worse, oral histories described animals and people becoming trapped in them, drowning in vats of oil. Other oral histories and regional periodicals simply focused on the oily slick created by unchecked gusher wells.70 Emersion in crude oil destroyed wildlife habitats, cattle forage, and agricultural production alike.

Even after drilling was complete, extraction had consequences. A settled well that had been producing for a while was tellingly called a “stripper well” because the goal was to strip the last drops of oil from it. Oil workers used variety of different methods during the early-twentieth century to maintain well pressure in stripper wells including salt injection and the injection of specialized drilling mud into the well. These methods increased the well’s impact on local groundwater but kept wells producing oil for much longer than before. Much experimentation went into the development of these secondary recovery methods. One of the earliest methods, begun in 1915 and 1916 was to inject air followed by natural gas into the well. This process was ominously called “blowing” a well. James Delaplain described this practice, used in 1924 at the Seminole field in Oklahoma, “They’d compress air and put it down in the hole and through the casing and blow out through the tubing, or vice versa. Then they found pretty soon [sic] that that was

the Altar of Oil’: Popular Opposition to Oil Development in 1920s Los Angeles, Environmental History 3:2 (April 1998) 189-209.
69 Storage Facilities, Photos, Box 28, API Photo and Film Collection, Col 711, Smithsonian Archives Center, Washington, D.C..
kind of dangerous so they changed to gas, and they recycled the gas then and we
produced some natural gasoline that way with the compression and pooling of the gas as
we recycled it.” 

Delaplain’s assessment is a massive understatement. If the oxygen
injected into the well encountered certain subsurface gasses, blowing a well could result
in an impressive explosion.

The Permian Basin’s early oil companies maintained two pipelines with a capacity
severely inadequate for the amount of oil being produced. These pipelines were
rudimentary and often leaked crude oil, kerosene, and other petroleum derivatives into
surrounding desert habitats. This lack of transportation infrastructure instigated several
ey early experiments with large-scale oil storage techniques that also had a negative impact
on local ecologies. In 1928, at McCamney the Shell Oil Company attempted to build a
single, enormous storage reservoir to hold excess oil in anticipation of a pipeline to be
built connecting the Permian Basin to refineries in Houston. Like existing smaller tank
farms, this storage facility was constructed as a hole in the ground with a removable
cover. However, this massive tank was poorly designed. While in theory the concrete
liners would hold a million barrels of oil, the weight of the crude oil was too great for the
weak limestone bedrock underlying the pit. Cracks developed in the liner and the massive
tank began to leak. In 1929, the project was abandoned after no solution could be found,
with the pit becoming a local curiosity and tourist attraction.

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71 Boatright, Tales from the Derrick Floor, 223.
73 This was one of the few practices that sparked early regulation efforts. Gorman, Redefining Efficiency, 87.
74 Prissy Neill, “McCamney’s Million Barrel White Elephant,” Texas Historian, September 1976.; Roger M. and Diana Davids Olien (Oil Booms, Lincoln: University of Nebraska
At its most cataclysmic, insufficient waste storage at drilling sites and hastily constructed oil storage facilities brought fire. O. J. Lawson remembered fire danger as a constant hazard. Lawson documented that oil storage tanks were regularly placed too close together in an effort to save space. He also admitted that workers in the industry recognized that there was no good way to protect such tightly packed tanks from igniting after a lightning strike.\(^7\) Sometimes, the whole operation did catch on fire. Jack Knight described a disastrous 1919 fire in which lightning struck oil storage tanks and quickly spread to a nearby town, “And, this electric storm that afternoon, lightning struck that tank and just burst it wide open. That oil, just solid flame, spread out on that water, just enveloped those houses and drilling rigs and shacks of all kinds, clear down to Main Street and into this creek, burnt up so many people before they ever knew that there was a fire.”\(^6\) James Riggs remembered the extreme fire danger that was common among workers covered in oil and working near open flames:

We were working under - we were just saturated with oil - just a gusher going to the top of the derrick and falling back on us - working there trying to cap that well. At the same time, we didn’t realize it was so dangerous. We even had the boiler - firing a boiler within seventy-five yards of us, And today they wouldn’t think about doing a thing like that but we did at that time.\(^7\)

Once burning, oil provided a constant source of fuel for wildfires.

\(^7\) Boatright, *Tales from the Derrick Floor*, 194.; Texas newspapers were rife with sensational stores of towering oil infernos. “Millions of Barrels of Oil on Fire at Humble, Lightening Started Blaze Which Encircles Men Beyond Help,” *Austin Statesman*, July 24, 1905, Austin, Texas.; “$1,000,000 Loss in Latest Texas Oil Fire,” *Austin American*, November 18, 1926, Austin, Texas, Texas Oil Industry Scrapbooks, Briscoe Center for American History, University of Texas, Austin, Texas.

\(^6\) Ibid, 184. See also AP, “1000 Homeless After Oil Fire,” *The Houston Post*, November 11, 1919, Houston, Texas, 10.

\(^7\) Ibid, 174.; See also United Press, “Fight Oil Field Fire, One of 30 Tanks Ablaze at Monahans,” *El Paso Evening Post*, July 15, 1929, El Paso, Texas, 10.
Derrick fires could burn for weeks, quieting only when subsurface oil reserves had been exhausted. Without access to water or sufficient transportation equipment for fire brigades, these fires went largely unchecked, sometimes starting wildfires that swept across the desert. O. J. Lawson described the environmental consequences of early firefighting, “One of the standard equipment was a cannon that would shoot a hole in the side of the tank down close to the bottom and let the oil out in a dike.”78 Shooting a hole in the tank allowed the oil to flow out before it began to boil from the heat of the flames. If the oil boiled over, Lawson claimed that it would shoot fire two miles high, igniting the surrounding tanks and vegetation and burning for weeks on end.79

Many of these early hazards were documented by a wave of photographers who arrived in West Texas to capture the drama and chaos of a battle between oil workers and seemingly uncontrollable natural phenomena. Oil destruction was a source of national curiosity. Both the popular press and hired oil industry photographers created images of

78 Ibid, 194.; See also N. D. Bartlett, “He Handles ‘Sudden Death’ Without Fear,” Texas Oil Industry Scrapbooks, Briscoe Center for American History, University of Texas, Austin, Texas.
79 “Shooting a burning oil tank at a gushing field in Oklahoma,” 1948, Box 11B, Nation’s Business Photograph Collection, Audiovisual Collections and Digital Initiatives Department, Hagley Museum and Library, Wilmington, Delaware.
exploding gushers and crowded oil towns that would become synonymous with oil exploration for the next fifty years. Many, including the API and the magazine Petroleum Refiner, published photographs of Permian Basin landscapes denuded by salt brine.80 Walter Rundell Jr. also included photos of these ravaged landscapes in his book Oil in West Texas and New Mexico.81 Images of raging rig fires were sold as souvenirs and published in local newspapers and circulated by the API.82 Other photos showed derricks stacked upon derricks, sometimes inches apart and blocking out the sunlight. Yet others depicted rivers blackened by oil.83 Similarly, images of towns and roads covered in black oil became ubiquitous in the regional and national press.

Images of single gushers were the most popular. For example, an image of the University No. 3 at Texon, developed in the 1930s on University of Texas lands, as well as images of the gushing Santa Rita No. 1 near Big Lake became popular souvenir postcards.84 Somewhat counterintuitively, as early as the 1930s these images became widespread in industry magazines, albeit captioned with quick reminders that such wasteful tactics were rare.85 The majority of these photos, either of gushers, salt flats, or

80 Well Fires, Photos, Box 6, Box 15, Box 111, Collection 711, API Photo and Film Collection, Smithsonian Archives Center, Washington, D.C..
81 Rundell Jr., Oil in West Texas and New Mexico.
82 Disasters, Photos, Box 111, Collection 711, API Photo and Film Collection, Smithsonian Archives Center, Washington, D.C..
84 For some examples of early postcard ads see Jeff Spencer, Texas Oil and Gas: Postcard History (New York: Arcadia Publishing, 2013).
85 For example see “The Oil Industry’s Answers, Today,” Oil and Gas Journal, 1927, Trade Literature Collection, Smithsonian Archives Center, Washington, D.C.; Oil and Gas Journal: Golden Anniversary Edition, Trade Literature Collection, 110, Hagley Museum and Library, Wilmington, Delaware.
rig fires, did not include people, stopping short of implying a direct visual correlation between oil spectacle and human interference. The viewer was to marvel instead at the epic power of nature unleashed and then immediately harnessed through human technical prowess.\footnote{See also David Nye, \textit{American Technological Sublime} (Boston: The MIT Press, 1994).}

Some photos did include people. Humans were common in photos of oilfield fire. These came in two categories. The API commissioned a veritable sub-genre of photos depicting groups of men standing before massive, towering conflagrations. A second group depicted humans picking through the aftermath of fire – including the twisted remains of rigs, worker habitations, and local wildlife.\footnote{“Disasters – Fire- Derrick Leaning and in Flames,” Box 6, API Photo and Film Collection, Smithsonian Archives Center, Washington, D.C.. Neither the Smithsonian nor the API have consistent information about the photographers who took these images. It is left unclear just why the photos were commissioned. While some included captions clearly meant for press release, most include lengthier typed descriptions of well location and the technical processes displayed in the photo.} Although images of catastrophic industry failure, these photos did not suggest to Permian Basin residents that gushers, fire, or oily residue represented a problem that required outside intervention. Instead, these photos inspired awe at the spectacle such forces produced. Both categories invoked the awesome power of nature and bore witness to the limits of humanity’s ability
to control such power.\textsuperscript{88}

Contrasting these images of oil’s environmental destruction in the Permian Basin to the horrified reactions of landholders in the Pennsylvania oilfields of 1859 reveals fundamental differences in the ways in which different generations of agriculturalists reacted to environmental contamination. In 1859, “Colonel” Edwin Drake made the first major oil discovery in the United States near Titusville, Pennsylvania.\textsuperscript{89} The area became known as “the oil region” as boomtowns quickly sprung up in the remote region of Venango County. The first oil pipelines were built in 1879 in Chester County, Pennsylvania to transport oil from new fields in rural areas to the region’s growing network of small refineries. Cries of monopoly quickly erupted amid opposition to pipeline companies’ invoking eminent domain to cross private land. Several landowners sued.\textsuperscript{90} In 1883 Harrison Keiser described environmental destruction in the wake of pipeline construction on his farm:

\textit{The National Transit Oil Pipe Line runs through part of my farm. I have seen leaks on my neighbors’ lands and nothing has grown there since. I have seen where they burned the oil off the ground, and nothing grows there. I also saw where it burned the fences and a lot of fruit trees…I also consider tanks dangerous on account of taking fire.}\textsuperscript{91}

That same year Thomas S. Butler Esq. made a prophetic comment, “It is not only the first taking of the land that is damaging, but the uninterrupted right of the company to relay

\textsuperscript{88} Gushers, Disasters, Disasters, Photos, Box 6, Box 15, Box 111, Collection 711, API Photo and Film Collection, Smithsonian Archives Center, Washington D.C..

\textsuperscript{89} There is no evidence that Drake ever served in any military, let alone as an officer.

\textsuperscript{90} “Experience of Farmers, and Others Owning Land Along Pipe Lines Now in Operation,” Affidavits of suffering land owners, from devastations caused by pipe line companies, State of Pennsylvania, Union County, 1883, Special Collections, Hagley Museum and Library, Wilmington, Delaware.

\textsuperscript{91} Ibid.
and repair their pipes. It is the invasion and repeated invasion of the rights of a private
citizen by an insolent and soulless corporation, against which and for which no adequate
damages can be secured."\(^{92}\) These charges of invasion of private property rights by
uncaring corporations bear similarities to the debates about railroad construction at the
end of the nineteenth century. Their descriptions of rampant destruction foreshadowed
the tone of moral outrage in Ida Tarbell’s muckraker literature thirty years later.\(^{93}\)

Similar anxieties were seen in mid-nineteenth century magazines and
newspapers. A writer named B. Franklin in an 1865 issue of *Harper’s New Weekly
Magazine* described the oil fields of western Pennsylvania:

Rich farms are laid waste. The plow turns no more furrows. The scythe cuts no
more bending grain. The farmers’ farms are no more loaded down with the fruitful
harvest. The farmers himself, with his homespun clothes, is seen no more in the
fields. All is changed! The farm is sold! The old farmer and his grown-up sons are
worth millions, and the old homestead is deserted forever.\(^{94}\)

There was a general fear among the mid-nineteenth century middle class that new
industrial systems would bring about moral decay. News from the oil fields was given as
a prime example of this decay. The tall tale of “Coal Oil Johnnie,” the gullible prospector
who won a fortune only to lose it to ridiculous spending, became a national parable.
Stories featuring oilfield gunfights, brothels, gambling, drinking, and murder were

\(^{92}\) “An Argument on Behalf of the Citizens of Chester County (Owners of Lands Along
Proposed Route of Pipe Lines),” *Daily Republican Print*, 1883, 3, Hagley Museum and
Library, Wilmington, Delaware.

\(^{93}\) This anxiety extended beyond depictions of the oil industry. There was a general fear
that the search for excessive wealth would encourage dishonesty and moral corruption.
Many equated the lack of women in oil towns with vice. Karen Haltunen, *Confidence
Men and Painted Women: A Study of Middle-class Culture in America, 1830-1870* (New

\(^{94}\) “The Petroleum Region of America,” *Harper’s New Monthly Magazine*, 30 (1865),
569.
common. Good for selling copy, these melodramatic stories tapped into the anxieties of a rapidly industrializing nation. For Harper’s readership, the arrival of oil was a symptom of the industrial factory system which was eroding a national, pastoral identity.

Almost 100 years later, such anxieties had been decisively laid to rest. Oil’s environmental hazards regularly disrupted Permian Basin ranchers’ cattle operations. However, dependent on the oil industry to sustain their mortgages, these ranchers saw signs of oil contamination such as drinking water discolored by crude oil or the smell of suffer across pastureland as an opportunity to secure more oil leases.

This represented a larger reorientation of the Permian Basin economy in which the monumental discoveries at Santa Rita, Yates, and others, taught people to look for wealth below the ground rather than on top of it. Increasingly, land value, and the potential for economic self-sufficiency, was not based on simply having enough space per head to feed cattle, but rather on the ability to employ increasingly complex technologies to delve deep enough to extract an adequate quantity of oil. Further, this practice began to upend the regional hierarchy put in place by dry land farming and ranching in which the possible yield from the land was directly linked to the amount of land owned. In the petroleum industry, the surface area of the land was secondary to the depth of the oil deposit underneath. In the right of capture system of the late 1920s and early 1930s, landowners were more concerned with making as much money as quickly as possible than their impact on global oil prices or the quick depletion of regional oil

95 *Fame and Fortune Weekly*, 492, Folder ‘Publication – Magazine-Fame & Fortune Weekly,’ Box 5, Collection 60, Warshaw Petroleum Collection, Smithsonian Archives Center, Washington, D.C.; Photos, Box 9, Collection 60, Warshaw Petroleum Collection, Smithsonian Archives Center, Washington, D.C..
Locals may not have cared much about the contamination caused by overproduction, but the Depression exacerbated by East Texas wildcatters did cause some to reevaluate their opposition to federal intervention. Between 1930 and 1933, East Texas overproduction resulted in a sudden drop in exploratory drilling in the Permian Basin. During the second week of July 1933, drillers completed only three wells in the Permian Basin.\textsuperscript{96} Because many drillers depended on immediate profits to pay creditors and fund overhead costs for new drilling, they were caught in a bind with no escape until oil prices increased. Many small companies folded. Those that didn’t were fortunate to hang on to their assets. In an oral history interview, Permian Basin resident E. N. Beane explained:

> The depression hit us real [sic] bad. It really started in October of ’29 but didn’t affect Crane until the latter part of 1930, then it was pretty severe. Oil of course went to a dime a barrel and there was no progress at all during the latter part of ’30, ’31, ’32, and then in ’33 when Roosevelt took office, he came in with NRA, WPA, etc., it started back to prospering [sic] very slowly. It was real slow because people just didn’t have any money.\textsuperscript{97}

Waves of layoffs hit workers at oil drilling companies and support industries throughout the Permian Basin. As the region’s network of banks failed, small companies that had taken out loans to finance the cost of equipment rentals, labor, and drilling contracts were left with nothing. According to University of Texas oral histories, the Depression hit Texas’ contract labor the hardest. With little cash to go around, workers at small drilling companies were at times paid in groceries, free room and board, or simply promised a percentage of hypothetical profit from future oil discoveries. According to Ford

\textsuperscript{96} “Two Small Pumpers Are Completed in West Texas,” \textit{Oil Weekly}, 70:6 (July 24, 1933).

\textsuperscript{97} E. N. Beane, interview, June 19, 1970, Crane, Texas, Permian Basin Petroleum Museum, Midland, Texas, 10.
Chapman, “The reason they were called bean job, literally beans was [sic] what they lived on. I know one fellow, he was getting ready to start a well, and he told me, “Well I have a hundred-pound sack of beans [to pay workers]…. Then they’d put up tents…or shacks of some kind.”

Some of these workers quit oil and returned to low paying agricultural jobs. Others moved East, searching for factory work. Most lingered in the region’s boomtowns, hoping for better times. James J. Wheat described the impact of the Depression and the shame associated with working WPA jobs in Wink, Texas:

> Of course the WPA (was that it?) came in giving food and jobs. I remember truck loads of good stout men that had worked on drilling rigs, famous mechanics and ball players, and they would load up 2 or 3 truck loads of these men and they had an old dirt road between here [Mentone] and Wink and their job was to throw rocks out of the road. That was in 1933 and ’34.

Wheat remembered that most oil workers lingered in Mentone, congregating daily on the porch of the local drugstore because they had nowhere else to go and nothing else to do.

Despite its new authority, RRC efforts to reduce the oil supply and raise prices were largely unsuccessful. Although efforts to prorate oil extraction had been ongoing since the industry’s inception and although some form of industry regulation had been on the books in Texas since the 1910s, the state legislature was deeply wary of any government intervention into the oil business. As a result, the RRC was initially given little real authority, unable to either fine oil companies for overproduction or arrest violators. As a result, Texas wildcat drilling only increased sharply between 1930 and

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1935. Oil market volatility continued. Although the total supply of US crude oil did decrease during the 1930s, the number of speculative wells dug in the Mid-Continent region rose from 7,223 to 11,919 per year between 1931 and 1940.

As the Depression deepened, many people, including federal lawmakers, blamed RRC collusion with oil companies for the spike in drilling. Legislators spent the next decade pushing for federal regulation of Texas oil extraction. By 1934, even the staunchly anti-interventionist Amos L. Beaty, former president of the API, began pressuring oil executives to support government regulation. At the federal level, Harold Ickes, appointed as Roosevelt’s Secretary of the Interior in 1934, led a push to regulate oil as a public utility. Although the East Texas field had been brought under relative control in 1933, Ickes made it a personal mission to regulate oil, bringing a flurry of bills before Congress to regulate both extraction rates and oil prices. Ickes results

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100 A look at East Texas drilling rates demonstrates this regulatory ineffectiveness. Although the total supply of crude oil decreased, the number of speculative wells being dug in the Mid-Continent region increased from 7,223 to 11,919 per year between 1931 and 1940. American Petroleum Institute, “Statistical Bulletin, 1932-1940,” Washington D.C., n.d., Trade Literature Collection, Hagley Museum and Library, Wilmington, Delaware.
101 Ibid.
104 In 1933 Ickes backed the Marland Bill, calling for federal regulation of oil production. In 1934 Ickes again began pushing for further oil conservation legislation through the failed Thomas-Disney Bill. This move called for some in the industry to call for Ickes resignation. Harold Ickes, Fightin’ Oil (New York: Alfred A. Knopf, 1943).
were mixed. Three weeks after he was sworn into office, Ickes convened the governors from all “oil States” and recommended a complete moratorium on oil production until prices could be brought under control. Soon after, Ickes was placed in charge of Section 9 of the National Industrial Recovery Administration (NIRA) which managed interstate commerce and therefore regulated the movement of oil. However, in January 1935 the Supreme Court ruled Section 9 of the NIRA, and its provisions to regulate oil, unconstitutional. In a countermeasure, only two months later the Conally “Hot Oil” Act was passed on February 22, 1935 with Ickes as Administrator.  

Despite some popular support for his efforts, this legislative focus made Ickes enemies within the industry, and many enemies in West Texas. For many industry leaders, regulation by the relatively sympathetic RRC was a better option than federal oversight. Texas Railroad Commissioner Sterling saw these federal efforts as working to supplant the RRC’s new power. In 1933 and 1934 Sterling was joined by oil industry leaders who attempted to stave off regulation by proposing the formation of a new Interstate Oil Compact Commission. However, Ickes and Roosevelt felt that this would not amount to actual change and continued to push for a national conservation bill. Battle lines were drawn between a coalition of states’-rights and anti-regulation activists and a mix of resource conservationists and New Deal social reformers.

Permian Basin reaction to this debate was mixed. In the popular imagination, the people who bore the physical risk of oil prospecting were most often the people who

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106 “Oil Compact is Praised by Col. Thompson,” *Pampa Daily News*, November 11, 1936, Pampa, Texas, 3.
either won or lost from its discovery.\textsuperscript{107} This prevented unanimous support for intervention among working class people in the Permian Basin. In one popular narrative, the ability to take on personal risk and persevere over adversity meant that oil prospectors deserved the fortunes they made from oil.\textsuperscript{108} Monopolies were the enemy in this narrative as large oil companies were controlled a resource that, in theory, should be available to any with the will and stubbornness to go search for it. The physical risk that irresponsible extraction processes and overproduction posed to oil workers was considered a danger consciously chosen in the pursuit of profit. A version of this ideology was shared by government regulators who believed that while risk to the economy or risk to natural resources needed oversight, personal physical risk was a matter of individual choice and human autonomy.\textsuperscript{109} Placing the daily experiences of oil workers back into the debate over resource depletion reveals that while they had little direct control over federal policy, in the Permian Basin, oil workers individualistic sentiment and oppositional relationship with nature fundamentally shaped the regional ambivalence toward government intervention.

In interviews taken several decades later, former oilfield workers’ clearest


\textsuperscript{108} \textit{Saturday Evening Post}, 1920, Box 6, Collection No 60, Warshaw Petroleum Collection, Smithsonian Archives Center, Washington, D.C..

\textsuperscript{109} Efforts to unionize Permian Basin oilfield workers in the 1920s were isolated. Conversations about worker safety did not start until the 1940s. Melvin Rothbaum, \textit{The Government of the Oil, Chemical, and Atomic Workers Union} (New York: Wiley, 1962).
memories are of the job’s physical difficulty and the lack of safety equipment.

Descriptions of near-death experiences through explosion, drowning, asphyxiation, or dismemberment are ubiquitous. According to Bill Ingram, “Lots of people got hurt, oh Lordy. Lots of men got killed or crippled up, uncalled for. Through ignorance, a lot of it, and through unsafe equipment too, you know. Most of the accidents could be avoided, but people were ignorant of the danger and they’d just take chances.”\(^{110}\) Ingram’s statement was echoed by an anonymous informant who described both the natural and human-made dangers on oil rigs:

When wells were drilled in they were permitted to flow unchecked as a means of cleaning them out. There was no effective blowout preventer. Men without gas masks capped flowing wells using steel tools that might cause a spark. There were no steel helmets to protect heads from objects dropped from the derrick or steel toed shoes to protect the feet. Firefighting equipment was almost nonexistent. So was any kind of fire control. Workers carried lighted lanterns and struck matches for pipe lines and cigarettes where gas might ignite in smothering flame. Lightning at any time could strike open wooden or earthen tanks. Nothing had been invented that would control a well-spewing forth in flame. Poisonous gas collected in low areas, and there was no warning of its presence.\(^{111}\)

While some informants lamented lack of knowledge or attention to workplace safety and saw risk-taking as a personal lack of good judgment, others almost hyperbolically described the spectacle that catastrophic blowouts or well fires created:

We’ve seen many of those places blow out. We saw many, many wells blow out, come in and just absolutely obliterate the surface, and blow a hole in the ground twice as big as the platform that the derrick was setting on, and just make a mud pie out of it. It’d blow those casings, and also the drill stems, blow them into the air and they’d break into pieces, two and three and four joints apiece, and then fall back and a whole joint would stick into the ground all the way, halfway up, and break off and bend. We saw many, many of those happen.\(^{112}\)

\(^{110}\) Boatright, *Tales from the Derrick Floor*, 176.

\(^{111}\) Ibid, 172.

\(^{112}\) Ibid, 189.
Similarly, William Joseph Philp described a driller named Bert Rambeau who was killed when his drill pipe got stuck in a well. Rambeau reversed the drill engine and the rig collapsed on him, killing him instantly.\textsuperscript{113}

“Shooting” wells using nitroglycerine or dynamite charges was a common way to break up subsurface rock strata. It was also one of the most dangerous practices involved in oil drilling and a common topic in oral histories.\textsuperscript{114} Stories of nitroglycerine accidents were common. Before the development of well flooding technology, oil companies contracted specialized “shooters” to transport and handle the dangerous substance.\textsuperscript{115}

Nitroglycerine’s extreme, explosive volatility meant that canisters often blew up in transit, blowing apart transport wagons and their occupants. Sometimes the charge detonated early, killing the drillers and flattening oil rigs.

Oil workers strived together in opposition with nature and, as such stories demonstrate, proficiency with technology mattered at a life-and-death level. Successfully avoiding workplace hazards gave oil workers a sense of control in a volatile space. Social hierarchies and a sense of workplace community were built upon the competent use of machines to avoid danger. Many oilfield hazards were beyond human prediction – caused by uncontrollable geology and the environmental conditions developed over millions of years.

\textsuperscript{113} Ibid, 174.

\textsuperscript{114} Drilling Notes, Box 2.207/E220, EXXON Mobil Historical Collection, Briscoe Center for American History, University of Texas, Austin, Texas.; David F. Dixon, “Risky Business: Oil Well Shooters in the Southwestern Oilfields,” The Southwestern Historical Quarterly 114:1 (July 2010) 1-19.

\textsuperscript{115} Boatright, Tales from the Derrick Floor, 218.; C. O. Rison, “Manufacture of Nitroglycerin and use of High Explosives in Oil and Gas Wells,” The American Institute of Mining and Metallurgical Engineers, reprinted from Transaction, Petroleum Development and Technology, February 1929, New York, Trade Literature Collection, Hagley Museum and Library, Wilmington, Delaware.
years. While weather, subsurface pressure, and aridity could not be changed, machine malfunction could largely be prevented at the individual level through increased experience operating and maintaining industrial technology.

Oral histories emphasize that workers did not wear specialized protective clothing or breathing protection and informants were quick to narrate the consequences. Sometimes workers died of exposure to gasses coming from the ground. Oil fields at Spindletop, Sour Lake, Saratoga, Batson, and Humble were all known to contain sulfur gas. This gas was poisonous, causing blindness and death depending upon the length of time exposed. J. A. Rush explained, “If you got two or three good whiffs of it just knocked you out. I was knocked out with hit. It was at Batson…we didn’t have any gas masks then. You just had to try to hold your breath if you was [sic] in it till you could step out and breathe.”\textsuperscript{116} Frank Hamilton remembered placing Irish potato slices on his eyes after exposure to gas to prevent blindness. He met with slow success, with his eyesight returning over a period of weeks.\textsuperscript{117} The long-term effects of chemical exposure, which would become the industry’s biggest problem later in the century, were not mentioned in oral histories. The cumulative impact of exposure showed up many years later and informants were not asked about any suspicions of a direct connection.

Similarly, many oral histories emphasized the physically exhausting nature of the work, with drills running 24 hours a day, 365 days a year. The complete lack of days off work, sick leave, or holidays was regularly brought up. Fred Jennings described his

\textsuperscript{116} \textit{Tales from the Derrick Floor}, 181.
\textsuperscript{117} Frank Hamilton, interview by Mody Boatright, July 29, 1952, Sour Lake, Texas, Oral History of the Texas Oil Industry Collection, Briscoe Center for American History, University of Texas, Austin, Texas.
experiences, “Well, we had no vacations. We didn't know what that was [sic]. I ran a drilling rig for twelve months, seven days a week for one year to a day without loss of a day. That's right. No overtime [pay]. We didn't know what that was. No.” Individual competence and skill helped workers survive without protective equipment. Similarly, while sudden explosions or invisible toxic gas were beyond worker’s control, mastery over exhaustion, hunger, boredom, and isolation demonstrated masculine fortitude, physical stamina, and commitment to other drillers and to job completion.

A fundamental part of becoming good at oil extraction, navigating fire, explosion, corrosive chemicals, toxic fumes, and other hazards brought workers into intimate contact with the natural forces they were working to combat. Nature’s explosive volatility – especially the inexhaustible rush of oil from a gusher – was a source of awe. Engaging these forces daily, workers developed a very close relationship with nature that was at once respectful and fundamentally oppositional. This intimate relationship followed workers out of the oilfields. Curt Hamill described coming home from a job covered in crude oil, wiping off the majority with flour sack scraps, and using a communal pot of boiling water to scrub off the rest, “We first rubbed the rough oil off with sacks or cloth

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118 Fred Jennings, interview, June 19, 1952, Goose Creek, Texas, Oral Histories of the Texas Oil Industry, Briscoe Center for American History, University of Texas, Austin, Texas.

of different kinds, because you couldn’t wash it off. And we would rub that oil off of us. And then, after we’d rubbed it off, we would bathe in warm water or water as hot as we could stand it.”

Rather than alienating workers from the natural landscape, the daily processes of oil extraction gave drillers and workers intimate appreciation for the ecologies in which they worked. Not only did looking for oil require knowledge of groundcover, geology, and topography, the ability to “read mud,” and the competent operation of heavy machinery, successful drilling necessitated a healthy respect for nature and its dangers.

As the industry expanded and these dangers became familiar, oil and the subterranean world became knowable and was brought seemingly under human control. This process of knowing and controlling was mediated through machines. George R. Bentley described the process of transitioning a well site from initial drilling to long-term production. First, Bentley filled waste and runoff pits. He then buried or burned waste oil and drilling mud. Lastly, he graded and leveled a road leading up to the well. He did all of this with help of heavy machinery, “In preparing these drilling sites it talks a considerable amount of equipment to do it. Especially in the mountain country you have air compressors and we do lots of explosive work and it takes tractors, motor graders, air compressors, water trucks, haul trucks, and the necessary amount of construction equipment to do this.” Bentley argued that specific knowledge of the regional geography and topography was fundamental, “You have to go out and look at these drilling sites and road sites and locations, depending on the area. Then you have your

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120 Ibid, 107.
estimate men and we go out and figure the distance, the time involved and the cost of it and the quantities.” Such work transformed the oilfield landscape from a site of unknown wasted nature and potential physical danger into an ordered, predictable node within the larger web of global oil production.

In oral history interviews, former oilfield workers described with disdain the hazards caused by worker incompetence or inattention when operating machinery. Informants spoke with pride about their acquisition of technical knowledge and ability to manipulate complex machinery under extreme conditions. Demonstrated drilling talent and knowledge of the land led to promotion and pay raises. By the same token, mistakes, lack of skill, drunkenness, or unacceptably reckless behavior led to termination or, sometimes, death. On the job training was easily accessible. Fred Jennings, described his advancement through this informal system:

Well, I started in as a roughneck, December 27th, 1916, and I worked on the floor as a roughneck. And then I --for a short while -- about three months -- and then I worked derricks. .... Well, a derrick man got 25 cents a day more than the men on the floor got... he had more responsibility in the derrick than he had on the floor.... He was supposed to know more than the men on the floor. That's why he got that big 25 cents more.

There was a common belief that upward mobility, if not extreme wealth, was possible through drilling. According to Mody Boatwright, “From the beginning a man could work his way up — from tool to driller, from boil weevil to pusher, to owning a rig, a well, a

122 Ibid.
123 Allen W. Hamill, interview by William A. Owens, September 2, 1952, Tulsa, Oklahoma, Oral Histories of the Texas Oil Industry Collection, Briscoe Center for American History, University of Texas, Austin, Texas.
124 Fred Jennings, interview, June 19, 1952, Goose Creek, Texas, Oral History of the Texas Oil Industry, Briscoe Center for American History, University of Texas, Austin, Texas.
producing field.” Those with technological skills quickly became recognized elites and were able to pick and choose their rig crews and the most desirable jobs. Despite Mody Boatright’s idealistic words, this upward mobility only extended so far. Roughnecks rarely became the owner of their own drilling rig and almost never moved into the white collar world of petroleum engineering or geology.

This glass ceiling was related to the nomadic nature of the job. George Bentley, who worked a variety of jobs in the West Texas oil industry during the 1920s and 1930s remembered working as a laborer in an oil machine shop in Brackenridge, Texas; for the Humble Oil and Refining Company in Throckmorton County; for the Kellogg Drilling Co.; for the Red Bank Oil Co as a tool dresser in Iraan, Pecos County, Texas; for a Mr. C. L. Dittman in McCamey, Texas; as well as in Grandfalls, Texas, and in New Mexico over the course of his career. Bentley’s continued employment hinged upon his good name. However, seasonal and temporary work did not lead to the accumulation of cash savings or mortgageable capital. The ability to pool money to fund a drilling operation was rare. Land ownership or college education even rarer.

Along with shared technical experience, physical danger and economic

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125 Boatright, Tales from the Derrick Floor, 199.
127 In the 1920 and 1930 US Census, college education rates are demonstrably lower in West Texas than in the more urban eastern half of the state. This trend does change as engineers and geologists become more important to the industry. College completion data from the 1940s and 1950s indicate a steadily rising white collar population in more urban counties such as Ector and Midland. Similarly, the total number of dwellings is very small in West Texas relative to the number of single, male individuals in the population. US Census Bureau, Census of the Population and Housing 1920, 1930, 1940, 1950, accessed June 5, 2017, https://www.census.gov/prod/www/decennial.html.
uncertainty solidified both camaraderie and hierarchy among workers. Promotions were given to those who used hands-on knowledge of the landscape and machinery to ensure the safety of the crew and completion of the contracted job. In the process, oilfield workplace culture helped solidify a region-wide appreciation for humanity’s power to alter and subdue nature. A similar emphasis on physical danger, job impermanence, and focus on technological development was expressed by informants who had worked throughout the oil industry’s many adjacent industries. Workers like Fred Jennings participated in many parts of the drilling process, either as a driller, roughneck, or general laborer. Other worked in machine shops or on pipeline gangs. Many others worked on adjacent well maintenance crews, preparing well sites for drilling or transitioning drilling sites into producing wells. All of these jobs required extensive knowledge of local geology, surface geography, and climate. These were physical jobs that required strength, endurance, and long hours outdoors. Such experiences provided many with a sense of masculine pride and ownership over their jobs and the region. Such a sense of ownership probably helped temper concern as workers irreversibly changed the landscape, contaminated waterways and killing already-sparse vegetation, before moving on to their next job site.

128 Direct experience working on oil rigs was not always a precursor to a drilling job. The slow mechanization of farm work over the previous decades gave rural migrants an edge over those arriving from urban areas. Nancy Quam-Wickham, “Rereading Man’s Conquest of Nature: Skills, Myths, and the Historical Construction of Masculinity in Western Extractive Industries,” in Ed. Horowitz, Boys and Their Toys, 91-108.
129 Fred Jennings, interview with William A. Owens, June 19, 1952, Goose Creek, Texas, Oral History of the Texas Oil Industry Records, Briscoe Center for American History, University of Texas, Austin, Texas.
With this workplace culture in mind, in which local laborers understood themselves to have most complete, intimate knowledge of the land and of the process of oil production, it is not surprising that some oil workers and landholders described early efforts at industry regulation in the 1920s as an intrusion upon their hard-earned authority. Calls to regulate extraction were seen as an infringement on localized knowledge and the individual’s ability reap the rewards of sustained physical risk and hard-acquired skill. Labor historians have discussed the social logic behind worker pushback against top-down workplace safety regulations in the late-nineteenth and early-twentieth centuries. As seen in the railroad and steel industries, the creation of new safety laws was seen by some workers as a loss of control and a reduction of worker autonomy. Historians have argued that in the late nineteenth-century social respect among railroad and rail yard workers was based in personal competence and overcoming job dangers. Oil drillers’ reaction to industry regulation often held a similar ambivalence.

By the second half of the 1930s, the Permian Basin oil industry began to

rebound. Prices stabilized and drilling resumed. In 1934, the Abilene Report News announced the expansion of exploratory drilling in many Permian Basin fields.\textsuperscript{134} Several new fields were discovered in the Permian Basin during the late 1930s, including the large Goldsmith field in 1935. That same year, Gulf Oil, one of the region’s major leaseholders, came under federal investigation for monopolistic control over several pipelines.\textsuperscript{135} However, extensive exploration near Odessa in Ector County made the region a national leader in drilling and oil production. By 1936 and 1937, after the discovery of the Foster Field, industry publications reported a new boom in the Permian Basin.\textsuperscript{136}

This renewed exploration helped the region weather the Depression. In the 1920s, many large oil companies had taken out expensive drilling leases in the Permian Basin. Most of these leases only lasted ten years and their contracts were set to expire in the late 1930s. As a result, oil companies were contractually obligated to drill despite still-low oil prices and a continued lack of regional oil transport or storage infrastructure. Majors contracted these jobs to small independent drilling companies, cutting the costs of moving their own equipment to such an isolated area and helping local companies to stay in business.\textsuperscript{137} For example, in 1936 local independent Ed Landreth combined drilling contracts from twelve majors including Gulf and Humble to complete significant

\textsuperscript{134}“Outside Tests Hold Interest in Ector,” Abilene Reporter-News, Abilene Texas, December 9, 1934, 10.
\textsuperscript{135}Clippings, Box 76, Harvey O’Conner Collection, Walter Reuther Library, Detroit, Michigan.
\textsuperscript{136}“4 Completions in County for 4,976.03 Barrels,” The Odessa American, September 7, 1938, Odessa, Texas, 8.
\textsuperscript{137}This process is called a “farm out” and became an increasingly common way for large oil companies to avoid risky oil speculation. Olien and Hinton, Wildcatters, Chapter 4.
exploration in Gaines County.\textsuperscript{138}

As the Permian Basin economy rebounded, those who could get oil work were paid well. Drilling company owner James “Pete” Williams of San Angelo remembered working twelve-hour shifts drilling in Glasscock County for Phillips Petroleum, but pointed out that his company paid drillers and tool dressers between $11 and $12 which was “the ordinary wages then for drilling crews.” Williams explained that drillers hired the crews on an informal basis, without written contracts. He described one crew during the 1930s, “Our crew worked 8 hours and we paid them $2 a day cash and $6 a day out of oil and every one of them got their money.” By comparison, the US Department of Agriculture recorded that in July 1935 the average monthly wages for farm labor was $15.67, including board. While this number increased to $17.33 during the October harvest, the $56 per month Williams’ paid for working on the rigs represented a massive pay increase.\textsuperscript{139}

Companies that continued to drill in the mid 1930s found oil discovery to be a mixed blessing. The halt of outside capital after 1930 ended pipeline construction in the region. Olien and Hinton described a Mr. Furman who struck oil in Andrews County in 1930. However, because of the oil’s low quality few companies were interested in his stock. The only nearby pipeline was owned by Humble which also refused to pay to

refine such low-quality oil.\textsuperscript{140} Furman was ultimately forced to cap the well and wait for more hospitable times. Although Humble and Gulf did not want to invest in Fuhrman’s low quality oil, in 1938 and 1939 both continued exploration in the Permian Basin looking for high-grade crude, drilling in Crocket, Pecos, and Crane counties.\textsuperscript{141}

The industry turnaround, as well as the highly publicized, short-term success of localized proration, seemed to validate Permian Basin ambivalence toward federal intervention. Throughout the crisis, the local press had remained militantly optimistic about a rebound. Just before the crisis, on April 14, 1929 the front page of the \textit{Abilene Reporter News} discussed industry self-regulation in the West Texas “oil empire” as helping to fix the overproduction issue.\textsuperscript{142} Such optimism was seemingly rewarded. The industry revival in 1935 instigated a renewed flurry of industry boosterism in the region’s newspapers. By Dec 10, 1938 the \textit{Abilene Reporter News} ran an article describing a meeting from the Mid Continent Oil and Gas Association, insisting “Nothing is wrong with the oil business, we just have supply exceeding demand” and asking for locals to support lower oil industry taxes.\textsuperscript{143} Opposition to federal intervention continued.

Dismissing of federal and state efforts to stabilize oil production might seem illogical and potentially damaging to locals’ own interests. One could argue that working-

\textsuperscript{140} \textit{Wildcatters}, Olien and Hinton, 69.
\textsuperscript{142} “World Move to Stabilize Oil Industry Aids West Texas,” \textit{Abilene Reporter-News}, April 14, 1929, Abilene, Texas, 5.
\textsuperscript{143} In the article, the MCOGA provided numerous statistics reminding locals that the oil industry made up the majority of the tax base for oil producing states. “At W. T. C. of C. Convention - J. C. Hunter Discusses Unequal Tax Burden Imposed on Oil,” \textit{Abilene Reporter-News}, April 26, 1938, Abilene, Texas, 17.
class oil personnel were duped by booster narratives of regional importance and swayed by unrealistic dreams of short-term personal wealth. However, the situation was more complicated. In West Texas, voluntary proration was understood as saving the region from complete oil depletion and price instability. Relationships between workers and drilling companies were based on mutual hardship, shared danger, and individual reputations for endurance and competence. Small drilling companies and local landholders saw further exploration as the only way to pay off existing debts and most of the region’s large landholders depended on exploratory leases for supplementary income. In this climate, small oil companies convincingly argued that state-mandated proration unfairly favored larger companies. Federal efforts to conserve the oil supply, they argued, were not responsive to localized contingencies and would have a disastrous impact on small producers working to recover from the crash of 1929 and 1930.

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The competing perspectives of oil workers, federal conservationists, and industry officials demonstrate the overlaps and disconnects between a desire for industry efficiency and stability, a push for resource conservation, and preference for individual accountability and autonomy that would buffet the industry for the rest of the century. During the 1930s, with knowledge of oil’s finite nature and the industry’s wasteful

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144 Despite the fact that these early regional efforts at proration and unitization were only possible because the region’s oil fields were controlled by a few large producers who could easily work together to experiment with controlled coordinated production, this voluntary effort was praised as revolutionary throughout the industry.

145 This was a state-wide accusation. For example, on April 3, 1929 the Galveston Daily News published an article arguing that regulation by the Texas Railroad Commission would give an unfair advantage to large oil companies. AP, “Hoover is Opposed to Oil Curb Plan,” The Galveston Daily News, Galveston, Texas, April 3, 1929, 1.
practices in the popular consciousness, efforts at state intervention became bogged down in an ongoing debate about land ownership and the sanctity of the free market. The ability of humans to fully predict and control the natural world sat at the heart of both federal and state efforts to curb speculation and wasteful extraction. However, while opponents of the industry saw overproduction as an indication of rampant greed and an inattention to long-term consequences, oil workers also saw the industry as a source of lucrative employment. In the Permian Basin, this perspective was embedded in established labor hierarchies and an individualistic, oppositional relationship with nature. Extreme job danger meant that competence, physical dexterity, and manual skills were keys to quick promotion and a place in the community. Industry loyalty and the need to pay debts made locals reluctant to entertain outsider regulation.

At the national level, industry efforts to avoid external regulation would be partially successful despite the constant threat of further federal intervention. However, those concerned that regulated extraction would strengthen large-company control over the industry were also proven correct. In the Permian Basin, Depression-era bank closures and lack of capital resulted in the consolidation of the industry under fewer large companies. The region became even more dependent on absentee investment and even more of the local economy became tied into the oil industry. In the process, battle lines were drawn in the conversation about resource use that held for the rest of the twentieth century: anti-monopoly activists were pitted against environmentalists in a tradeoff between small producers who had fewer technical resources and multinational corporations who offered efficiency and reduced waste.
Chapter 3
Producing Petroleum, Producing Civilization

In the first years of the twentieth century, oil prospector Chancy A. Moon exclaimed, “Petroleum is the oil of progress. Producing petroleum is producing civilization.” Thirty years later, many in the Permian Basin probably agreed with these words. As the industry expanded once again during the late 1930s and 1940s, oil companies helped to build roads, phone lines, water wells, and sewage systems that connected the region’s towns and cities. Despite national economic doldrums, during the Depression the Permian Basin’s two largest oil towns, Odessa and Midland, became important oil processing and industry administrative hubs. This was due largely to the growing network of pipelines and roads that connected far-flung oilfields with these population centers. In the national popular press, opponents of industry consolidation and monopoly control continued to accuse oil companies of greed and resource waste. However, by the end of World War II, for many Permian Basin residents this assessment had been tempered. Making few distinctions between small, local companies and large multinationals, the regional press explained oil companies’ efforts to reduce risk through better control over the natural world as “improving” the desert. Such associations competed with older cultural connections between oil, scheming prospectors, and violent, dangerous transients. In newspapers, at Chamber of Commerce meetings, and in regional

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economic development committees, oil was described a tool of technological modernization that provided needed public utilities and infrastructural development.

In this chapter, I track the impact of increasingly complex oil transport technologies on regional communities. Focusing on the period between 1933 and 1945, I argue that the Depression and World War II helped to speed up oil’s control over the regional environment, a process that would ultimately displace cattle ranching as the driver of the regional economy and political hierarchy after the war. I begin with accounts of the notoriously lawless, dirty, and overcrowded oil towns of the 1920s. These oil communities were intentionally temporary, with most workers understanding that they would quickly deplete any easily available oil and then move on to the next field. This perspective reinforced a lack of concern about environmental contamination or sustainable economic development and contributed to swift resource depletion in the industry’s early years. While shared workplace danger continued to bind oil drillers together, the boomtown mentality slowly dissipated as oil companies invested in infrastructure which allowed drillers to live in towns year-round. Simultaneously, new refineries and processing facilities introduced a settled class of skilled workers to the Permian Basin. Better infrastructure increased the region’s population of oil administrators, businessmen, and promoters. Shopkeepers, innkeepers, and other retailers set up operations.

Residential and urban development was closely linked to the growth of industry infrastructure. The region-wide lack of reliable water was a marker of community instability for many early residents. The creation of better water transport and pumping systems was central both for the region’s oil extraction operations and for human
survival. Advances in the technology and labor of pipeline creation and maintenance during this period facilitated the spread of early refining efforts. This complex techno-capitalistic system took a geographic and environmental toll on adjacent ecologies and on the communities who built it.

Racial hierarchies were imbedded within this process of “regional improvement.” New, middle class arrivals built civic organizations and promoted standing law enforcement, hardening what had been relatively fluid barriers of race and class in the region’s oil towns. During the first half of the twentieth century, the Permian Basin oil industry was much more segregated than the ranching economy. As early cities expanded, settled communities of refinery and gas plant workers built segregation into processes of urban growth, pushing black and Tejano populations into unincorporated exurbs nearest newly built refineries and far from commercial centers. In the 1930s, federal and state officials began deporting many West Texas Latinx and Tejano residents, building upon a 100-year effort to cleanse West Texas of its connections to Spanish America.2 Scholars have documented the uneven impact of trade networks and industrial

infrastructure in the Southwest borderlands. Others have demonstrated how systems of unequal growth influenced the development of Texas capitalism, state politics, and the rise of the religious right. This history was at play in the Permian Basin. Technology and infrastructure became simultaneously tools of wealth generation, markers of local prestige, and strategies to reinforce racial hierarchies brought from the Confederate South to far West Texas.

Working-class oil communities were largely complicit in these developments. As oil’s roots in the region grew deep, and with the industry better stabilized by the Texas Railroad Commission and other regulatory bodies, extractive infrastructure further increased large company control over regional industry, making it more efficient and less

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5 While the Permian Basin seceded with the rest of Texas during the Civil War, the region’s low population and desert climate helped to thwart plantation agriculture and slaveholding capitalism in the region. Armando Alonzo, *Tejano Legacy: Rancheros and Settlers in South Texas, 1734-1900* (Albuquerque: University of New Mexico Press, 1998). During the twentieth century, Texas’ political and economic structure was inextricable from racial segregation and discrimination --first as the slave economy and later as cotton sharecropping trapped much of Texas’ black population in systems of debt peonage. Chandler Davidson, *Race and Class in Texas Politics* (Princeton: Princeton University Press, 1990).
dangerous. While some landholders voiced opposition to the loss of control, others saw industrial connectivity as an opportunity to build better homes, improve their health, and have access to community and “respectable” entertainment. Such analysis complicates Olien and Hinton’s assessment of the Depression Era as a battle of attrition between the region’s small oil producers and increased government regulation in the Permian Basin. Building upon tensions formed the 1920s, residents worked to balance outsider regulation, waste reduction, and environmental protection against a deeply-felt desire for local, individualized control and belief in the modernizing power of industry.

Regional infrastructure-building efforts reached a tipping-point during World War II as the sudden, extreme need for more oil led to a partnership between the federal government and large oil companies in an effort to expand the region’s oil pipeline and transport networks. This wartime infrastructural buildup set the stage for massive postwar industrial growth in the Permian Basin, especially in the production of petrochemicals and synthetics. Large companies and federal investment provided the capital necessary to build refineries and other infrastructure in the region. Such expedient cooperation during World War II led to a regional drop in the number of small oil producers. Newly enforced conservation laws extended the life of the region’s oilfields in the late 1930s and 1940s and oil work became less dangerous and isolated. At the same time, the region’s oil towns foreshadowed the segregated, pro-business, New South of the postwar era.

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Beginning in the early 1920s, oil companies built dozens of company towns and work camps throughout the Permian Basin. Existing railroad settlements and ranch

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6 Olien and Hinton, *Wildcatters*. 
supply depots became boomtowns, overrun with oil prospectors, wage laborers, and camp followers.⁷ Big Lake, closest to the Santa Rita discovery, Odessa, Midland, and San Angelo were quickly overwhelmed. Other towns were established overnight due to the boom. The Texon Oil Company established the town of Texon in 1923 halfway between Big Lake and McCamey to service this influx of oil prospectors. Texon, Texas reached a population peak of 1,200 in 1933. Iraan was founded in 1926 after the discovery of oil on ranch land owned by Ira and Ann Yates. McCamey, established in 1925 by the Corpus Christi real estate firm Baker No. 1, jumped from a population of zero to 10,000 in just six months.⁸

Oral histories focus on the congestion and confusion in boomtowns as the sudden population influx strained the region’s scarce resources. In overcrowded oil towns, a general lack of housing was a constant burden. In one year, the Texas Panhandle town of Borger grew from a population of zero to a city of 20,000. Earl Snider remembered the rough conditions, “There was tin shacks grew [sic] up all over town. Bed cots rented for a dollar and a half…and they

was [sic] rented with hours, on an eight-hour basis, and you got up and your eight hours was over, and somebody else took the cot; that’s’ the way it was run. And the walls was so thin that when you had the dust storms, it was a pitiful situation in here [sic].”

Photographs further revealed the chaotic and dirty conditions in Odessa, San Angelo, and Big Lake. Some depicted muddy streets clogged with Model Ts, signs for pool halls that rented out tables as shared beds, and crowds of men in dirty, shabby clothes milling around. Others documented lines of haphazardly spaced shacks built from found or scavenged materials.

While Permian Basin towns were overrun with prospectors looking for work or news of the next oil discovery, most oil workers did not live in these communities while on the job. West Texas oil was discovered far from existing communities, in the middle of private ranchland or on undeveloped state property. The region’s sandy, rocky terrain made transportation to and from these job sites extremely arduous. Many oil companies built temporary, on-site work camps to house drillers, their assistants, and any engineers, surveyors, and geologists working on the rig. The Big Lake Oil Company Camp was established between Big Lake and nearby Rankin to house the exploding worker population. Similarly, Gulf Oil, Humble Oil, and Phillips Petroleum set up work camps in the area.

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9 Boatright, *Tales from the Derrick Floor*, 103.
Workers in these camps lived in canvas tents or tin-roofed houses for months at a time. Drilling a single well took an average eight to twelve months. The rig crew would then move on to the next job site after a quick top in the nearest town and, often, the nearest bar.\textsuperscript{12} Michael McLeaish who grew up in the Gulf Oil Camp summed up the harsh lifestyle, “They say fences made good neighbors. Well, we didn't have any fences.”\textsuperscript{13} This statement recalled both a lack of privacy in his oil camp community of about 50 people. When oil companies did not provide housing, workers built their own residences from any available materials including tin, cardboard, canvas, brick, and the region’s scare supply of wood. While workers who brought families were sometimes provided single tents, unmarried workers bunked together in groups. Most often, the company provided food and everyone in camp ate together in communal dining halls. Designated bathing or toilet facilities were only available in some camps.\textsuperscript{14}

Throughout the 1920s, lack of good roads or telephone lines made communication between these camps intermittent at best. Aside from the region’s two railroads, there were few paved roads. The region’s network of dirt roads was often flooded or drowned in sand. Most supplies or visitors arrived on horseback, mule train, or via oxen-led wagon. Without paved roads, sand storms and thorny scrub forest made most drilling

\textsuperscript{12} In an oral history interview E. E. Brackens estimated that average well life during this period was six to seven months. E. E. Brackens, interview, July 16, 1970, Wink, Texas, Oral History Collection, Permian Basin Petroleum Museum, Midland, Texas.; \textit{Tents and Shacks}, Box 14, API Photo and Film Collection, Collection 711, Smithsonian Archives Center, Washington, D.C..
\textsuperscript{14} \textit{Oil Camps}, Box 9, API Photo and Film Collection, Collection 711, Smithsonian Archives Center, Washington, D.C.
locations inaccessible to early automobiles. By the end of the decade, improvement in automobile technology made these trips easier. However, cars still had trouble navigating the terrain. George W. Ramer remembered that the town of McCamey was established in Upton County due to bad transportation and mounting frustration:

I think they first set up tents to a great extent; anything so that they wouldn’t have to drive back and forth. Rankin had accommodations for a few over there, but it was still a small town and all that could get in there went there. Fort Stockton was soon overflooded and overwhelmed with people from here driving back and forth over a dirt road that was next to impassable when it rained.

Odessa native Bobby Weaver described driving to the oil fields in the 1920s as a two-person operation in which one person drove while the other repaired the car’s constant stream of flat tires and dug the car free from omnipresent sand bars.

According to E. N. Beane of Crane, Texas, “When we first started this thing out here [oil exploration] you would start from Odessa to Crane and there were several alternate roads that you could take but maybe you wouldn’t get through on any of them without getting stuck in the sand.”

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15 Mud, Box 25, API Photo and Film Collection, Collection 711, Smithsonian Archives Center, Washington, D.C..
Oil, described using horses and oxen to move pipe and heavy machinery after roads became impassable. Photographs from the 1920s illustrate these harsh traveling conditions. The API, the Sun Oil Company, and the Office of War Information all developed archives of images depicting scenes such as roughnecks braving sandstorms on foot and isolated derricks half buried in shifting dunes.

Unreliable transportation made lack of water one of the most pressing problems in oil camps. Groundwater in many oil-producing areas was contaminated with oil, sulfur, and other minerals, making it either unsafe or unpalatable for drinking. James Wheat remembered that while humans were advised not to drink the water, it was passable for livestock – after they had a few weeks to become acclimated to it. Securing access to potable water for drinking, washing, and oil drilling was a constant concern and workers had to deal with less than ideal conditions. W. W. Allman remembered the constant search for drinkable water:

While we were on the rig, we were walking about a mile to an old ranch house and it had a cistern. We found water in it so we run a bucket down there and bail us out some water and we had been drinking that water for I guess a month. One day we sat down and it was hot and I went after water and when I went down to get my water I bailed out half of an enormous, big old rat. It had already rotted in the water. Well, I just threw him out and went back after another bucket and went back to the well and I told the tool dresser, “Well, I’ll tell you what, I bailed out a dead rat, and here’s some of the water. What are you going to do about it?” He

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said, “I’ll drink it boy. I’ve got to have water.” He did too, and I did.\textsuperscript{22}

Local capitalists were quick to cash in on the ever-growing market for fresh water. The high cost of water in the Permian Basin was an often-repeated anecdote in oral histories. Popular consensus was that the best water came from the town of Alpine, approximately 150 miles to the south near the Davis and Chisos mountains. Permian Basin towns and oil camps depended on this water for survival. Many remember water being more expensive than oil. George Ramer recalled water being sold for $1 a barrel and that “oil was only bringing $.60” for the same amount. Ramer described the coordinated business of water selling:

\begin{quote}
The Kirby Brothers were quick enough to see the opportunity and they set up a little tank down on the railroad where they unload a tank car or two tank cars of water and every day they would get tank cars of water from Alpine. They had a fleet of little Model T trucks with tanks on them and they were the suppliers of the town.\textsuperscript{23}
\end{quote}

W. W. Allman had a similar account, “Well, you’re here [Crane, TX] water was brought in from McElroy…and it cost $1 a barrel. The water from Alpine cost $1.65 a barrel; it was a little better water. And you didn’t throw it away. If a cow or horse got their nose in that barrel you didn’t throw it away. You kept it.”\textsuperscript{24} In the Permian Basin, water was both a life-sustaining necessity and a lucrative business opportunity.

The lack of water increased sanitation problems in the region’s overcrowded towns. The inability to bathe or wash food and clothing was exacerbated by long hot summers,

rudimentary sewage facilities, and make-shift housing. This combination produced unpleasant smells. E. E. Brackins recounted that the oil town of Wink, Texas was completely surrounded by a slow-moving, toxic river made up of sulfur water and other runoff from nearby oil slush pits, “This whole town was surrounded by that sulfur water and it went a way over there into a big lake northwest of town. They had a lake of sulfur water there and it would run over. Then they had a ditch from it clear on down past the west side of Wink here….” Although not stagnant, the sulfur water produced a strong, rotten eggs smell. When asked if this river contaminated the groundwater Brackins responded, “Don’t think that they have ever come up with any proof that it spoilt the water here in town, but I know it’s bound to have done some damage to it especially around the edge of that lake, at the edge of town.”

Overcrowding churned town streets and the region’s limited network of roads into mud pits many feet deep. Descriptions of this mud were ubiquitous in oral histories. API photographers dutifully documented the waist-deep mud and mud-streaked prospectors in West Texas oil towns. William Wolfe narrated, “When it rained [in McCamey] you would think you were at Niagara because the streets – I used to work at the telephone office and when I would go to the telephone office I’d have to wear my brother’s old rubber boots because it was a dirt street and the mud would be up to your knees.” Rainfall was scarce in the Permian Basin and this mud was often made up of a variety of fluids including

25 Brackins also described sulfur gas exposure and described the Hendricks field as having the worst sulfur content. E. E. Brackins, interview, July 16, 1970, Wink, Texas, Oral History Collection, Permian Basin Petroleum Museum, Midland, Texas, 11, 16-17.
slush put runoff, household waste, and animal offal. Surprisingly, however, there are few reports of epidemic disease or gastro-intestinal problems among residents.27

Unless oil companies built them, community centers such as schools, churches, and theaters were slow to develop in the region. To gain positive publicity and encourage oil workers to stay in the area, some oil companies built semi-permanent shotgun houses, community buildings, and entertainment infrastructure for their workers.28 In Iraann, the Ohio Oil Company constructed houses, a school, and drilled several water wells. In Texon the Big Lake Oil Company that owned the town built a grade school, a church, a hospital, a theater, a swimming pool, a golf course, and tennis courts for residents.29 However, some industry employees and local ranchers considered these improvements a wasted effort. Until at least the mid-1930s, many people believed that oil would dry up, the boom would end, and expensive expansion work would be in vain. According to longtime Ector county resident Tom Brandon, local ranchers were particularly skeptical. They, “… weren't interested in building office buildings or anything like that. Most of them thought that the oil would play out as it had in some other Texas communities. They

27 In contrast, gastrointestinal issues from contaminated water were common in Texas’ wetter regions, especially along the Gulf. According to one oil town resident, the “Beaumonts,” a reference to the oil city of Beaumont near Houston, was a known euphemism for diarrhea. James Donohoe remembered living in Batson – near Beaumont – and said that “I lived in the Caledonia boarding house…and the sanitary conditions were terrible. No sewers, nothing. And I have seen in ditches and along the pathways and wherever low places would be water, and that water would lay there until a green scum would come over it. I have often wondered why we all didn’t die of the cholera.” Boatright, Tales from the Derrick Floor, 72.
28 These efforts were heavily publicized by oil companies as examples of benevolent industrial stewardship. William Wolfe and Anna Wolfe, Interview, February 12, 1970, McCamey, Texas, Oral History Collection, Permian Basin Petroleum Museum, Midland, Texas, 17.
wanted to hold on to their money.” Earl Snider described a similar sentiment in Borger, “They thought the town would be here probably a couple of years, three years, four years; get outside and we’ll be gone, we don’t care anything about it.” If people were leaving soon, there was no need to create permanent settlements or to expand existing town infrastructures.

Oral history informants never explicitly discuss their understanding of nature or industry contamination. However, makeshift living conditions, bad food, and undrinkable water compounded the itinerate, lonely nature of oil work itself, probably making many oil workers reluctant to care much about the industry’s impact on the surrounding environment or the long-term consequences of oil depletion. A sense that workers were battling against harsh and dangerous natural forces carved out a connection to the region’s existing cowboy culture. The individualized pursuit of profit helped to restore a sense of worker autonomy and created insular camaraderie in the workplace. Neither lent itself to ecological concern or encouraged long-term investment in oil towns. Oil work was hard, and the conditions were particularly poor in the Permian Basin. Many workers moved in and out of the oil business, alternating between farming in East Texas, ranch labor, and oil work when they could get it. Very few drillers or roughnecks worked for a single company for any length of time and most knew each other by short nicknames.

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31 Boatright, *Tales from the Derrick Floor*, 103.
Because of this general culture of transience, conventional social mores were often ignored in oil towns. Oilfield workers were predominately young, male, and temporarily employed. Public drunkenness, violent crime, petty theft, and prostitution were common. Oral histories and the period press described this “boomer class,” as generally lacking in respectability. E. E. Brackens described oil country drifters, “No I wouldn’t say they were hardened criminals, but they didn’t have much respect for the law...they gambled a lot. A lot of them were pretty decent fellows until they got drunk.” This population was the subject of derision in many oral history interviews. George Bentley of Monahans remembered, “We had a considerable of that type of people – pipe-liners and bootleggers and fast girls back in the old days, in the early part of the boom.” Others recounted more sensational, potentially embellished, stories. W. W. Allman described the murder of Hank Burks, a local bully, in retaliation for a workplace prank, “He didn’t do anything more than just pick the little boy up and spank his hiney for him and he was big enough to do it. Set him down and the little fellow didn’t say anything. Just walked over and got the axe and sunk it right square in his head and walked off and left him.” Others recount robbery at gunpoint while laying telephone lines

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34 Allen W. Hamill, interview by William A. Owens, September 2, 1952, Tulsa, Oklahoma, Oral History of the Texas Oil Industry Collection, Briscoe Center for American History, University of Texas, Austin, Texas.
and outbreaks of venereal disease started by local prostitutes.37

Most towns attempted to enforce order upon “that type of people.” Few towns had the money to hire full-time sheriffs or to build jails.38 With no standing law enforcement, a group of private citizens in Monahans called in the Texas Rangers several times to restore order. In 1927, the Upton County attorney placed a similar request.39 According to William Wolf of McCamey, “There was no jail at first and the first offenders were tied to a post. I never actually saw that but I have a picture of it – the post.”40 Sometimes, however, law enforcement was not welcome. E. E. Brackens described a fight in a restaurant in Desdemona:

There was a Deputy Sheriff and a Texas Ranger there and they were trying to stop a fight that had started in the restaurant and one of them hit one of these fellows in the eye with a gun and knocked his eye out with the butt of the gun. That started a rough house that they couldn’t control. The drillers and tool dressers took these two law men and loaded them in the car and headed off to De Leon with them. About half way to De Leon they kicked them out and told them to keep going, not to come back.41

Such stories demonstrate both a communal desire to punish violent offenders and local

38 Several oil-producing counties in the Permian Basin remained unorganized into the twentieth century, with no standing bureaucracy, or tax collection system, to hire law enforcement. Marjorie Gallion, “Crane County Emerged from Tom Green in ’87,” San Angelo Standard Times, July 4, 1976, San Angelo, Texas, 4H. See also “Discover These West Texas Counties, San Angelo Standard Times, July 4, 1976, San Angelo, Texas, Section H.
solidarity in the face of formalized authority figures.

Such informal policing and local contingency also governed race relations in early oil towns. While good statistics are unavailable, oral histories suggest that the region, like the rest of the American West, was racially and ethnically diverse. However, oral histories taken with the industry’s predominately white workforce, rarely mention the regions black or Tejano populations. When asked if he remembered any “colored men” working as laborers in the oil industry James J. Wheat responds, “No. The only foreigner that I remember out in here was that Wheat No 1. – they had a Chinese cook.” Most oral history evidence of this diversity is couched within discussions of violence. Some describe white-on-black mob violence, lynchings, and home burnings. E. N. Beane recalled a scandal erupting in Crane County after a Filipino cook was murdered after an argument with another cook in 1927. Another described a mob that destroyed a Greek-

42 US Census recordings for race for ethnicity were spotty during the 1920s and 1930s. While the census did include categories for “White,” “Negro,” and “Mexican Origin,” the census records state that such information is “unavailable” for most west Texas counties, including instead only numbers for total population and gender breakdown. US Census Bureau, Census of the Population and Housing 1920, 1930, accessed June 5, 2017, https://www.census.gov/prod/www/decennial.html.
45 Fred Jennings discussed battles between the Ku Klux Klan and the “anti Ku Klux” in the oil town of Goose Creek. James W Kinnear described a race riot and lynching in Sour Lake. Fred Jennings, interview, June 19, 1952, Oil History of the Texas Oil Industry Collection, Briscoe Center for American History, University of Texas, Austin, Texas. James W. Kinnear, interview, July 16, 1953, Beaumont, Texas, Oral History of the Texas Oil Industry Collection, Briscoe Center for American History, University of Texas, Austin, Texas.
46 E. N. Beane, interview, 1970, Crane, Texas, Oral History Collection, Permian Basin Petroleum Museum, Midland, Texas, 17.; In 1976 this unnamed cook was publicly
owned restaurant and clothing store.\footnote{E. E. Brackens, interview, July 16, 1970, Wink, Texas, Permian Basin Petroleum Museum, Midland, Texas, 5.}

Many oil prospectors and oilfield workers traveled to the Permian Basin from farming communities in the South, especially East Texas. These arrivals expanded a de-facto system of racial segregation in the Permian Basin.\footnote{H. B. Brady, “The Race and Texas ‘Black Gold,’” \textit{The Chicago Defender}, September 24, 1938, Chicago, Illinois, 7.} Residential developers and land speculators helped to develop divided residential neighborhoods and separate public spaces for white and non-white residents. William Wolfe remembered very few Latinos living in McCamey during the 1920s or 1930s, “Like all other places, they had their part of town and their school over there.”\footnote{William Wolfe and Anna Wolfe, interview, February 12, 1970, McCamey, Texas, Oral History Collection, Permian Basin Petroleum Museum, Midland, Texas, 30.} Often, nonwhite populations were ghettoized on the outside edges of oil towns. However, these barrios grew quickly. Beginning in the 1930s, many Latinos living in the Rio Grande Valley near the US/Mexico border and in other isolated, West Texas farming communities began migrating to urban areas, looking for oil work. Many headed to Odessa and Midland. These migrants expanded Tejano and Latinx communities outside these cities and near other regional oil towns.\footnote{Arnoldo De Leon, \textit{Tejano West Texas} (College Station: Texas A&M University Press, 2015).}

Waves of deportations and border crackdowns during the 1930s abruptly decreased the already small Tejano population in the Permian Basin.\footnote{Ibid.} However, these unincorporated communities continued to grow. Many Latinxs and Tejanos got jobs as

\footnote{Marjorie Gallion, “Crane County Emerged from Tom Green in '87,” \textit{San Angelo Standard Times}, July 4, 1976, San Angelo, Texas, 4H.}
hired hands or laborers on oil rigs. Although segregation was less rigid on drilling operations – rigs did not maintain separate housing facilities for white or nonwhite populations – Mexican, Tejano, and black workers were relegated to the dirtiest, least prestigious jobs such as digging ditches and slush pits, moving heavy machinery, or cooking camp meals.\textsuperscript{52}

Spatial separation kept non-white populations out of sight and out of mind for most oral history informants. Aside from a few vague references to “Catholics” and a brief description of brawling “Mexican” farmworkers in Grandfalls, most oral history interviews said little about the region’s Latinx and Tejano populations.\textsuperscript{53} This does not mean they were not there. Scholars have documented the large Latinx population in the Rio Grande Valley, approximately 250 miles south of Midland/Odessa. Others have described the large Hispano population just across the state border in New Mexico.\textsuperscript{54} Some oil workers retained fond memories of commercial exchange with entrepreneurial Latinx communities. In the late 1920s, Prohibition provided a crucial opportunity for contact and commerce. Several oral histories referenced “Mexicans” in New Mexico who provided the best and most reliable bootlegged alcohol.\textsuperscript{55}

Accounts of alcohol-fueled lawlessness and bloody murders were good fodder for urban newspapers. Descriptions of oil towns filled with amoral opportunists meshed well

\textsuperscript{52} Olien and Hinton, \textit{Oil Booms}, Chapter 5.
\textsuperscript{55} W. M. Allman and Mrs. Allman, interview, June 19, 1970, Crane, Texas, Oral History Collection, Permian Basin Petroleum Museum, Midland, Texas, 30.
with early-twentieth century critiques of a reckless, unscrupulous, and greedy industry. In oil towns, this sense of danger fed into a culture of gambling and risk-taking that allowed prospectors and workers to accept – and ultimately celebrate – the industry’s many hazards. However, such violence was a source of disappointment for those who wanted to permanently settle in the region. In a 1952 interview, former oilfield worker Max Theodore Schlicher directly linked crime to the region’s lack of stability, “I can't realize right now that anything could have went on as it did in those days [sic]. Everybody was – didn't have no respect for one another and it was just go and come – just a bunch of boomers, what you might say. Here today and gone tomorrow. And, of course, we had a lot of killing, a lot of mystery going on that nobody's ever found anything out about it [sic].”

Oil roughneck cum industry folklorist Moody Boatwright explicitly connected this feeling of temporariness and culture of risk taking to the rule of capture system and the industry’s notorious wastefulness. He argued that drillers extracted oil so quickly that, “neither public agencies nor private capitalists would or could make the investment necessary to provide what we now call a decent standard of living for the temporary population.” Boatwright argued that social disorder and chaos generally correlated with how much of the original population was replaced or subsumed by the new, transient workforce. If the workforce put down roots in the community, the residents’ quality of life would improve. Boatwright’s assessment was echoed by William Wolf who

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56 Max Theodore Schlicher, July 1, 1952, Beaumont, Texas, Oral History of the Texas Oil Industry Records, Briscoe Center for American History, University of Texas, Austin, Texas.
57 Boatright, Tales from the Derrick Floor, 62.
explained, “They never had the right kind of people to build McCamey. Those that wanted to do something never had no say – take for instance me. I donated material to build a bridge between here and Bakersfield; I helped organize 4 of 5 Chambers of Commerce but it was of no avail.” His wife Anne agreed, remarking, “Most people when they came in they thought they would only be here a month or so. If you are going to be that temporary you are not going to put much money in a house…. As a result, sewer and water systems were not built to accommodate the massive influx of new people. Sheriffs were not hired and municipal governments made little effort to enforce oil extraction quotas or proper oil storage techniques.

Like Secretary of the Interior Harold Ickes and other federal policymakers of the 1920s and 1930s, Boatwright believed that industry regulation would make oil production sustainable in the long term and allow for boomtowns to become settled, industrial communities. He was partially correct. By the late 1930s regulation had largely stabilized the Texas oil industry. The need to process a growing Permian Basin crude supply led large oil companies to invest in the construction of refineries and gasoline plants throughout the region. This industry led to needed infrastructure expansion. While not explicitly designed to benefit the general population, refineries required electricity, roads, communication networks, and a steady workforce. Stability slowly improved the living conditions for white workers in Permian Basin oil towns. Dedicated municipal officials developed community services and peacekeeping operations. New industrial facilities and infrastructure networks attracted wealthier people interested in long-term regional

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development.

The construction of better transportation networks was key to this transition. The region’s first two pipelines, built in the 1910s were small, inefficient, and prone to leakage.\(^59\) The region’s two railroads were quickly overwhelmed by oil shipments and the commercial needs of a rapidly growing population. Accusations of monopoly and unfair freight prices dogged both rail companies. As early as 1927, regional newspapers began clamoring for more railroads in West Texas to service the oil industry.\(^60\) In 1929, when no new railroad investors were forthcoming, a small pipeline-building boom began.

While less visually intrusive than oil drilling operations, pipelines had a marked impact on daily life in the Permian Basin. Pipelines diverted cattle pasture, limited agricultural production, and curtailed the movement of human populations. The dangers of a pipeline leak or explosion added yet another hazard to the region’s long list. Pipeline technology had improved steadily over the preceding fifty years, with larger pipelines able to handle higher pressures across longer distances. Construction of these more durable lines was labor intensive. Pipelines were built in sections, with each pipe either welded together or screwed together manually using heavy tongs. Pipelaying was one of the lowest jobs in the oil industry hierarchy. It required few skills and was extremely hard manual labor.\(^61\) Work on West Texas’ “pipeline gangs” was one of the few jobs open to

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the region’s black or Latino residents. These gangs were generally made up of 40 men directed by a “laying boss.” Each worker had a specialized job. “Stabbers” wielded pickaxes to dig ditches. “Tongsmen” handled large sets of tongs to screw pipes together. “Ropemen” helped to hoist pipes into place, assisted by “barmen,” and “jackmen.” Before the 1940s, pipeline gangs dug ditches by hand, laid the pipe, and then covered the line with dirt and gravel. However, the pipe was left uncovered if the cost of digging was deemed “exorbitant” or the surrounding soil was corrosive.

Using these methods, the West Texas pipeline network expanded in both size and complexity throughout 1929. The cover of the April 14, 1929 Abilene Reporter News proclaimed that the Shell Pipe Line Corporation built a ten-inch welded line from McCamey field to Houston. The paper also proudly reported that pipeline transport out of West Texas was expected to reach 350,000 barrels a day within the week. Later that year, the Gulf Oil Company completed an eight-inch screw line from the Hendricks pool before 1950. Pipelaying, Box 20, Coll 711, API Photo and Film Collection, Smithsonian Archives Center, Washington, D.C..

62 However, after the war many of these jobs were slowly phased out in favor of heavy machinery such as tractors and cranes. By the early 1950s, a crew with pipe screwing machines could lay one mile of pipe per day on average. Ultimately, the practice of screwing pipes together was slowly replaced by welding which was both quicker and cheaper. Delivery, Photographs, Box 4, API Photo and Film Collection, Collection 711, Smithsonian Archives Center, Washington, D.C.; See also “National Seamless Pipeline,” National Tube Company Bulletin, No. 23, 1940, Trade Literature Collection, Hagley Museum and Library, Wilmington, Delaware.; “Building the Pipe Line,” 1950, Folder 3 ‘Blasting: Dynamite in Use,’ Series IV, Box 3, DuPont Company Product Information photographs, Audiovisual Collections and Digital Initiatives Department, Hagley Museum and Library, Wilmington, Delaware.

63 George S. Wolbert, American Pipe Lines: Their Industrial Structure, Economic Status and Legal Implications (Norman: University of Oklahoma Press, 1952); “Pipelines-Workers-Tong Gang,” Box 20, API Photo and Film Collection, Col 711, Smithsonian Archives Center, Washington, D.C..

64 “Little Oil is Being Turned into Storage,” Abilene Reporter News, April 14, 1929, Abilene, Texas, 5.
in Winkler County to Monahans, connecting it to a ten-inch welded line to Midland. The line was expected to transport 30,000 barrels daily. Also in 1929 the Texas Pipeline Company completed a line from Winkler County to Jal, New Mexico; the Texas Pipe Line Company finished a ten-inch welded line from Monahans to Iraann in Pecos County; and built a ten inch line from Monahans to the Hendricks pool in Winkler County.\textsuperscript{65} This was in addition to Humble Oil Company constructing two three-inch lines from Kemper Station to San Angelo.

By the 1930s, a standard US oil pipeline was anywhere between four to ten inches in diameter, depending upon its intended use. Every forty miles pumping stations were installed. These contained a diesel engine and tank farms that could hold anywhere between 10,000 to 55,000 barrels of oil. If the terrain was rough or the line was carrying particularly heavy oil, the pumping stations were more frequent.\textsuperscript{66} For example, the 1929 pipeline traversing the relatively flat desert terrain between Winkler County, Texas and Jal, New Mexico required only one 55,000-barrel tank and two 70 horsepower engines that powered two Gould pumps.\textsuperscript{67} Tank farms supplied crude oil directly to the pipeline, allowing the line to maintain pressure – and continue operation – even with a break in the line. Oil companies experimented with new tank liners, roofs, and cooling systems to avoid leakage and reduce evaporation. They built dikes around each tank to prevent the spread of fire. By the early-twentieth century, these tanks were made of steel - instead of

\textsuperscript{65} “Gulf Pipe Line from Hendricks Pool to Monacans is Completed,” \textit{Abilene Reporter News}, April 21, 1929, Abilene, Texas, 5.
\textsuperscript{66} Petroleum Administration for War, \textit{A History of the Petroleum Administration for War}, Engineering and Development, Series 10, Arthur E Pew Jr., Sun Oil Company Collection, Hagley Museum and Library, Wilmington, Delaware.
\textsuperscript{67} Ibid.
the earlier wood - and could hold approximately 5,000 barrels. By the 1930s, the average oil storage tank could hold 100,000 barrels or more. Expansive tank farms became less necessary as the region’s pipeline network expanded and oil could be transported from the well to the refinery more quickly. 68

Even with improvements in oil storage and pipe strength, pipeline leaks were common. Technicians at each pumping station constantly monitored gauges for a loss of pressure, indicating a break in the line. An army of “line walkers” patrolled the length of pipelines on foot, searching for leaks. 69

Line breaks sometimes made themselves known in very dramatic fashion. William Wolfe remembered, “I got a contract, my job was to lay the pipe on top and some fellow got the contract to cover the ditch back…So one day a feller come in and he says: Wolf, lets go down to the lease…He said the cattle drank oil and they can’t multiply – they can’t have no calves [sic].” Wolf called a local veterinarian which instigated a lengthy debate between himself, other oil contractors, and ranch hands. They carefully weighed the estimated total profit lost from the cattle being unable to reproduce verses the cost of the lost oil.

69 Initially this was done by walking or driving the length of the pipeline, later via single-engine flyover. Wolbert, American Pipe Lines.
Wolf continued, “So we went out there and this fellow Allen, he was the McElroy Ranch foreman, the head of the ranch. ‘Now which one of the cows do you want me to kill to see how much oil is inside?’ He said, ‘Don’t kill, don’t kill them cows.’”\(^{70}\) Wolfe explained that, in the end, the cows were not slaughtered for the oil in their stomachs. The landholders were offered monetary compensation for the cows’ bad health and the lost oil profits were not recovered.

Pipelines were built along geographically accessible "rights of way" determined by industry engineers and enforced with eminent domain. Engineers tracked a route, “as short and as direct as possible” irrespective of property lines, local geography, or human and nonhuman habitation. In a region with few landmarks, property lines were used as landmarks for pipeliners as they attempted to navigate in the flat, treeless terrain.\(^{71}\) However, identifying pre-existing property lines was a challenge. Drilling maps and surveying logs from the Magnolia Oil Co. in the 1920s and 1930s reveal that before attempting to lay a pipeline, oil surveyors’ spent considerable time assessing the often ambiguous location of rural Permian Basin property boundaries.\(^{72}\)

The correspondence of Permian Basin drilling contractor C. J. “Red” Davidson illustrated some of the challenges surveyors faced as they constructed the industry’s infrastructure. In an August 1935 letter from R. T. Bucy to Red Davidson, Bucy described the problems he faced trying to establish property lines in Yoakum County:


\(^{71}\) Survey Book, Folder ‘Exploration and Producing 1935 Survey Book,’ Box 2.207/E220, EXXON Mobil Historical Collection, Briscoe Center for American History, University of Texas, Austin, Texas.

\(^{72}\) Drilling Logs, Box 2.207/E220, EXXON Mobil Historical Collection, Briscoe Center for American History, University of Texas, Austin, Texas.
We went to Yoakum County Tuesday morning. Mr. Tom Tripp went with us from Odessa. We went on to Plains in order to search the records for specific data as to the marks on the ground delineating the surveys in this area. It then developed that in history of Yoakum County the Court House has burned to the ground destroying all records twice prior to this time. Therefore there are no records of any consequence of the early surveys in this county.

Bucy went on to blame his delayed return on unpredictable weather, “…then we went out to the Bennett Ranch and the worst sand storm of all times was in progress which caused us to have to remain over in Plains Tuesday night…Those two days were the worst sand and blow storms that I have ever seen and it were the was almost impossible to do anything.” The exasperation underlying this exchange implies that such difficulties were not uncommon.

Once the land was surveyed, the permits secured, and the pipe was laid, pipelines helped to integrate the Permian Basin into a growing oil-industrial network that crisscrossed North America. Pipelines dramatically increased the amount of oil extracted in Texas. All new pipelines in the Permian Basin were “feeder lines” that connected the region to the network of larger “trunk lines” that stretched between national refining centers along the Gulf and on the East Coast. New lines connected the Permian Basin with tanker ships in Houston, gas producers in New Mexico, as well as East Coast

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73 Letter from R. T. Bucy to R. J. Davidson, Midland, Texas, April 12, 1935, Folder ‘Ruth Bennet #1 Correspondence Yoakum County TX 83-021 C J Red Davidson,’ Box 3, C. J. Red Davidson Collection, Permian Basin Petroleum Museum, Midland, Texas.

74 These feeder lines were commonly eight inches in diameter and buried several feet below ground. During this period, a four-inch pipeline operated best with about 800 pounds of pressure per inch. In the 1940s this would move approximately 3800 barrels of crude per day. Many gathering lines, which gathered all the oil in a producing district into a combined pool ready for sale or transport along a trunk line, were also built in the region. George Wolbert, *American Pipelines*. 
refinery networks.\(^{75}\) At optimal capacity, a six-inch line could deliver around 10,000 barrels per day and an eight-inch would deliver 21,000 barrels per day. One late-1920s article estimated that pipelines transported the majority of West Texas oil. On March 30, 1929, average production was 363,187 barrels, of which only 8,291 barrels were stored. Pipelines transported the majority of this oil – 238,242 barrels – from West Texas to either East Coast refineries or to ports where it was shipped abroad via tanker ship.\(^{76}\) By 1935, the US pipeline system stretched 250,000 miles, 112,000 miles of which supplied crude oil for gathering and transport, 3,500 miles transported refined gasoline, and 150,000 moved natural gas.\(^{77}\)

This network spurred further construction, however early efforts met with challenges. A reliable pipeline network prompted large oil companies to establish oil refineries and gasoline plants in the region. In the 1920s and 1930s, it was usually cheaper to refine oil and its byproducts closer to the source instead of shipping crude to distant cities for processing. However, it was also expensive to transport the iron, steel, and wood needed to build refineries in the Permian Basin. For much of the 1920s and 1930s, the costs did not outweigh the benefits. Even after oil production rebounded after 1935, correspondence between oil driller Red Davidson and his employees in the Permian Basin revealed that in 1936 and 1937 they were forced to shut down several wells after oil discovery because oil storage facilities and transport systems were not

\(^{75}\) Telegrams from J. Howard Pew to J. Edgar Pew, June 1941, Folder ‘892.116 DIS.1 War Emergency Pipeline 1941-1945, A. E. Pew Jr.,’ Collection 10, Box 97, Sun Oil Company Collection, Hagley Museum and Library, Wilmington, Delaware.

\(^{76}\) 31,512 barrels were shipped via tank car and 45,423 went to West Texas refineries.

available to transport the oil to buyers.\textsuperscript{78}

During the late 1920s, a few small refineries sprang up in West Texas to service specific oil fields. However, refinery expansion was slow going. In 1927, the Humble Oil Company opened one of West Texas’ earliest refineries in McCamey. However, the refinery shut down in 1932. Oral history accounts differ as to exactly why.\textsuperscript{79} Some said the refinery burned down. Some said it was destroyed in a catastrophic explosion. Others believed it was a casualty of the Depression’s low oil prices. Yet others argued the cost of shipping gasoline to Gulf markets was just too high.\textsuperscript{80}

The region’s first refineries were small “tea kettle” refineries, very similar in shape and design to the stills used during the Depression to make bootlegged whisky.

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{refinery.png}
\caption{West Texas refinery}
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Into the early 1930s, “straight run” distillation was the most common refining process at these small West Texas refineries. Originating in the nineteenth century, straight run distillation is the simplest and oldest method of gasoline production.

\textsuperscript{78} Telegram, Folder ‘Ruth Bennet #1 Correspondence Yoakum County TX 83-021 C. J. Red Davidson,’ C. J. Red Davidson Collection, Permian Basin Petroleum Museum, Midland, Texas.

\textsuperscript{79} George Ramer, interview, February 12, 1970, McCamey, Texas, Oral History Collection, Permian Basin Petroleum Museum, Midland, Texas, 10.

production. Straight run distillation simply required a series of large metal containers and
the fuel to boil crude oil hot enough to extract vaporized gasoline.\textsuperscript{81}

This process remained similar as Texas’ refineries expanded during the 1930s boom. Pipelines moved crude oil from a tank farm into the primary distillation unit - a
series of pipes set within a tall, cylindrical fractionation tower. Crude oil was heated to
approximately 600 degrees Fahrenheit, often using residual gas from previous refining
runs. The different chemical components in crude oil boiled at different temperatures.
Gasoline, the lightest hydrocarbon, quickly transformed from a liquid to a gas and rose to
the top of the tower. It was then removed, processed for impurities, and blended with
other chemical fractions for consumer use. Similar processes produced fuel oil, kerosene,
and other chemicals.\textsuperscript{82}

After 1935, oil companies invested in refinery construction across Texas. By the
day of the 1930s, gasoline and jet fuel shortages in Europe helped to drive up demand for
renewed US drilling activity. Refining operations quickly expanded across the state.
According to the US Bureau of Mines, in 1933 Texas refineries processed only 54.2
percent of Texas crude oil. By 1941 this number had increased to 85.9 percent. During
this same period, the total amount of refined petroleum products produced in Texas

\textsuperscript{81} William A. Owens, “First Teakettle in Texas,” DuPont Chemical Division, Briscoe
Center for American History, University of Texas, Austin, Texas.
\textsuperscript{82} Magnolia Petroleum Company Refining Division, “Fundamentals of Refining,” 1953,
Folder ‘Exploration and Producing,’ Box 2.207/E221, EXXON Mobil Historical
Collection, Briscoe Center for American History, University of Texas, Austin, Texas.;
Socony-Vacuum, Folder ‘General Petroleum Corporation Histories 1932-1958,’ General
Petroleum, Folder ‘General Petroleum Corporation News Clippings, 1955-1990,’ Box
2.207/E214, EXXON Mobil Historical Collection, Briscoe Center for American History,
University of Texas, Austin, Texas.; \textit{Ref - Workers –p Removing Petrol. Coke from
Cracking Still}, 1930, Box 23, Col 711, API Photo and Film Collection, Smithsonian
Archives Center, Washington. D.C.
New refining techniques facilitated this growth and were especially lucrative for the Permian Basin. In particular, a new process called thermal cracking made the lower quality crude found in much of the Permian Basin more valuable.

After the early 1930s, straight run distillation was slowly phased out in favor of the more complex thermal cracking process. Thermal cracking refers to a secondary process completed after straight run distillation which allows a higher percentage of gasoline and other materials to be extracted from crude oil. As refineries expanded crude oil was sorted in tank farms according to gasoline content and different grades were added together in the fractionation tower to produce the optimal mixture. After the first, straight run distillation, to complete thermal cracking, oil distillates were heated multiple times. These heating runs would reach 1,000 degrees Fahrenheit or more. As more and more chemicals separated during each successive run, they passed through a series of towers to further breakdown more of the hydrocarbons, producing more gasoline and other chemicals.\(^\text{84}\)

The growth of increasingly large refineries, tank farms, and oil pipelines had a ripple effect across Permian Basin oil communities, bringing wealth, prestige, and stable jobs. Refineries required reliable infrastructure and oil companies were willing to spend heavily to insure the success of their investment. Oil companies constructed sewage systems and communication networks. They tapped potable groundwater sources, paved

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\(^\text{83}\) In 1933, Texas refineries processed 218,145,000 barrels of crude petroleum and natural gas. By 1941 this had increased to 436,000,000 barrels. “Important Facts about Texas Oil,” 5, January, 1943, Texas Mid-Continent Oil and Gas Association, Warshaw Petroleum Collection, Smithsonian Archives Center, Washington. D.C., 12.

\(^\text{84}\) “Masters of Molecules: The Story of Petroleum Refining,” The Texas Company, 1944, Box 6, Warshaw Center Petroleum Collection, Smithsonian Archives Center, Washington, D.C., 9-12.
roads, and built worker housing. They also had an important impact on regional electrification. Refinery operations ran 24 hours a day. Electricity was required to run drills and pump jacks and to light drilling platforms as work continued well into the night. \(^{85}\) Pipeline companies hired an army of technicians to install diesel generators and electrical lines at intervals along oil pipelines. In 1926, David Henry Levy was contracted away from the Texas Power and Light Company by Magnolia Oil to run electric lines to the Panhandle to power pump stations along newly installed pipelines. Levy later joined five engineers in what would become Magnolia’s first electrical engineering division. By the 1950s, sixty percent of Magnolia pipelines would run on electric power. \(^{86}\)

Reliable water was both crucial to the expansion of refinery operations and very hard to come by in the Permian Basin. Oil drilling and processing used millions of gallons of water to create drilling mud, move waste material, act as fire prevention, and dilute chemicals during the thermal cracking process. Oilfields in Oklahoma and East Texas relied on river water, stored in massive tank farms, to supply the industry. However, there was little running water in the arid Permian Basin. \(^{87}\) Further, most of the Permian Basin’s shallow groundwater was alkaline, high in minerals, and often

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\(^{85}\) “Electric Service for Oil and Gasoline Pipe Line Pumping: A Report of the General Power Committee Commercial National Section,” National Electric Light Association, 1932, Special Collections, Hagley Museum and Library, Wilmington, Delaware.; On April 29, 1938 the *Abilene Reporter News* announced that “Oil Showing in Stonewall Test” and discussed that the electrical power lines leading to the well were struck by lightning so the electric drilling rigs couldn’t be used for a couple days. “Oil Showing in Stonewall Test,” *Abilene Reporter News*, Abilene Texas, April 29, 1938.

\(^{86}\) “Men Who Make Magnolia,” *Magnolia News*, 12-14, Box 2.207 E224, EXXON Mobil Historical Collection, Briscoe Center for American History, University of Texas, Austin, Texas.

\(^{87}\) “A Trip to the Oklahoma City Oil Field,” September 8, 1929, Oklahoma City Chamber of Commerce, Box 6, Collection 60, Warshaw Petroleum Collection, Smithsonian Archives Center, Washington, D.C..
contaminated with crude oil. This combination made the region’s water notoriously unsafe for drinking and unusable for drilling. According to James J. Wheat of Loving County, Texas, the groundwater damaged boilers and drilling rigs alike, “Car engines, radiators; anything you used it in will give you trouble. You can boil it in the damn teakettle and it will stop it up. You boil some in a pan and you will get ¼ inch of white corrosion and scale.”

New water pipeline systems were required to pump potable water to drilling locations, new oil towns, and to the growing network of refineries.

In what would become a common regional irony, the same drilling techniques that contaminated the region’s groundwater with sulfur and salt brine were used to expand urban well systems. The same pipelayers who built oil pipelines were also contracted to lay water lines from oil camps and boomtowns to municipal water systems. Oral histories and the local press remarked upon the novelty of acquiring running water as a fundamental mark of progress and sense of community permanence.

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The creation of these networks coincided with other infrastructure improvements that enhanced the quality of life for both those that worked on oil rigs and workers in the region’s new refineries. Towns and oil camps adjacent to pipelines received electrification at a rate much faster than the rest of rural America. By the 1920s about half of urban homes in the US had electricity.  

In Texas, however, electrification varied sharply by region. In 1940 only thirty to forty percent of homes had electricity. By contrast, isolated and sparsely populated West Texas counties had on average the highest rate of electrification in the state. Dee Locklin of McCamey remembered that while he was forced to build his own shack on an eighteen-month drilling operation in Reagan

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County, the oil company constructed a power station and provided workers with household electricity for a small fee.\textsuperscript{94} Similarly, pipelines and oil refineries were often equipped with the region’s earliest telephone lines. Communities adjacent to these operations also received phone service.\textsuperscript{95}

City and town governments used the flow of capital from the oil industry to build sewer systems and pave roads.\textsuperscript{96} Between 1922 and 1942 the total amount of state revenue generated from pipeline regulatory taxes alone increased from $81,638 to $912,000.\textsuperscript{97} This vastly increased state funding for infrastructure improvements. Similarly, in most West Texas counties, oil taxes made up the majority of the municipal budget. For example, in 1942 taxes on oil production made up 86 percent of Ector County revenue, 82 percent of Ward County, and 84 percent of Winkler County.\textsuperscript{98} This money went a long way and over time tent cities and work camps were transformed into small towns with permanent houses and thriving retail trades. Storekeepers, bankers, and grocers arrived to conduct business with a newly cash-flush population that needed food,

\textsuperscript{94} Dee Locklin, interview, February 13, 1970, McCamey, Texas, Oral History Collection, Permian Basin Petroleum Museum, Midland, Texas, 9.; Clell Reed and Bill D. Ingram had similar memories. Hinton, “Creating Company Culture,” 379, 381.
\textsuperscript{95} “Humble Payroll From Office Here Around $40,000,” \textit{The Odessa American}, October 11, 1939, Odessa, Texas, 1.; Telephone service in urban centers also expanded with the oil industry, C. L. Alderman, “Alderman Says Phone Service to be Better,” \textit{The Odessa News and the Ector County News}, November 8, 1927, Odessa, Texas, 1.
\textsuperscript{96} “McCamey Plans for Permanence Following Late Election Victory,” \textit{The Odessa American}, May 15, 1931, Odessa, Texas, 6.
\textsuperscript{97} “Texas Gross Production Tax Collections,” \textit{Important Facts about Texas Oil}, 5, January 1943, Texas Mid-Continent Oil and Gas Association, 18, Warshaw Petroleum Collection, Smithsonian Archives Center, Washington, D.C..
\textsuperscript{98} “Extent to Which Texas Petroleum Supports Local Government,” \textit{Important Facts about Texas Oil}, Ed 5, January, 1943, 16-17, Texas Mid-Continent Oil and Gas Association, Warshaw Petroleum Collection, Smithsonian Archives Center, Washington, D.C.
supplies, and entertainment. In turn, these new arrivals brought economic diversity to the region as secondary industries such as restaurants, boarding houses, movie theaters, and taverns were built to accommodate the new labor force. Mrs. Anna Wolfe described this process succinctly, “…when people once decided there were going to be here longer the began to build better houses.” \(^{99}\) In Texon, during the 1930s the semi-professional baseball team the Texon Oilers was established along with a drug store, café, boarding house, tailor-ship, grocery stores, barber shops, beauty parlors, car service station, dairy, ice house, and bowling alley. \(^{100}\)

Beginning in 1929, oil employees founded a variety of civic organizations, especially churches. Signaling growing middle class pretentions, in oral histories locals connected these to a sense of personal respectability and the region’s growing stability. For example, W. E. Bill Reneau described his arrival in Kermit, Texas near the New Mexico border, in 1933 and his quick emersion in local associational life. Reneau was a member of the local Masonic Lodge, Lions Club, the Baptist Church, and became president of the Winkler County School Board. Similarly, W. W. Allman, who arrived in Crane, Texas in 1929, remembered that, “We had community interests to fill up our vacant time when we weren’t working – church, Scouting, and PTA. I’ve been registered with the Concho Valley [Boy Scout] Council for 37 years straight.” \(^{101}\) Allman


\(^{100}\) Martin W. Schwettmann, “The Discovery and Early Development of the Big Lake Oil Field” (M.A. thesis, University of Texas, 1941).

remembered that the Boy Scouts were started in Concho Valley in 1932. In this way, while oil drilling still made up a majority of the total regional workforce, the economy slowly diversified and community structures became more permanent.

The ability to quickly set up a complicated industrial system in previously uninhabited and harsh ecosystems was a point of pride for twentieth-century oil industry employees and often remarked upon in the local press. As opposed to agriculture or ranching, which, even with irrigation technology, was restricted to relatively temperate climates, oil deposits bore little geographic correlation to human habitability. Oil has no growing season. It can be harvested irrespective of time of day or fluctuation in temperature. It is not susceptible to disease. The only limitation is the sophistication and durability of the technologies used for extraction and transport. In West Texas, people followed oil wherever it led them, altering increasingly inhospitable landscapes to allow for their survival. Wells were dug in previously uninhabitable desert, with speculators building company towns and work camps that were wholly dependent on supply lines for water and other basic supplies. Later, oil pipelines linked these communities to centers of commerce and communities became relatively self-sustaining.

For some Permian Basin oil workers, oil’s slow technological development was directly linked to better regional quality of life. These locals saw infrastructure as key to a civilization-building project. Like pipeline and refinery construction, road-building projects produced regional excitement with many describing a growing sense of industry

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permanence. In 1929, the *El Paso Evening Post* ran a half-page montage depicting
regional landscapes dramatically altered by oil. Under a photo of the oil-clogged Pecos
River, the caption rejoiced, “Pecos river flowing oil.” Further down the page, a lengthy
article boasted:

The empire that is West Texas has enthroned a new king in the last six years, a
monarch that has wrought a greater transition than any other factor and only now
has begun to realize the full sweep of his power…. Derricks have become more
conspicuous in the landscape than windmills, old overland trails have become
improved highways and ranch roads, once seldom used, are filled with oil field
traffic.\(^{104}\)

In such publications, oil was demonstrative of humanity’s ability to conquer nature. Oil
infrastructure was a fundamental improvement on the region's primitive past, erasing the
region’s lack of distinctive geographic features and natural beauty with rapidly expanding
oil communities. Construction was a stepping-stone into the modern world and national
freedom of movement, epitomized by the automobile, was fueled by Permian Basin
hydrocarbons.\(^{105}\)

According to this narrative, oil infrastructure improved upon nature and allowed
human industry to flourish where it once could not. New technologies were framed in
contrast to the region’s earlier reputation as speculative, haphazard, unorganized, and
lawless. In contrast to unregulated chaos, oil’s technological systems brought fresh water
and unlimited light and power miles out into the previously uninhabitable desert. Oil
pipelines, while not new technologies by 1930, were mechanized, increased connectivity,

Paso, Texas, 1C.; Folder ‘San Angelo Standard Times,’ Box 83-021 4 of 4, C. J. Red
Davidson Collection, Permian Basin Petroleum Museum, Midland, Texas.; Rister, *Oil!
Titan of the Southwest*.; Myres, *The Permian Basin*.

\(^{105}\) AP, “Natural Gas Industry to be Expanded, *Abilene Reporter-News*, May 18, 1930,
Abilene, Texas, 7.
and brought jobs, profit, and tax revenue to the region.

For others, however, this new infrastructure again produced monopoly and only fueled a tradition of exploitative greed. Because of their extreme importance to oil-producing communities and significant impact on both property rights and local geography, oil pipeline regulation was a source of constant friction between landowners, oil companies, and local and state regulators.\(^{106}\) Pipeline companies made money in different ways. Oil producers either paid a contract rate to pipeline companies for their transport services or sold crude oil directly to pipeline companies. Sometimes, pipeline companies acted as middlemen between producers and processors. More often, the pipeline company was established as a subsidiary of a larger oil processing company. As the industry became more sophisticated, oil purchasing companies—middlemen who bought crude oil from a producer and sold it to refineries based on fluctuations in market prices—became common.\(^{107}\)

In Texas, just as with oil drilling, fear of monopoly dominated the regulatory response to pipeline development. The state legislature claimed that increased regulation of oil industry transport networks—either to reduce physical and economic waste or to


\(^{107}\) George Wolbert explains the economic logic behind this network, “The shipper who sends his own product to market or to his own refinery by rail must construct his own gathering system, installs storage tanks, and bear the cost of a loading rack. The pipeline, eliminating complicated operations, has the inherent advantages of specialized, faster, safer, and cheaper transportation.” These oil purchasers, pipeline companies, and oil refineries all constructed and maintained their own tank farms at strategic points between oil fields and refineries. Wolbert, *American Pipelines*. See also Christopher Casteneda and Clarence M. Smith, *Gas Pipelines and the Emergence of America’s Regulatory State: A History of Panhandle Eastern Corporation, 1928-1993* (Cambridge: Cambridge University Press, 1996).
stabilize oil prices – provided an opportunity for the major oil companies to strong-arm regulatory agencies and foster monopoly.\(^\text{108}\) As a result, the legislature was ever-reluctant to regulate the industry. This did not keep other organizations from trying. Beginning in 1917, the Texas Railroad Commission was given the power to regulate pipelines as part of their effort to stabilize the national oil supply. Because most pipelines crossed state lines, they were subject to regulation by the US Interstate Commerce Commission. Under the doctrine of correlative rights, in which oil producers were deemed entitled to access to common resources, interstate oil pipelines were ruled “common carriers” and pipeline companies could not refuse to service companies willing to pay for their services.\(^\text{109}\) However, accusations of corruption and the oil glut of the early 1930s demonstrated that these laws were often ineffective.\(^\text{110}\) At the local level, debates continued in the late 1930s over the increasing level of large oil company control over regional business. Permian Basin landowners had mixed reactions to both oil companies’ claims of benevolence and to pipeline regulators.\(^\text{111}\) Small producers continued to argue that large oil companies were given preferential prices.


\(^{109}\) Beginning in the 1880s, a variety of cases invoked the idea of correlative rights to prevent oilfield waste and anything that impaired the rights of an oil producer to access markets, this included oil pipelines. These cases became the basis of oil and gas law in states throughout the US. Correlative rights were officially upheld in Texas in Elliff v. Texxon Drilling Co. Mabel and Frank Elliff were awarded damages to their potential profit from oil extraction after an oil well neighboring their property blew out, allowing oil in the commonly shared pool to evaporate. Elliff v. Texxon Drilling Co., 146 Tex. 575 (Tex. 1948).


Pipelines designated as common carriers at times used eminent domain law to gain access to private property. This brought a variety of hazards including tank leaks, animal death due to emersion in oil, and fires due to lightning strike or spontaneous combustion onto private land without the permission of the landholder. Clyde Barton, of Kermit, Texas, described the size and geographic scope of these pipeline and tank farm networks:

But they had enormous tank farms all over this county [Winkler]. There are a few of them left and signs of a lot of them. There must have been 15 or 20 of those big tanks in the heart of the field; they built them between these wells. …They had a big farm down at Wickett and they would run those pipelines. It was a busy outfit for a while. They did all that drilling, 600 some wells, from the early part of ’27 up to the last quarter of ’29.

However, infringement on private property rights were not the biggest concerns aired by regional politicians.

In the Permian Basin, regional press fixated on the issue of monopoly and described unregulated pipeline construction as a way to circumvent big company control. They promoted the expansion of the oil pipeline network as a way to bypass both railroad and oil processing monopolies, democratizing pipeline transport for small oil companies. Throughout the 1930s, the Humble Pipeline Company held monthly safety meetings in

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113 When they did occur, such sensational disasters were publicized heavily in the Texas press. For example, “Millions of Barrels of Oil on Fire at Humble,” Austin Statesman, July 24, 1905, Austin, Texas.; Oil Scrapbooks Collection, Briscoe Center for American History, University of Texas, Austin, Texas.


115 This is not to say that regional landowners never disputed pipeline routes. In 1934 Elliot Cowden won a monetary compensation for property damage due from the Humble Pipe Line Company. “Cowden Awarded $15.00 An Acre By Jury Here,” The Odessa American, April 6, 1934, Odessa, Texas, 1.
the Ector County courthouse, hoping to alleviate local concern over pipeline expansion. Humble agued that pipelines as safer than rail transport and that pipelines helped to reduce waste from leakage or evaporation. This perspective was backed by mid-century industry historian George Wolbert, along with many policy makers in the Permian Basin. However, this booster rhetoric sidestepped a crucial point. In reality, Permian Basin producers were uniquely dependent upon oil pipelines. If Permian Basin oil was too far away from existing tank farms or transport networks, few purchasers bought the oil. Further, pipelines were the only technology available that could transport natural gas to refineries. Natural gas was incredibly common in the Permian Basin and, while in the 1930s only had limited uses, it was becoming increasingly lucrative to oil producers. Better pipeline networks allowed producers to sell this otherwise wasted byproduct.

Some local newspapers, and many oil companies, used a different tactic to oppose pipeline regulation. They defended new pipeline networks, and the oil industry more generally, as central to Permian Basin community development. On June 21, 1936 the Abilene Reporter News described a Winkler country rig builders strike, contrasting a description of discontented workers with discussion of just how much money the oil industry put back into the local economy. The author reminded readers that oil money was not leaving the state but was reinvested in infrastructure for local landholders. In 1937, the Mid Continent Oil and Gas Association (MCOGA) published a series of

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116 “Humble Safety Campaign Gets Results in ’39,” The Odessa American, January 3, 1940, Odessa, Texas, 1. Before pipelines, railroads were the most common mode of oil transport. More than 10,000,000 tons of crude had been transported by railroad by the 1930s. Tank cars were invented in the nineteenth century to remove the need for barreling oil. By the 1930s, in most of the country, tank cars were used most often for shipping finished products. George Wolbert, American Pipelines.
bulletins arguing that oil taxes made up the majority of public school budgets. According to the MCOGA, the oil industry paid a yearly total of $17,360,888 to school funds. In, “oil districts the scheduled tax income per pupil ranged from $102.21 to $378.98 of which oil was the source of from $60.30 to $245.48 per pupil.” In sum, “oil not only pays a large share of local school taxes in any counties of the state, but also is the direct source of 32 per cent of all money apportioned to all common and independent school districts of the state.”¹¹⁷ In 1938, the MCOGA assessment was backed up in the Abilene Reporter News, which described in great detail just how much money oil industry tax revenue contributed to the school system with the headline, “Industry Paying Nearly $12 For Each State Pupil.”¹¹⁸

Such assessments did not resolve the issue. Oil leaseholders and small oil companies perceived themselves to be under threat by large multinationals due to unfair oil transport rates. In 1938, the West Texas Chamber of Commerce - a trade organization purporting to represent the interests of most communities in West Texas and the Texas Panhandle - made it a convention priority to secure lower freight rates for, “producers, businesses, and consumers.”¹¹⁹ This represented a coalition between the region’s agricultural producers and oil producers. In 1939, the debate again heated up as representatives of the West Texas Chamber of Commerce publicly derided what they

¹¹⁷ Mid Continent Oil and Gas Association, 1937, Texas Mid Continent Oil and Gas Association Records, Briscoe Center for American History, University of Texas, Austin, Texas.
considered to be discriminatory rates for different sections of the country.\textsuperscript{120}

At the national level, legislative opposition to the control of oil pipelines by the majors had been ongoing since the early days of the Depression.\textsuperscript{121} Between 1931 and 1950 congressional bills to divorce pipelines from refineries and oil producing companies were faithfully introduced every year, with a single break during the 1948-1949 Congress.\textsuperscript{122} Lengthy hearings before the Temporary National Economic Committee, ongoing from 1939 to 1941, ultimately suggested the divestment of oil pipelines from all Major oil producers and refiners. This proposition was helped along by the fact that during the Hearings, William S. Farish, President of Standard Oil of New Jersey, publicly admitted that the Majors owned or controlled 57.4 percent of crude oil gathering line mileage, 89 percent of crude trunk mileage, and a full 96.1 percent of all gasoline line mileage in the United States.\textsuperscript{123}

While these debates raged on throughout the 1930s, only to be put aside by the

\textsuperscript{120} “WTCC Fires Guns in Freight Rates Battle,” \textit{Abilene Reporter News}, May 15, 1939, Abilene, Texas, 1.
\textsuperscript{121} “Major” is a term first coined by industry members to differentiate between the array of Standard Oil subsidiaries and all other oil companies – known collectively as the “independents.” The name stuck and was later used to differentiate between oil companies with assets of at least $25 million and smaller companies. \textit{Hearing before Temporary National Economic Committee, pursuant to Pub Res 113, 5\textsuperscript{th} Cong., 76\textsuperscript{th} Cong, 2d & 3d Sess, Parts 14-17A 7376, 7588, 7652. 1939-1941, Trade Literature Collection, Hagley Museum and Library, Wilmington, Delaware.}; George S. Wolbert, \textit{American Pipe Lines}, 3.
\textsuperscript{122} In 1940, such statements spurred the Justice Department to formally announce its intention to use antitrust laws to divest all pipelines from Major oil companies. Although divestiture was postponed due to the outset of war, congressional opposition to pipeline monopolies continued. U.S. Congress, Temporary National Economic Committee, TNEC Hearings, 7103-7104, Records of the Temporary National Economic Committee, U.S. National Archives, Washington, D.C..
\textsuperscript{123} U.S. Congress, Temporary National Economic Committee, TNEC Hearings, 7103-7104, 1938-1941, Records of the Temporary National Economic Committee, U.S. National Archives, Washington, D.C.\textsuperscript{123}
US entrance into World War II, the exponential growth of the region’s two main urban centers, Odessa and Midland, was a significant factor in the Permian Basin’s support for unregulated expansion. The two cities had grown quickly in the 1920s. They bounced back quickly from the ravages of the Depression, once again experiencing growth in the late 1930s. By 1938 both Odessa and Midland took on the trappings of established Southern cities, with early track housing, shopping districts, cultural amenities, and racial segregation policies.\textsuperscript{124}

In the late 1920s’s, as oil production increased, pipelines transported more oil and new refineries hired more workers. More management personnel arrived in the Permian Basin to oversee production. Odessa, Midland, and San Angelo quickly became bases of operations for oil investors from Fort Worth, Dallas, and the East Coast. In 1925, Odessa’s population was only 750. By 1929, the city’s population jumped to over 5,000.\textsuperscript{125} Oil companies invested in the construction of new hotels and office buildings in Midland and Odessa. However, that same year, Odessa experienced its first housing crisis. City officials responded by building a municipal water system, electrical grid, an improved telephone system, and five blocks of brick buildings in the downtown. State

and county officials began massive road construction projects, including US Highway 80 which connected Odessa and Midland to urban centers in the Dallas area.\textsuperscript{126}

During the 1930s, Odessa became a center for oil tool manufacturing and supply while San Angelo, located farther away from both new oil pipelines and the region’s new network of roads, declined. As Odessa developed an identity for regional heavy industry, Midland became the area’s administrative capital. By 1930, Midland had become an important pipeline terminal at a place of convergence for pipelines coming in from isolated western fields. This trend began in the in the early 1930s, as overproduction in the East Texas field reduced exploratory drilling in West Texas. “Check meets,” or meeting for oil scouts to share samples and information, were consolidated and moved to centralized and easily accessible Midland from such diverse towns as Pecos and San Angelo.\textsuperscript{127}

Although both cities fared better than some, the dual hits of national depression and catastrophic drop in oil prices slowed nascent community development projects and economic diversification efforts in Midland and Odessa. Newly-built office buildings and hotels stood empty. In an interview with industry historians Roger and Diana Olien, one driller remembered that, “The oilmen who remained in [Midland], both independents and major company personnel, met for morning coffee in the Hogan Building’s drug store…they would occasionally pass around a flask of bootleg whiskey, drinking to toast those who had work and to commiserate with those who lost it.”\textsuperscript{128} Despite these

\begin{footnotes}
\item[127] Olien and Hinton, \textit{Wildcatters}, Chapter 4.
\item[128] Olien and Hinton, \textit{Wildcatters}, 68.
\end{footnotes}
troubles, according to the 1940 US Census, Ector and Midland Counties maintained some of the lowest unemployment rates in the state during the Depression years, even though most of the region lists almost no wages paid from manufacturing operations during this period.\textsuperscript{129} Although not fully effective, regulations put in place by the Texas Railroad Commission and federal authorities stabilized oil production. Beginning in 1934, industry in the region began to bounce back. As new discoveries led the region into a second boom in 1935, infrastructure building picked up once again.

Although in 1937, only eighteen of forty-two petroleum related firms listed in the 1930 Midland City Directory were still in business, in the long run, industry consolidation during the worst of the Depression would prove to be a boon to industrialists in Odessa and Midland.\textsuperscript{130} As the second boom began in 1935, Odessa and Midland experienced significant growth. The population of Odessa quadrupled in size between 1930 and 1940.\textsuperscript{131} In 1934, several new oil tools manufacturers opened in Odessa. That same year an oil scout company moved to a new headquarters in Midland.\textsuperscript{132} This process sped up dramatically by the end of the decade. According to the 1938-1939 Odessa City Directory, Odessa held 57 oil well supply companies, 10

\textsuperscript{129} Percentages derived from US Census Bureau, \textquotedblleft Total Population, 1940,\textquotedblright; \textquotedblleft Employed Male Laborers, Except Farm,\textquotedblright; \textquotedblleft Totally Unemployed Persons Registered, 1937,\textquotedblright; \textquotedblleft Wages Paid in Manufacturing, 1937,\textquotedblright; Census of the Population and Housing 1940, accessed June 5, 2017, https://www.census.gov/prod/www/decennial.html.


\textsuperscript{132} for example, a drag bit plant opened that year. \textquotedblleft Odessa Plant to Make Drag Bits\textquotedblright; and \textquotedblleft Oil Scout Group Moves to Larger Midland Quarters,\textquotedblright; \textit{Abilene Reporter News,} Abilene Texas, December 9, 1934, 10.
servicing companies, 10 truck lines, 23 oil well drilling contractors, and 21 trucking contractors. 28 trailer camps and 29 oil camps were located in surrounding Ector County. According to a 1958 dissertation on Odessa’s urban development:

One of the major industries of Odessa is the distribution of oil field supplies, it being the largest oil field supply concentration point in Texas, as well as a major distributing point of all other commodities over a wide area. Products are principally live stock, crude oil, and oil products...marketing under strict proration approximately $1,000,000 per month of crude oil alone. With four large casing head gasoline plants that add to this figure with constant shipments of raw casing head gasoline, the gross sale of oil and oil products exceeds considerably the above figure.

The accessible, structured urban landscapes created through the expansion of oil transport networks increasingly enforced social hierarchies within both cities. In particular, boundaries of race became codified into law. Further, better roads, better communication, and the emergence of local bureaucracies made existing laws enforceable for the first time. Urbanization, record keeping, and regularly staffed law enforcement offices made this system more rigid by the later years of the Depression. By the 1930s, Both Midland and Odessa had explicit segregation laws for everything from school attendance, to job hierarchies, to separate drinking fountains. Oral histories described job segregation. Walter Cline and James Kinnear remembered that black men were barred from working on the rigs and instead worked as janitors or personal servants. Others remembered that black women would regularly solicit door-to-door asking for

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135 Arnoldo Deleon, Tejano West Texas.
work and as nannies. William Wolf remembered a black man named Bracy who was often hired to cook for important oil company visitors. Separation in the workplace was reinforced by refusal to sell real estate to black families. This restricted them to the outskirts of the region’s oil towns. The spatial boundaries of segregation reinforced existing jobsite hierarchies that prevented nonwhite workers from advancing beyond unskilled laborers.

Although the almost complete lack of census data suggests that the non-white population of the Permian Basin remained small before World War II, such divisions were deeply felt. Urban race relations in Texas were influenced by 1920s antipopulist campaigns. State elites, feared a coalition between working-class whites and the state’s large black minority population. They attempted to preempt a burgeoning class war by exacerbating racial divides in the cotton producing Eastern half of the state.

Throughout this period, The Ku Klux Klan intimidated black communities in Dallas and poll taxes were on the books in many Texas cities. Prominent Texas legislators pushed for stricter immigration laws based on scientific racism, pushing for explicit federal eugenics

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legislation.\textsuperscript{141} Any potential discontent in oilfield communities stemming from the extreme disparity in living conditions between newly arrived oil administrators, established landholders, or itinerate oil laborers was kept in check by strict racial hierarchies that placed white workers of any stripe above people of Latinx or African descent.\textsuperscript{142}

Support for segregation, anti-populist individualism, and opposition to government intervention into the industry were intertwined for Permian Basin elites. Throughout the 1930s, local faith in free enterprise to work toward the common good was bolstered by the Texas governor and state legislature, who led virulent attacks against the Works Progress Administration, the National Recovery Act, and other federal programs. Many in the legislature accused Roosevelt of communist ties.\textsuperscript{143} Although some oil industry elites approved of Roosevelt’s regulatory measures, people in the Permian Basin were harder to convince. Years of conflict between the oil industry and the federal government over oil regulation coupled with the common Texas’ belief that


\textsuperscript{142} Industry oral histories from the 1910s and 1920s describe Lynchings and efforts to “run the negroes out of town,” in South Texas. James W. Kinnear, interview with William A. Owens, July 16, 1953, Beaumont, Texas, Oral History of the Texas Oil Industry Records, Briscoe Center for American History, University of Texas, Austin Texas.

\textsuperscript{143} Although the Texas legislature mythologized working class individualism and pushed classless, anti-elitism, like federal intervention into oil production, the New Deal’s sweeping economic controls angered many as a fundamental intrusion. Keith Volanto, “The Far Right in Texas Politics during the Roosevelt Era,” in Cullen and Wilkinson, \textit{The Texas Right}, 68-86.
oil regulation was a tool for exploitative monopoly made locals reluctant to accept federal intervention of any kind. This opinion was only reinforced as oil boom returned to the region once again after 1935, bringing prosperity in a time of national economic stagnation.

Historians increasingly agree that the origins of contemporary Texas conservatism date back much further than opposition to Roosevelt and his policies in the 1930s. In particular, from the 1880s onward localized government, the religious right, and racial hierarchies dominated Texas politics. These beliefs were intertwined with a strident Texas nationalism that sought to remove any traces of Mexican or Latinx history. In the Permian Basin, a belief in localism and individual perseverance was reinforced by twenty years of hard living in dangerous and rough oil towns which was preceded by twenty more years of drought, isolation, and poverty. During the Depression, infrastructural improvements brought by oil expanded and the industry rebounded despite accusations of oil industry monopoly and industry exploitation. With support for industrial improvement and racial segregation linked in West Texas party politics, oil companies were understood

144 A 1934 article in the Abilene Reporter News by Roger Bagson, former president of the API, described the positive impact of the NRA oil regulation, “One of big things they see is regulation preventing strikes which they see as being very bad for consumers.” Roger Babson, “Control Proves Boon to Oil Industry; With Production in Hand, Prices are Doubled,” Abilene Reporter News, May 4, 1934, Abilene, Texas, 15.
146 Max Krohmal articulates pushback against these beliefs in Blue Texas: The Making of a Multiracial Democratic Coalition in the Civil Rights Era (Chapel Hill: The University of North Carolina Press, 2016).
as benefactors working with the region’s white residents to transform a dangerous, under-populated desert into an ordered, racially-white industrial zone.\footnote{See Monica Perales, \textit{Smeltiertown} for Tejano and Mexican pushback against a white narrative linking industrialization and racial politics.}

The onset of the Second World War helped to solidify these connections between oil, improvement, and civilization, with federal infrastructure building projects rapidly expanding Permian Basin urban centers and industrial operations. The war also stymied state and federal efforts to regulate the industry, setting the stage for massive industry expansion during the 1950s. By the time the US officially entered World War II in December 1941, the immediate need for aviation gasoline quickly ended any lingering oil glut brought about by East Texas overproduction. It also ended regional and national debates about control over oil transport networks. Between 1941 and 1945, oil network continued to increase, extraction rates broke new records, and the staunchly anti-regulation Texas legislature, through expediency, accepted drastically expanded federal involvement in the industry.

Federal involvement did not mean federal control. Much of this expansion was the result of cooperation between big oil companies and desperate federal officials. Although American overland pipeline networks had expanded during the 1930s, the majority of US crude oil and refined products still traveled to the East Coast via tanker ship. By 1940, a German maritime blockade prevented Texas oil tankers from reaching the East Coast and threatened a massive disruption in the domestic oil supply. To thwart the blockade, federal officials in the newly formed Petroleum Administration for War (PAW) quickly backpedaled on a decade of industry regulation efforts, scrambling to win
partnerships with large US oil companies – and access to the oil industry’s infrastructure networks, money, and logistical manpower.

As early as June 1941 President Roosevelt formed what would become the Petroleum Industry War Council (PIWC), made up of the CEO’s of the nation’s largest 72 largest oil companies. PIWC members controlled the largest and most technologically sophisticated oil transport and refining networks and, in the name of increased efficiency, the PAW offered PIWC members prime government contracts to immediately expand the US oil transport network.¹⁴⁸

According to the official PAW history, this partnership resulted in a “transportation and distribution revolution” in which all branches of the industry collaborated to create a system that could accommodate constant extractive expansion. Since West Texas was the site of significant proven oil reserves, regional pipeline building spiked once again during the war. The PAW requested the construction of a pipeline that reached from Jal, New Mexico to Midland, Texas, then on to Cushing, Oklahoma. Work on the pipeline was a joint project between Shell Oil, Sincere, the Texas Company, and the Empire Pipeline Company.¹⁴⁹ In 1941, the federal government

¹⁴⁸ Predicting the US entrance into the war, this effort began before December 1941. In June of 1941, President Roosevelt and secretary of the interior Harold Ickes called a meeting with several oil industry executives, hoping to repair their strained relationship. Ickes further reassured the committee that cooperation was in their best interest. He described plans to have the industry manage itself, arguing that “the full resources of the industry would thus be enlisted on a cooperative basis; at the same time, orders and regulation would be kept to a minimum, and the greatest possible reliance placed upon voluntary compliance and support.” Petroleum Administration for War, A History of the Petroleum Administration for War, 38, Engineering and Development, Series 10, Arthur E Pew Jr., Sun Oil Company Collection, Hagley Museum and Library, Wilmington, Delaware.

¹⁴⁹ Shell Oil Company, Pipeline Construction Laying Pipe, n.d., Box 19, Collection 711, API Photo and Film Collection, Smithsonian Archives Center, Washington, D.C.
contracted Magnolia Petroleum Company, by then a subsidiary of Standard Oil, to build an eight-inch line from Mallet Station in Cochran-Hockley Counties to Seminole, Texas. The next year Magnolia built a twelve-inch line from Corsicana to Midland, Texas.\(^{150}\)

Similar projects significantly expanded the national oil infrastructure, moving large oil companies into communities without producing oil fields. This increase in efficiency amplified the oil industry’s geographic impact across rural America. The expansion of overland oil pipeline networks had the most invisible and unexpected consequences. With Texas and Oklahoma the centers of American crude oil production and the majority of refineries in New Jersey, the PAW oversaw the expansion of a US pipeline network stretching across the much of the Midwest and rural South. This expansion required the creation of new “trunk lines” as well as the expansion of a spidery network of feeder lines serving these larger trunk lines. Two trunk lines, the “Big Inch” and “Big Little Inch,” became the public relations showpieces of this expansion project, billed as demonstrating the industry’s efficiency and technical sophistication.\(^ {151}\) A new system of temporary gathering lines – designed to gather oil from isolated or underproducing districts into consolidating storage tanks – was built linking previously unprofitably remote fields with

\(^ {150}\) Magnolia only sped up this pipe-building trend after the war, building five more lines connecting remote Texas fields between 1947 and 1955. Reports, Folder ‘History of the Magnolia Pipeline Company,’ Box E222, Exxon Mobil Collection 2.207, Briscoe Center for American History, University of Texas.

\(^ {151}\) Construction on the 1254-mile Big Inch pipeline began in August 1942 and took just 350 days to complete. The Little Big Inch took only five months to build. During the war newsreels, periodicals, and direct mail leaflets carried photos of pipeline construction – images of furious ditch digging, river fording, brush clearing, and pipe laying – into homes across the nation. For example see “Pipelines Planned to Relieve Threatened East Coast Shortage,” *World Petroleum*, June, 28-31, Box ’A. E. Pew Jr., Box 97 - War Emergency Pipeline,’ Series 10, The Sun Oil Company Collection, Hagley Museum and Library, Wilmington, Delaware.
the East Coast.

Before World War II, the US pipeline system was already sophisticated by global standards. In 1935 it stretched 250,000 miles, with a little under half - 112,000 miles - devoted to crude oil transport. Another 3,500 miles of pipe moved refined gasoline and 150,000 miles transported natural gas. Wartime pipeline construction increased this network’s physical size by approximately seven percent, with the PAW laying, relaying, or reversing 17,684 miles of pipe.\textsuperscript{152} Comparing oil pipeline maps from 1941 with postwar industry maps demonstrates the geographic scope of US wartime pipeline development.\textsuperscript{153} Postwar map, demonstrate that the number of holding and feeder lines increased dramatically. Texas and other oil producing regions already maintained a relatively large number of pipelines. The geographic impact of pipelines in these regions was not significant. However, the intricacy and expansiveness of the national pipeline network increased markedly, rivaling the Postwar national highway system in both complexity and ubiquity and introducing oil pipelines into regions that had not previously included oil infrastructure.

Despite pre-war debates, few criticized either the federal government or major oil companies for expanding Major control over the industry. In the Permian Basin, massive wartime expansion reinforced the belief that oil produced progress and that white oil workers were participating in a process of civilizing that would uplift racial inferiors. Just as the industry had brought renewed stability after the hard years of 1929 and 1930, oil was helping to win global war. The language of wartime oil expansion, which touted an

\begin{footnotes}
\item[153] Ibid.
\end{footnotes}
industry-government partnership as saving Europe, was heavily coded in the language of empire and white-man’s-burden. This belief that oil produced civilization had been parroted in publications by the API and other industry magazines since the nineteenth century. For example, in “Petroleum: The Story of an American Industry” the API linked pipeline building to an American imperial mission, saying that:

Eskimo, Indian, Chinese coolie, jungle native, desert tribesman, all owe much to American lubricating oil which has made the operation of machinery possible anywhere on the globe. They owe much also to the American oil container, which has brought oil to remote places, and to the American oil lamp, which has shed light in the earth's darkest corners.\(^{154}\)

The author went on to explain that the massive demands of progressive industry justified the growth of the petroleum industry in the United States, “Within less than three-quarters of a century, whir of a million wheels, hum of a million machines, roar of a million factories blended in a plea for oil and more oil -- oil for light, oil for power, oil for heat, oil for fuel, oil for lubrication, oil for a thousand purposes.”\(^{155}\) Just as the petroleum industry had succeeded in civilizing rowdy oil personnel and racial inferiors in the West Texas desert, in the postwar period American oil companies would work to civilize the world.

Virtually all military and government officials agreed that control of oil production by the Majors resulted in increased efficiency and drastically reduced industrial waste. Of the estimated seven billion barrels of oil consumed by American forces over the course of the war, six billion came from US oil suppliers – and most of that shipped from Texas.


\(^{155}\) Ibid, 25.
According to the PAW, oil demand during these five years consumed the equivalent of one fifth of all oil produced in the US since 1859. By the end of the war, total crude oil production had increased by 27 percent and US refinery output had increased 30 percent. By 1945, US refineries were producing 35 million gallons of gasoline every day for military use alone. A crucial part of this expansion, Permian Basin oil production would only increase in the 1950s and 1960s.

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Despite the oil industry’s rough-and-tumble reputation, many in the Permian Basin saw the arrival and spread of the oil industry as a civilizing force for the region — as continuing a process started by the spread of ranching in the late nineteenth century. Throughout the 1930s, workers moved into towns and violence, transience, and crime decreased. Especially in Odessa and Midland the building of good roads, the running of phone lines, and drilling of water wells, allowed workers to live in less geographic proximity to oil drilling operations. In general, oil work got less immediately dangerous and physically taxing. While increasing infrastructure allowed oil workers to put down roots in the region, it also solidified systems of racial exclusion that had previously been relatively informal.

The pipeline building boom of the 1930s and 1940s drastically increased the industry’s economic and physical control in the Permian Basin and across the nation. Despite debates about pipeline monopoly and the rights of private property holders, vocal opposition to industry consolidation was minimal. They seemingly accepted an industry

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156 Total oil consumption by the Allies during the war is estimated at 22 billion gallons of gasoline and petroleum products. This number excludes Russia. Petroleum Administration for War, History of the Petroleum Administration for War, 25.
booster narrative that saw consolidation as a process that would bring community
stability and reduce extractive waste. New technologies that systematized the processes
of oil extraction and transport required increasingly precise human control over nature.
Unlike drilling rigs, oil infrastructure such as pipelines, storage tanks, and the pump jacks
that continuously drew oil out of the ground remained in place for years, sometimes
decades. Along with controlling the movement of oil from the field to storage facilities
and refineries, pipelines regulated the movement patterns of humans and animals and
limited the way land could legally be bought, sold, and manipulated. Oil pipelines
connected the isolated Permian Basin with urban centers and large oil companies.
Because they were most often built, owned, and operated by large oil companies,
pipelines reduced local control over regional land use and ecology.
During and immediately after World War II, American oil companies capitalized on the industry’s participation in the war to argue that benevolent, oil industry expansion promoted national progress and security. In the pages of magazines, newspapers, and shareholder reports, as well as on the floor of the US Congress and in the halls of the Texas Legislature, oilmen described themselves as fundamental to both victory and postwar prosperity. In 1943, even before the war was over, Donald Nelson, chair of the War Production Board exclaimed that, “the responsibility which rests upon the petroleum industry and the Petroleum Administration for War is a dramatic one, for it is nothing less than the responsibility for victory.”¹ In 1946, immediately after the war, the Petroleum Administration for War published the descriptively titled, *History of the Petroleum Administration for War*. In its first pages, the author declared that World War II was, “…from beginning to end… a war of oil.”² Throughout the 1950s and into 1960s, many publications continued to paint oil companies as war heroes vital to national security and domestic job retention. Especially in the Permian Basin, the expansion of refining and petrochemical technologies was seen as central to this effort.

The oil industry and the federal government collaborated heavily on research and development throughout the 1940s. New oil refining and processing techniques

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² Ibid.
transformed crude oil into a cheap, abundant base ingredient for the manufacture of plastics and rubber goods. In oil propaganda, these new applications were used to signal oil companies’ innovation, prudence, and competence. Beginning in the 1930s, academically credentialed engineers, scientists, and chemists became the heroes of this drama. In 1935, the API boasted:

Today the geologist, paleontologist, geophysicist, and engineer cooperate in locating oil deposits in developing new fields, and in producing oil. Science constantly is applied from the time drilling begins, not only with the idea of finding oil, but with the additional objectives of recovering as much as possible, preventing waste, extending the producing life of wells and fields, and making the widest possible use of both oil and natural gas.³

Similarly, the cover of the 1939 *Dallas Morning News* included a full-page photo montage of backlit scientists in white coats, some dressed in protective suits, others working with pipets before a wall of bubbling chemicals. The headline read, “The Moderns Search for Oil in Sequestered Laboratories.”⁴ Such images further distanced oil production from its rough-and-tumble past and reframed oil exploration as the work of credentialed experts. Attempting to replace both itinerate, risk-taking roughnecks and moustache-twirling robber barons, these texts described oil and its discovery as fully controlled by measured, temperate, men of science.


⁴ “Oil: The Moderns Seek it in Sequestered Laboratories,” *Dallas Morning News*, September 17, 1939, Dallas, Texas, 1.
In this chapter, I demonstrate that World War II was a turning point for West Texas. Much-lauded wartime developments in refining science and technology allowed the Permian Basin to expand the market for oil and natural gas, increasing regional wealth and oil’s political and economic power. A refinery and petrochemical plant construction boom brought more oil industry jobs to the region even as industry consolidation continued throughout the 1950s and 1960s. This trend is most clearly illustrated through the development of the El Paso Petrochemical Complex in Odessa, Texas, billed as the largest inland petrochemical plant in the world. El Paso Corp leveraged a narrative of wartime efficiency and capability, hoping to solidify a link between resource conservation, corporate consolidation, and constant industry expansion in the minds of locals. In the national media, this narrative was intended to drain political momentum from a century of antimonopoly agitation and resource conservation legislation with a narrative of constant industry growth and consumer abundance. As federal regulators renewed lawsuits over oil drilling rights and pushed for stricter oil conservation laws, local industry boosters framed postwar industry expansion projects as the result of new technologies that had removed the physical constraint of a finite oil supply.

Second, I show that in contrast to oil workers on the Gulf and in other parts of the US, Permian Basin locals were largely uncritical of the industry’s constructed tech utopia. Nationally, growing legislative opposition to collective bargaining coincided with increased unionization among refinery and petrochemical workers immediately after the war. While a 1952 Shell refinery strike was a watershed moment, in the Permian Basin union membership remained well below the already low Texas state average. Nation-
wide, oil companies deployed a mix of Cold War patriotism, corporate paternalism, and appeals to rugged individualism. In the Permian Basin, oil companies worked to demonstrate industry respectability, technical competence, and community-mindedness. Together, these efforts bolstered the region’s opposition to oil union health and safety activists during the 1950s. Further, reminders of oil’s civilizing effect on the region demonstrated to many that oil companies would deal fairly with employees and the environment as well.

This chapter engages heavily with the growing body of scholarship on oil’s twentieth-century, political and ideological power. Matt Huber and Timothy Mitchel see the logic of oil extraction and sale undergirding capitalist models of constant growth and narrative of individual, economic achievement.\(^5\) Scholars of oil consumption including Bob Johnson and Stephanie Lemangier have remarked upon the postwar pervasiveness of oil in everyday life, noting the cultural significance of disposable, oil-based commodity goods.\(^6\) I demonstrate the ways in which postwar narratives of abundance and infinite consumption influenced the communities who made this cultural milieu possible. In the Permian Basin, oil companies were joined by regional and local chambers of commerce and civic organizations that reminded residents that petroleum technology and science were inextricable from the region’s imagined future, “The Texas oil boom transformed the world and what it could be,” the Odessa American opined, “It took the Lone Star State from a poor agriculture-centered, and in many ways backwards, corner on the

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United States to the giant of industry, technology, energy and politics that it's known for today.”

Stories of the region’s growing respectability and sophistication were paired with rising wages and increasingly conspicuous consumption. Visions of technologically advanced refineries, petrochemical plants, and an increasing array of colorful petroleum goods, overshadowed older images of the alcoholic roughneck engaged in a dangerous and dirty fight with nature. Instead, such statements painted the region's oil workers as technically proficient and as participants in the national push toward modernity and global leadership.

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Beginning in the 1930s, new oil refining techniques and advances in chemical knowledge made the processing of crude oil much more efficient. These techniques increased gasoline, kerosene, and fuel oil production and redefined oil as a building block for hundreds of synthetic materials. Researchers at Sun Oil’s Marcus Hook, Pennsylvania lab began the experimental development of synthetic rubber and heavy-duty plastics from crude oil during the Depression. During World War II, the federal government jumpstarted further research, asking the industry to find synthetic solutions to massive shortages in aviation fuel, gasoline, and natural rubber. In June 1941, Secretary of the Interior Harold Ickes sent a memo to leaders of the largest American oil companies alerting them that all patents filed in the US by enemy combatants were suspended for the

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8 “Copper and Brass in the Petroleum Industry,” Box 6, Collection 60, Rubber, Warshaw Petroleum Collection, Smithsonian Archives Center, Washington, D.C.
duration. This included patents on synthetic rubber and new thermal cracking processes, crucial to more sophisticated refining methods. Ickes and the Petroleum Administration for War (PAW) obtained Justice Department approval for a patent sharing program among US oil companies, then called upon oil companies to collaboratively develop these technologies.\(^9\)

In 1941, the US had approximately 400 refineries nationwide, most working with antiquated cracking technologies and unsuitable for use in the production of 1,000 octane gasoline. Because large oil companies – in particular, Standard Oil, Sun Oil, Gulf Oil, and the Texas Company – controlled almost all of the nation’s refineries and pipeline networks, the Majors received the majority of research and development funding and federal contracts to operate a new network of oil refineries, rubber plants, and chemical processing facilities.\(^10\) The Texas Gulf was already one of the largest refining centers in the country and wartime expediency only expanded operations. For example, construction on the Neches Butadine Products Company at Port Neches, Texas was finished in 1944. Although the federal government oversaw construction of the plant and two adjacent copolymerization plants, the three plants were operated by Gulf Oil, the Atlantic Refining Company, the Pure Oil Company, Socony-Vacuum Oil, and the Texas Company who all agreed to collaborate on the development of rubber substitutes and

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\(^9\) Telegrams from J. Howard Pew to J, Edgar Pew, June 1941, Folder 892.116 DIS.1 War Emergency Pipeline 1941-1945, Box 97, A. E. Pew Jr., Collection 10, Sun Oil Company Collection, Hagley Museum and Library, Wilmington, Delaware. See also Correspondence, Box 82 and Box 86, A. E. Pew Jr., Sun Oil Company Collection, Series 10, Hagley Museum and Library, Wilmington, Delaware.

\(^10\) While most research was into the creation of cheap 1000-octane fuel for fighter jets, the development of synthetic rubber and plastic had a lasting impact. “Copper and Brass in the Petroleum Industry,” 4-9, Box 6, Collection 60, Warshaw Petroleum Collection, Smithsonian Archives Center, Washington, D.C.
other synthetics.\textsuperscript{11}

Although collaboration between oil companies ceased after the war, the postwar industry benefited from massive wartime infrastructural and technological growth. All told, the government and industry together spent over $1 billion (approximately $13.4 billion in 2017 dollars) on refinery expansion, equipment upgrades, and research during the war.\textsuperscript{12} Many of these federal facilities were sold at auction to private industry, often at cost. This included an array of machinery and equipment, as well as 29 refineries and chemical production facilities.\textsuperscript{13} Oil companies scrambled to obtain exclusive rights to the more efficient cracking processes developed during wartime. By the early 1950s, all the Major oil companies had opened petrochemical and synthetic research and manufacturing facilities. With full access to previously restricted chemical research and control over freely given facilities, US oil companies quickly reduced oil refining waste and turned toward finding a consumer market for newly-developed synthetic rubbers and plastics.

Along with the preexisting Houndrey Process, several new cracking processes were developed in the 1950s. These included Socony-Vacuum’s “magic bead” catalysts used in cracking; the “fluid” catalytic cracking process developed during the war; new innovations in thermal cracking; and others methods patented by several different oil

\textsuperscript{11} “WWII,” Folder ‘Histories Publications: History of the Refining Division 1957,’ Box 2.207/E222, Exxon Mobil Historical Collection, Briscoe Center for American History, University of Texas, Austin, Texas.

\textsuperscript{12} Petroleum Administration for War, \textit{History of the Petroleum Administration for War}, 193.

\textsuperscript{13} This represented $236,000,000 worth of machinery including 14 catalytic crackers, 19 alkylation units, and 15 isomerization units. Petroleum Administration for War, \textit{History of the Petroleum Administration for War}, 213.
companies. In particular, the refinement of the catalytic cracking process dramatically increased the array of chemical compounds that could be extracted from crude oil and natural gas. Such efforts to crack natural gas resulted in a cheap, synthetic solution to the nation’s rubber shortage. Cracking natural gas was similar to oil refining. Liquefied natural gas was pumped into a series of fractionation towers then heated to specific temperatures. After cracking, it was sent to copolymerization plants to be combined with other chemicals. These combinations allowed for the creation of an array of new materials. Polyvinyl chloride (PVC) was vital to military operations and quickly came to be sold as a building block of the construction industry. Butadiene, the main ingredient in synthetic rubber, is a byproduct of ethylene. In the late 1940s, it was created through specific application of the steam cracking process. In the 1950s neoprene was used to coat the interior of oil tankers to prevent corrosion and B. F. Goodrich advertised vinyl as a preservative coating for everything from fresh fruit to Christmas trees.

While chemical companies were at times hard pressed to find domestic uses for these new products, the ability to market their work as the product of the war effort was a

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common – and compelling – tool during the following decade.\textsuperscript{17} Even as the war raged on, oil companies sought public praise for these technical achievements, hoping to use wartime patriotism to garner positive sales.

Federal officials were quick to praise the oil industry’s cooperation and resourcefulness. Beginning in 1941, newsreels, government reports, and magazine propaganda focused on the grand scale of wartime oil operations, emphasizing the vast quantities of oil and other raw materials that oil companies efficiently managed. An official PAW press release, dated August 29, 1945, described the enormity of the Big Inch pipeline operation, “The 210,000,000 barrels of crude oil, which have been delivered by the “Big Inch,” during its two years of operation would have furnished enough gasoline to operate all passengers cars in the Eastern States on a ration basis for more than 400 days.”\textsuperscript{18} Publication such as \textit{The Petroleum Refiner}, \textit{Oil and Gas Journal}, and \textit{Petroleum Engineer} devoted extensive copy to the industry's infrastructure building projects.\textsuperscript{19} In these pages, the industry described itself as made up of benevolent patriots who sacrificed personal profit to provide an invaluable resource to the American people in their time of greatest need.\textsuperscript{20}

\textsuperscript{17} “Copper and Brass,” “Petroleum Industry furnishing the fuel to assure defeat of Japanese;” “Important Facts about Texas oil, 1943,” Folder ‘Pamphlets,’ Box 6, Collection 60, Warshaw Petroleum Collection, Smithsonian Archives Center, Washington, D.C..
\textsuperscript{18} “Press Release - Petroleum Administration for War,” August 29, 1945, E. Pew Jr Box 97 - War Emergency Pipeline, Series 10, Sun Oil Company Collection, Hagley Museum and Library, Wilmington, Delaware.
\textsuperscript{20} See also “Victory in the Making,” and Ickes, \textit{Fightin’ Oil}. 
With this narrative in mind, it is not surprising that during the war the Depression-era popular conversation about industry wastefulness and corporate oil’s monopolistic tendencies was largely forgotten. What is more interesting is that this industry praise, with a few notable exceptions, continued in the popular press for over a decade after the war ended. Oil industry propaganda fused images of postwar abundance and ever-increasing oil supply. Oil industry representatives reassured the public that patriotic industry expansion would translate into a constant flow of cheap oil for American consumers. In the June 1945 edition of *World Petroleum* the Petroleum Industry War Council (PIWC) ran an article titled ‘The “Big Inch” Pipeline Systems Tangible Contributors Toward Hastening V-E Day: Their War Mission Fulfilled.’ The article reframes East Texas overproduction during the 1930s, saying, “Fortunately for America, in pre-war years the petroleum industry had developed extensive reserves which were ready to release oil at a greater rate than they had ever been called upon to produce before.”

In this article, not only was massive waste, regional depression, and environmental destruction reimagined as an intentional, strategic advantage, but any hint that the US might run out of oil due to industry waste or ever-increasing consumption was sidelined by discussion of constantly advancing petroleum technologies.

Other publications assured members of the industry that oil companies would find a technological solution to oil’s finite nature. For example, the June 1957 issue of the Standard Oil company magazine *The Lamp* divided the oil industry’s history into three

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eras: the age of kerosene, 1882-1911; the era of gasoline, 1911-1939; and lastly “the age of expanding energy,” 1939-present. Emphasizing that petroleum had many uses beyond fuel, the author described oil as “the hinge of fate” and directly connected the expanding array of chemical products to the expansion of the US postwar economy.\(^2\) In such publications, managed and implemented by oil executives in the name of national security and global freedom, an explosion of technical innovation and industry efficiency had seemingly put an end to irresponsible, wasteful oil extraction. The success of industry engineers to develop new cracking technologies demonstrated the Majors’ technical competence and ability to promote industrial stability in the postwar era. Without stating exactly how, oil companies promised that unpredictable, wildcat drilling

and price shocks were a thing of the past and implied that government intervention into oil production was unnecessary.

For average Permian Basin residents, this new market for petroleum products meant more jobs, better pay, and an influx of newly available luxury goods. Permian Basin crude oil was high in sulfur, making the refining process more complex and gasoline production more expensive. As a result, the price of Permian Basin crude had always lagged behind other regions. However, the expanding petrochemical and plastic industries relied heavily on a steady supply of natural gas, which the region had in ample supply. The sudden marketability of Permian Basin natural gas in the creation of plastics and petrochemicals was an about-face for the regional oil industry. Before the war, natural gas had been considered a waste product only good for the preservation of well pressure in low-production oil wells. Until the postwar period, most natural gas was released into the atmosphere upon discovery. As natural gas became the base material in many household goods, local oil producers repurposed a prolific and often hazardous waste product into a lucrative raw material almost overnight.

This transformation solidified chemistry, the chemical industries, and the large oil companies engaged in chemical research, as economic benefactors for many in Permian Basin oil communities. Organizations such as the Odessa Chamber of Commerce articulated a direct connection between their new applications for natural gas, the expansion of petrochemical production, and local community development. In an early 1950s interview, Sidney Paige reminisced about the differences between the oil industry

23 “West Texas Plants,” Photographs, Box 42, API Photo and Film Collection, Col 711, Smithsonian Archives Center, Washington, D.C.
of the 1920s and mid-century. He echoed industry booster literature saying, “…today the engineering involved in producing oil requires the use of almost all of the scientists — chemists, physicists, paleontologists, mathematicians. It’s now carried on very scientifically, and they don’t miss many bets. I would say that they are far ahead of the mining industry in their use of science in discovering resources.”

Natural gas production was helped along by a regional refinery building boom and the meteoric expansion of oil extraction and processing operations. By 1943 every county in Texas was engaged in oil exploration and leasing. 168 of them produced oil. 86 only had exploratory drilling. The Majors’ presence in the Permian Basin increased, with Magnolia, Phillips, and Humble expanding their operations. While lack of transportation networks had made refineries slow to develop in the 1930s, a decade later the newly expanded pipeline network as well as increased demand for petroleum and natural gas spurred refinery building throughout the region. By 1944 the Phillips Petroleum Co. operated a refinery in Cactus, Texas and the Continental Oil Co maintained refineries in Denver City and Wichita Falls. Along with Magnolia Oil’s refining and gas production facilities throughout the region, in 1952 the Sid Richardson Carbon Co opened a gas plant in Kermit, Texas. By 1953 the Lone Star Gas Co had a gas plant in Shamrock and the American Potash Co opened in Dumas.

24 Boatwright, Tales from the Derrick Floor, 228.
25 “Important Facts about Texas Oil,” 5th Ed, January 1943, Texas Mid-Continent Oil and Gas Association, Dallas, Texas.
26 “History of Magnolia Pipeline Company,” Folder ‘Magnolia Petroleum Company: Histories Folder 1,’ Box 2.207/E222, Exxon Mobil Historic Collection, Briscoe Center for American History, Austin, Texas.
27 “District 4 & 5,” Box 1-45, OCAWU Records, Special Collections, University of Colorado, Boulder, Colorado.
The largest of these new facilities was the Odessa Petrochemical Complex, built in 1953 and advertised heavily as the largest inland petrochemical plant in the world. A focus on the Odessa Petrochemical Plant’s self-constructed development and expansion narrative over the course of the 1950s and 1960s demonstrates the maturity of Permian Basin community government and infrastructure by the postwar era. It also helps to contextualize local complicity with the industry’s increasing administrative, geographic, and political control.

Plans for the facility that would become the Odessa Petrochemical Complex began during the early days of the postwar oil boom. The project was conceived of and pushed heavily by the Odessa Chamber of Commerce. In 1952 the Chamber enlisted local banker and oil financier William D. Noel to lead a multi-tiered effort to facilitate petrochemical development in the area. Citing the small regional population and distance from large industrial centers, Paul Kayser, then president of the El Paso-based El Paso Natural Gas Corporation, agreed to fund the construction of an initial butadiene and styrene plant in Odessa only if the Chamber could demonstrate a regional market for at least 75 percent of the products produced. Confident that industry would breed further

28 While members of the oil industry made up the majority of the Odessa Chamber during the early 1950s, a mix of bankers, lawyers, and real estate brokers also held seats on the Executive Board. The 1953 Chamber President, Harold Downs, was a partner in the Downs-Clark Equipment Company that sold oilfield tools. Jesse Owens, member of the Texas Railroad Commission, Chamber Manager and 1952 mayor of Odessa, was instrumental in the push for a petrochemical plant, later leaving public service to work for El Paso Corp. In 1953, Odessa Mayor Fred Gage owned Gage and Cochran Real Estate. “Harold Downs Wins Odessa Mayor’s Job, Odessa American, April 7, 1954, Odessa, Texas, 1.; “Record Vote Seen for City Election,” Odessa American, March 30, 1952, Odessa, Texas, 1.

29 According to the 1950 census, the combined population of both Ector and Midland counties was only 67,800. US Census Bureau, “Characteristics of the Population – 1950,”
industry, Noel and his committee convinced the Akron, Ohio based General Tire and Rubber Co. to build a new plant in Odessa, becoming the main buyer of El Paso Corp petrochemicals.

In 1955, El Paso Corp began excavating the foundation for the Odessa Petrochemical Complex and Noel was elected president of the newly formed El Paso Natural Gas Products Inc. Upon its completion, the facility made El Paso Corp one of the largest single employers in Odessa and the massive industrial facility became the crowning jewel in the El Paso Corporation’s growing natural gas empire.

A pipeline company founded by Houston-based lawyer Paul Kayser in 1928, El Paso Corporation profited heavily from West Texas’s geographic isolation and the regional oil industry’s chronic lack of transport infrastructure. El Paso Corp’s first big contract was to build a pipeline system for the city of El Paso that would transport natural gas from wells in Jal, New Mexico to heat homes and businesses in El Paso’s growing industrial center. The company expanded during the 1930s and 1940s to become the main natural gas distributor in Texas. After World War II, El Paso Corp formed a natural gas production and distribution monopoly that dominated the Southwest and northern Mexico for much of the century.

Skilled at vertical and horizontal integration, El Paso Corp expanded beyond pipeline laying to build oil refineries and petrochemical facilities throughout Texas, perfecting the

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art of trapping and reusing residual gas – natural gas found accidentally during oil exploration – for industrial production. Through a mix of physical and ideological tools such as the laying of pipe, the building of refineries and chemical plants, the development of labor networks, corporate philanthropy, advertising, and signage, El Paso Corp’s natural gas monopoly visually, culturally, and economically linked the sparsely populated Permian Basin to an international system of speculative commerce and wealth extraction. By convincing El Paso Corp to build a new plant in Odessa, the Odessa Chamber positioned its urban labor and industrial market within El Paso’s growing corporate and commercial web.

Noel oversaw plant expansions throughout the 1960s with El Paso Products Co. absorbing Brooklyn-based Beaunit Co. in 1967 and the local Odessa Natural in 1968. By 1968 the Odessa Petrochemical Plant housed six companies, including Noel’s own El


Paso Products Company and the General Tire and Rubber Company, as well as Rexall Chemical Co, Shell Oil, Big Three Industrial Gas and Equipment, and a Morton Salt Brine Purification Plant. By 1970 the plant encompassed ten separate production facilities on two separate campuses, spread over 640 acres, and was valued at over $300 million dollars. Conflicting reports from this period record anywhere from 800 to 1400 people employed at the plant.

During the mid-1950s, the plant’s steady expansion coincided with the latest extraction boom in the Permian Basin. Waves of oil prospectors merged with the growing manufacturing and white-collar workforce in the cities of Odessa and Midland. The populations of both cities exploded between 1950 and 1960, increasing approximately 172 percent over a ten-year period. Most of these migrants were oil workers from other parts of Texas and the United States, either sent by large oil companies or looking for work in the oilfields. Even after oil extraction slowed again in the mid-1960s, new people continued to be attracted by the oil industry’s high wages, which, averaged $6,279 per year in 1965 compared with the state average of $4,058. In 1965, Odessa’s ten petrochemical plants represented the third largest concentration of petrochemical

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35 “TCEQ WST IHW 30142 Reports MF307606 Hydrogeological Investigation at the Xylene Tank area facility 28,” Microfiche, Archive, Texas Commission for Environmental Quality, Austin, Texas.
38 “Tables,” Folder ‘Statistical Records: 1965,’ Box 2E200, Mid Continent Oil and Gas Association Records, Briscoe Center for American History, University of Texas, Austin, Texas.
producers in the state, lagging only behind Houston’s industrial corridor. The refining sector featured more stable wages, better overtime pay, and shorter hours than oil drilling. Further, even when oil prices dropped, oil processing and refining was less susceptible to sudden layoffs and production shutdowns. In this industry climate, refinery and petrochemical jobs were in high demand. Although Odessa’s population boom would taper off again by the late 1960s, the Odessa Petrochemical Plant continued to provide the city of Odessa with high tax revenue and above-average median wages.

With household wealth rising exponentially over the course of the 1950s and 1960s, it is not surprising that many Odessa residents saw a direct connection between new applications for natural gas, the expansion of petrochemical production, and local community development. During this period, however, the local press took the link

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39 Harris County held 33 plants and Jefferson County held 16. Both counties sit within Houston’s extended metropolitan area. “Statistical Records: 1965,” Box 2E200, Mid Continent Oil and Gas Association Records, Archives, University of Texas, Briscoe Center for American History, University of Texas, Austin, Texas.

between industry and prosperity a step further, connecting petrochemical expansion to
established national narratives about the power of technology to improve upon the
natural. This dialogue built upon industry booster language established during and after
World War II, signaling that petrochemical production was fueled by an unlimited supply
of energy and represented a Cold War effort to develop an American technological
empire.

For its first twenty years, the Odessa Petrochemical Plant was described in the
pages of regional newspapers such as the *Odessa American*, the *Abilene Reporter-News,*
and the *Midland Reporter Telegram* as an engineering marvel, symbolizing Odessa’s new
status as a part of a modern, technical world. Simultaneously, tourist souvenirs such as
picture postcards, shot glasses, commemorative plates, as well as industry journals and
periodicals focused on the plant’s size, emphasizing its height and metallic enormity in
relation to the surrounding treeless landscape.⁴¹ The *Odessa American*, as the main news
periodical in Odessa and the surrounding Ector County, spearheaded this effort, regularly
reminding readers that the plant was “the largest inland Petrochemical Plant in North
America.”⁴² A typical *Odessa American* article from 1962 described a visit from El Paso
President Paul Kayser, Rexall’s President Justin Dart, and other industrial elites. Along
with assurances from Dart that Rexall had definite plans to expand production in Odessa,

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⁴¹ These tchotchkes were handed out at the regional industrial fair, the Permian Basin Oil
Show, or sold at gas stations and local motels to passing tourists. “Odessa Petrochemical
Complex,” “Bruce Court Odessa,” “Welcome to Odessa,” postcards, n.d., author
collection.
⁴² The *Odessa American* was first published in 1940 by local Texas historian, essayist,
and moral crusader R. Henderson Shuffler. In 1948, Shuffler sold the paper to Freedom
Communications Inc., an independent news conglomerate that owned several newspapers
in California and around the US.
Kayser described Odessa as, “one of the most important operations in the chemical industry.”\textsuperscript{43} A decade later, a 1974 article described a plant visit by French industrialists. The article emphasized the plant’s technical sophistication and geographic improbability, saying, “strangers are amazed at such a development in an area so devoid of readily available water.”\textsuperscript{44}

In fact, petrochemical production and oil refining did require a tremendous amount of water.\textsuperscript{45} Because of regional aridity and the toxicity of most local groundwater, petrochemical producers in the Permian Basin had to develop new water-saving techniques and cultivate reliable water filtration and transport networks to supply the plant. El Paso Corp very publically devised a system to use city wastewater as the plant’s cooling system, reducing total regional water use. According to the article, the French industrialists were interested in building a similar plant in the deserts of Algeria and were looking for water solutions. By emphasizing their attention to Odessa as an industrial model, the \textit{Odessa American}, the Chamber, and El Paso executives reminded readers of the plant’s global significance. These publications depicted the plant as a symbol of Odessa, a city that used the power of science to triumph over its isolated location and recalcitrant geography. Through the plant, Odessa was no longer simply a

\textsuperscript{43} John Sliney, “Financiers to Visit Odessa,” \textit{The Odessa American}, October 30, 1962, Odessa, Texas, 1.

\textsuperscript{44} “Complex is Growth Beacon,” \textit{Odessa American}, June 9, 1974, Odessa, Texas, 82.

\textsuperscript{45} This would have been a lot of water. For comparison, the Port Neches Butadine Plant built during the war consumed 308,000,000 gallons of water per day in its cooling system alone. In 2008, the Odessa plant used over 5 million gallons of groundwater in chemical processes in a single year. Port Neches Plant Brochure, Box F122, Collection 2.207, Exxon Mobil Historical, Briscoe Center for American History, University of Texas, Austin, Texas.; \textit{History of the PAW}, 193.; “TCEQ WST IWH 30142 Vol 001 Correspondence 2007-2008,” Microfiche, Archives, Texas Commission for Environmental Quality, Austin, Texas.
source of extractable raw goods – no longer just a transfer point for the interregional and international flow of wealth within El Paso Corp’s vast pipeline network. Instead the city and its inhabitants had become creators – builders of innovative industrial and consumer products.

Other news articles focused on the plant’s steady wave of expansion projects during the 1960s and 1970s. They described the increase in plant employees and rise in the number of companies who occupied facilities at the plant, characterizing these developments as clear evidence of progress and indicative of sustainable economic and infrastructural growth. In particular, the local press latched onto El Paso Corp’s national connections. Daily newspaper coverage was careful to mention El Paso’s sister plants in Louisiana and Tennessee when describing the company. Further texts regularly mentioned El Paso Corp and Rexall Corp’s network of production facilities throughout the nation, again situating Odessa within an interconnected industrial network.46 These articles rhetorically framed the Odessa plant as part of a larger corporate body, with all parts vital to the whole. Rather than signaling absentee corporate exploitation, such connections were designed to indicate Odessa’s growing importance and demonstrate that multi-industry connectivity would help shield the community from the oil industry’s notorious fluctuations in prices and the inevitability of regional oil depletion.

46 “Gas Firm President Speaks Here,” The Odessa American, November 17, 1967, Odessa, Texas, 29. Annual reports from El Paso Corp. illustrate the interconnectedness of El Paso’s operations as well as demonstrate that the company actively publicized its corporate web. In 1948, El Paso also built new gas processing stations in California. El Paso’s construction of the Petrochemical Complex in Odessa was part of a larger wave of company expansion in 1952 and 1953. Folder ‘El Paso Natural Gas Co Annual Reports 1948-1954,’ Company Annual Reports, Special Collections, Permian Basin Petroleum Museum, Midland, Texas.
Signaling local public support for such connections, during the 1950s and 1960s oil company officials came to dominate every part of the city and municipal government, replacing an established ranching elite in most elected positions. For example, El Paso manager W. T. Edwards was elected vice President of El Paso Products Co. in 1970. According to the *Odessa American*, upon his promotion, Edwards was also the past President of the Odessa Chamber of Commerce, the Odessa Kiwanis Club, Permian Basin Petroleum Association, Southern Little League, and the Odessa Country Club.47 The *Odessa American* supported this shift, praising the Permian Basin’s growing population of college-educated engineers and managers who were to lead the region in the creation of a technically integrated, industrial West Texas. Seen as effectively blending academic knowledge and modern science with a practical understanding of the importance of constant economic growth, press coverage described engineers as ideal community leaders and experts in the processes that would support the community.48

These engineers-cum-local-officials believed that municipal government existed to facilitate commerce, which was the central touchstone of civic life. In their voting records, Permian Basin officials were markedly pro-business and anti-government compared to other local government officials in Texas. They generally had the support of their constituents. In 1962, the arch-conservative, famously anti-integration General Edwin Walker won Odessa’s vote for governor over ex-oil industry lawyer John Connally in the Texas Democratic primary. In 1964, Ector and Midland Counties

48 The preceding one hundred years of oil engineering, in which engineers and working class oil drillers fought an industry-wide battle between academic and on-the-job knowledge is documented in Frehner, *Finding Oil*. 
represented two of only sixteen Texas counties (out of 254) to vote for Barry Goldwater in the 1964 general election. Throughout the 1950s and 1960s many of the city’s leaders were vocal members of the John Birch Society. \(^{49}\)

Exemplifying a desire to blend business management and community leadership, the local press lauded W. D. Bill Noel, President of El Paso Petrochemical Products as a kind of local father figure and folk hero. A 1963 article in the *Odessa American* described Noel as a patron of the arts, with the Odessa Chamber of Commerce naming Noel “Outstanding Citizen of 1963.” In 1965, the *Odessa American* reminded readers of Noel’s civic awards, taking care to remark that Noel spearheaded the establishment of the Odessa Petrochemical Plant “for the good of the people.” The article went on to explain that, “Noel has served as a member of the Texas Liquor Control Board; is a member of the Advisory Council of the Texas Business Administration Foundation; and a director of the Texas Tech Foundation.”\(^{50}\) In this context economic boosterism, support for education, and the policing of public morality were understood as deeply intertwined components of effective civic stewardship.\(^{51}\)


\(^{50}\) “Fish Engineering is Pioneer in Odessa Complex,” *Odessa American*, 1965, Odessa, Texas, n.p.

\(^{51}\) Regional philanthropy was expected from those who had success in the oil industry and was considered part of good citizenship by the general population. W. M. Allman and Mrs. Allman, interview, June 19, 1970, Crane, Texas, Oral Histories, Permian Basin Petroleum Museum, Midland, Texas.; George W. Ramer, interview, February 12, 1970, McCamey Texas, Oral Histories, Permian Basin Petroleum Museum, Midland, Texas.;
Odessa’s industry boosterism, racially-charged conservativism, and technological utopianism should be understood in contrast to the industry’s national reputation. At this level, both politically and culturally, oil was much slower to shed its earlier reputation as corrupt and exploitative. Popular films such as Giant (1956) and The Last Picture Show (1971) continued to describe lawless, violent men who made individual oil discoveries through a mixture of stubbornness and luck. While in the 1920s and 1930s oil prospectors were characterized as interlopers, swindling unsuspecting landholders and wasting precious natural resources, fifty years later movies, books, and television depict prospectors as incompetent, backwards bumblers. In particular, Texas oil wealth held this connotation. From the Bugs Bunny cartoon Oily Hare (1952), to Superman’s first feature film, Superman and the Mole Men (1951), mid-century popular media understood oil elites as technology-averse, bemused by the natural processes that produce oil, and subject to their own hubris.

The flamboyant Glenn McCarthy epitomized such connotations. McCarthy, who rose from nothing through a fortuitous oil discovery in West Texas was the impulsive, hard-drinking inspiration for James Dean’s character in Giant. McCarthy’s – and the industry’s – fame was epitomized by a Life magazine cover-story featuring Texas oil

James J. Wheat and George Clayton, interview, July 17, 1970, Mentone, Loving County, Texas, Oral History Collection, Permian Basin Petroleum Museum, Midland, Texas. In the Bugs Bunny short Oily Hare, Elmer Fudd’s bumbling oil tycoon cousin is desperate to remove Bugs Bunny from a rabbit hole located on top of oil deposits. His constant, inept digging – easily outmatched by Bugs Bunny – is a major source of humor. Superman and the Mole Men set Superman against a subterranean race of aliens who emerged from an unusually deep oil well. The movie played upon real popular debates as oil companies set several deepest-hole-ever records in the Permian Basin and Eastern New Mexico. Oily Hare, directed by Robert McKimson, Los Angeles: Warner Brothers, 1952.; Superman and the Mole Men, directed by Lee Sholem, Los Angeles: Lippert Pictures, 1951.
tycoons. On page one, McCarthy stood tall on his West Texas ranch, boots on, rifle cocked. McCarthy’s working class sensibilities and rugged, physical masculinity was tempered by continued public distrust.\(^{53}\)

Controversy about the right of private oil companies to profit from drilling in Federal waters further reinforced such images. In 1947, oil was discovered in the Gulf of Mexico on land claimed by both the state of Texas and the US federal government. Texas insisted that its right to the submerged oil fields stemmed from its history as a sovereign nation with federal officials arguing that state regulators would be prone to manipulation by local oil tycoons and the land should divert to federal oil reserves for safe-keeping.\(^{54}\) Fueling animosity on both sides, in 1949 accusations of explicit monopoly reemerged as the Hearings before the Subcommittee on Study of Monopoly Power of the Committee on the Judiciary concluded that control over oil transport networks by the Majors had only increased after the war.\(^{55}\) Industrial unions such as the CIO and oil conservationists, who saw the federal government as manipulated by the power of oil companies during the war, responded with virulent backlash. The offshore sovereignty debate continued into the mid-1950s when the US Supreme Court ultimately decided in favor of state and oil company control of offshore drilling.\(^{56}\) While few opponents during this period were explicitly concerned with the environmental impact of oil extraction and transportation,


\(^{54}\) Folder ‘Government Oil Lands,’ Box 76, Harvey O’Conner Papers, Walter Reuther Library, Detroit, Michigan.


\(^{56}\) “Offshore 1954,” Box 70, Harvey O’Conner Papers, Walter Reuther Library, Detroit, Michigan.
the belief that private oil companies could not be trusted to manage subsurface oil reserves remained a topic of mainstream public discourse.

Local Odessa depictions of El Paso Corporation explicitly turned these images on their head, demonstrating bureaucratic competence and control by benevolent, paternalistic oil corporations. These themes appear in El Paso Corp consumer product advertising throughout the 1950s and 1960s, with ads arguing that the power of science coupled with corporate expansion would usher Odessa, and its people, into a new technological future. A period-typical El Paso Products Co. ad from 1967 features a single image. A demurely-dressed, white woman sits amid a pastel cornucopia of household goods, presumably manufactured from El Paso petrochemicals. Below the image a caption reads, “Processing the past into your future.” Similar to petrochemical ads found in industry and employee periodicals such as Petroleum Week, Petroleum Refiner, or The Lamp, this ad focused on the final result instead of the industrial process, implying that through the miraculous processes of science, obsolete nature (crude oil and natural gas) could be brought – along with the rapidly industrializing Permian Basin – into a modern, synthetic age.

58 The majority of ads in industry periodicals are devoid of people. For example see “Matching Tubes to Jobs is a B & W Specialty, The Babcock and Wilcox Company, and “For your next project … avail yourself of practical experience,” Stearns-Roger, Petroleum Refiner: Oil Centennial Issue, 1959, Trade Literature Collection, Hagley
This ad was similar to oil industry consumer advertising industry-wide during the 1950s and 1960s. These images rarely included oil itself— or even oil producing technologies. Rather, they focused only the products that it produced. In 1963, a Mobil Oil Co ad connected the oil industry to space travel. The two-page spread held only two images with the caption, "oil propels golf balls and probes the moon." In such advertising the natural world was either a relic of the past, carefully out of sight and out of mind, or carefully managed by industry engineers and technicians. Similar sentiment was articulated in a news bulletin from the General Petroleum Company, “Today the department is known technically as the refining and manufacturing department because they go nature one better and actually manufacture from the crude oil products that mother nature herself hadn’t thought of.” Gone were images of lonely, gushing oil derricks, crowded and temporary towns, or oil-slicked workmen. According to industry narratives, oil did not exist outside of industry-controlled wells, pipelines, tanks, or refineries. It was not out of control, it was not wasted, nor was it visible to the human senses. Oil was only mysterious at the molecular level— to be investigated by scientists who worked to produce more efficient fuel or new, useful materials.

World War II and the industry’s massive propaganda offensive demonstrated to many in Congress and in the Permian Basin that waste and overproduction were most

Museum and Library. Petroleum Refiner, first published in 1942, was a product of Gulf Oil in Houston, Texas.
59 Mobil Oil Co., Advertisement, Folder ‘Mobil corporation subject files affiliates, Mobil Chemical Company: Petrochemicals Division 1956-1999,’ Box 2.207/F122, Exxon Mobil Historical Collection, Briscoe Center for American History, University of Texas, Austin, Texas.
60 General Petroleum Company, Advertisement, Folder ‘General Petroleum Corporation News Clippings 1955-1990,’ Box 2.207/E214, Exxon Mobil Historical Collection, Briscoe Center for American History, University of Texas, Austin, Texas.
efficiently conquered through further industry integration, not federal intervention. Just as oil had brought water, electricity, and wealth to the region over the past thirty years, many Permian Basin residents trusted that increased industry consolidation and technological development would continue to provide regional prosperity. The stability of regional refinery jobs would continue solidifying worker connections to the community and reduce the transient, migratory patterns of oil labor.

While such narratives made it easy for some to believe in constant industry expansion, it was harder for the industry story of benign oil company leadership to completely thwart national oil union expansion or silence union mobilization over the course of the 1950s. While as a rule few oil drillers ever joined industrial unions, refinery workers across the county had a long tradition of organizing. By the mid-1950s, two large unions had emerged to represent most of the refinery and petrochemical workers in the country, the Oil Chemical and Atomic Workers Union (OCAWU), and the International Chemical Worker Union (ICWU). As refining and petrochemical production moved into the Permian Basin, local industry elites watched state and national union action carefully.

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61 A competing union, the Ohio based International Chemical Worker Union (ICWU) also ramped up efforts to consolidate isolated unions in the Midwest and California during the 1950s. The ICWU emerged during this period in an effort to recruit across an array of industries. During their biggest recruitment drive in 1957, the ICWU recruited at plants that produced such diverse products as paint, explosives, processed foods, as well as petrochemicals. Although the ICWU recruited successfully in California, the Midwest, and Canada, the vast petrochemical centers along the Gulf were dominated by the OCAWU. In 1958, Texas membership in the OCAWU was significantly higher than the ICWU, with over 40 local branches – the most in the union – and represented 31,895 workers. *Oil, Chemical and Atomic Workers International Union AFL-CIO Fact Book*, Publicity Department OCAW-AFL-CIO, October, 1956, OCAWU Records, Special Collections, University of Colorado, Boulder, Colorado.
In the 1950s most oil industry union action was led by the Oil Chemical and Atomic Workers Union (OCAWU), the largest oil industry union in the United States. The OCAWU was officially born in 1955 out of a merger between one of the first large oil processing unions, the Oil Workers International Union (OWIU) and the United Gas Coke and Chemical Workers of America (UGCCWA). In 1956, one year after the merger, the OCAWU represented approximately 210,000 workers across the oil and chemical industries. From its inception, the merged union focused on “improving living conditions for all workers in the oil and chemical industries.” Increasingly in the postwar era, this meant focusing on improving workplace safety and worker hazard compensation programs.

The union that would become the OCAWU began in 1918 as the Oil Field, Gas Well, and Refinery Workers of America. The union formed in response to a bitter 1917 strike in East Texas that left dozens of people dead and towns throughout the region under martial law. Fred Jennings described police violence in response to the strike:

As that time went on and on we had a strike here in 1917, declared martial law and got a bunch of soldiers in here...They brought men in here by boat from Houston and put them to work in the oil fields and, of course, they had to keep martial law until the strike was over... And then the conditions got better, but the

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62 This merger was a part of the much larger merger between the AFL and the CIO. Philip Taft, “Independent Unions and the Merger,” Industrial and Labor Relations Review, 9:3 (1956).
63 Such efforts took place at a time of growing uncertainty for American industrial unionism. In response to growing hostility from management and the waning of federal support, the AFL and the CIO merged in 1955 in a strategic attempt to consolidate power. Oil, Chemical and Atomic Workers International Union AFL-CIO Fact Book, Publicity Department OCAW-AFL-CIO October, 1956, OCAWU Records, Special Collections, University of Colorado, Boulder, Colorado.
64 Ibid.
soldiers really kept them lined up.... It was several killings, but -- they got on the line, I'll tell you that.\textsuperscript{66}

Angered by reports of violence and their own low wages, workers in Texas, California, and Oklahoma were quick to join the union. By 1921 the union boasted over 30,000 members.\textsuperscript{67} After a sharp dip in membership during the early years of the Depression, membership continued to climb throughout the 1930s and 1940s.\textsuperscript{68} By 1945, almost one hundred percent of Texas and Louisiana Gulf Coast refineries were unionized, either with the OCAWU or another union.\textsuperscript{69}

The growth of the OCAWU parallels both increased union actions across the country during the Depression years and growing backlash against worker agitation in the popular press. For example, in November of 1929 the 3000 members of the Fuel and Gas Drivers Local 553 in New York City struck. The organization of gasoline and oil truck drivers called for an eight-hour day, higher wages, and overtime pay. According to the \textit{New York Herald Tribune}, the strike affected Standard Oil of New York, Gulf Oil refineries, Sun Oil, and Sinclair Refining Company, among other companies. The paper described violent altercations between striking drivers and replacements hired as strike

\textsuperscript{66} Fred Jennings, interview with William A. Owens, June 19, 1952, Goose Creek, Texas, Oral History of the Texas Oil Industry Records, Briscoe Center for American History, University of Texas, Austin, Texas.

\textsuperscript{67} \textit{Oil, Chemical and Atomic Workers International Union AFL-CIO Fact Book}, Publicity Department OCAW-AFL-CIO (October, 1956).

\textsuperscript{68} In 1948 the OCAWU began membership drives in Canada. Folder ‘Convention Proceedings & Reports,’ OCAWU Collection, Walter Reuther Library, Detroit, Michigan.

\textsuperscript{69} As scholars such as Emilio Zamora have shown, Texas had an active labor movement in the postwar era. Activism in oil has been less studied, but it is clear that the refining centers in Port Arthur and Houston were centers for unionization in the state. See also Ray Marshall, “Independent Unions in the Gulf Coast Petroleum Refining Industry—The Esso Experience,” \textit{Labor Law Journal}, 12 (1961), 823–40.
breakers. Many editorials expressed concern about fuel shortages in the city.\(^{70}\) The impact of union action on consumers was a common refrain against oil industry strikes during World War II, with refineries arguing that because their products were so vital to the nation, strikes would be disastrous.\(^{71}\)

In their boardrooms, oil companies downplayed the impact of increasing union power. A 1930 memo from Saucony-Vaccum executives to their investors offered reassurances that the relationship between labor and management at all Saucony-Vaccum plants was “friendly.” The company president argued that the Wagner Act would bring few changes to the tradition of “collegial negotiations” between elected workman leaders and management, “With two or three exceptions since the enactment of the Wagner Act there have been no marked disturbances in the generally fine relationship that has always existed between the management and nonsupervisory employees of this Company.”\(^{72}\)

However, beginning in the late 1930s, wages increased at US refineries in response to growing union membership and the improving economy. This consolatory trend continued into the war years, despite a nation-wide ban on strikes. For example, beginning in 1941, Socony-Vacuum implemented a new system of annual employee raises.\(^{73}\)

\(^{70}\) “City’s Gasoline Supply Menaced as Strike Grows,” *New York Herald Tribune*, November 11, 1929, Folder ‘Human Resources Employee Organizations,’ Box 2.207/E33, Exxon Mobil Collection, Briscoe Center for American History, University of Texas, Austin, Texas.

\(^{71}\) Signaling that the federal government agreed with this assessment, strikes were declared illegal for the duration of World War II.

\(^{72}\) “Employee Relations Socony-Vacuum Oil Company Incorporated, 1939-1940,” Folder ‘Human Resources Employee Organizations,’ 12, Box 2.207/E33, Exxon Mobil Historical Collection, Briscoe Center for American History, University of Texas, Austin, Texas

\(^{73}\) Ibid.
As the petrochemical industry expanded rapidly after World War II, a wave of union organizing took place in newly opened chemical plants. Immediately after the war, disputes erupted in refineries throughout Texas. In 1945, members of the International Oil Workers Union struck, calling for higher wages. Later that year a similar wage dispute erupted in Mobil Oil refineries. Things were most heated that year in the Midwest, with Socony-Mobil refineries completely shut down by strikes in Detroit and Chicago. In October, the President ordered the US Navy to take over any refineries with striking workers. Bad press created due to what would become the first postwar US oil shortage signaled to industry executives that their efforts to sell benevolent, technocratic oil bureaucracy might be more of an uphill battle than they had anticipated.

As refinery organizing continued in the postwar era, the industry doubled down on paternalistic rhetoric to employees in the pages of industry manuals and company magazines, even as industry management sought to further oil’s public image as a benevolent resource steward. The 1947 Socony-Vacuum employee pamphlet “So you want a Better Job” advised employees to, “Remember that the boss probably knows the job far better than you….” The author also advised against political opinions:

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74 “Communication and Public Statements in Connection with the rate dispute in Socony-Vacuum’s Refineries beginning in September 1945,” Folder ‘Human Resources,’ Box 2.207/E46, Exxon Mobil Historical Collection, Briscoe Center for American History, University of Texas, Austin, Texas.
75 “Who’s Right — and Who’s Wrong?,” Socony-Vacuum Oil Company, Folder ‘Human Resources Wages and Salaries 1945 Dispute 1945-1946,’ Box 2.207 E46, Exxon Mobil Historical Collection, Briscoe Center for American History, University of Texas, Austin, Texas.; “Average State Membership, Aug 1957-July 1958,” Box 4, Otto Pragan Collection, Oil Chemical and Atomic Workers Union, Col 617, Reuther Library, Wayne State University, Detroit, Michigan.
76 “Magnolia Family Little People,” Magnolia News, April-May 1951, 30-31, Oil Scrapbook Collection, Briscoe Center for American History, University of Texas, Austin, Texas.
Personal views can cause a lot of trouble. Remember then to keep them always conservative. The “isms” are out. Business being what it is, it naturally looks with disfavor on the wild-eyed radical or even the moderate pink.\(^{77}\)

In 1954, the Socony-Vacuum employee orientation handbook had similar advice:

> The company believes that: the well being of the community at large cannot be separated from the success or failure of the business community to exercise its stewardship of human and material assets with a sensitive regard for the ethical and social consequences to the individual employee.\(^{78}\)

Such industry efforts to control their labor force were only partially successful.

Into the 1950s, the OCAWU organized fierce union action in Texas’s largest refining hubs in Houston, Texas City, and Port Arthur, with workers continuing to dispute increasing hours and shrinking pay. Union locals also called for stricter safety and health regulations for oil and refinery workers. In 1952, the OCAWU launched a nationwide effort to secure industry-wide collective bargaining. Strikes at major US oil refineries began on April 30, ultimately halting production at one-third of all US refineries.\(^{79}\) This strike coincided with a United Mine Workers Strike that cut off 95 percent of the national soft coal supply and a conveniently timed decrease in foreign oil supplies. As a result, the strike produced a national energy shortage and fierce debate in

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the popular press. Although the OCAWU strike received backing at several levels from the federal government, this strike was successfully broken.

With this contentious history in mind, it is easy to contextualize the oil industry’s shrill postwar calls for decreased government control and West Texas boosterism that equated oil with futuristic, benevolent management as preemptive opposition to oil unionization efforts. Tellingly, workers at Odessa’s Petrochemical did not participate in the national strike. William Wolfe articulated a regional narrative that unions were a product of the big city and did not fit with Texas culture. He recited his response to Permian Basin union organizers from memory:

Let me tell you something mister, if I would be in a big city I would mind to buy [sic] what you are asking me, but you are in here and you are standing on my land. Now if you’ve decided you want to create something like they do in the big towns and hit somebody in the head, you better have those people whoever you are going to send out to take out plenty of insurance because they will all get killed around here. It’s a wide-open country.

Wolfe reported that unionization efforts in oilfields near McCamey were unsuccessful but admitted that workers at the town’s Humble refinery did strike on occasion. In response to this story, the anonymous oral historian asked Wolfe, “Wouldn’t you say, from the very beginning, that the oil business was a business of individuals and was not a collective

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81 This was a period of flux for global energy production. In 1951 the Iranian government seized the assets of the Anglo-Iranian Oil Company. Subsequent blockades created a 65 million barrel shortage in global production. While US domestic production increased after war, only half of the shortfall could be made up by US producers. This resulted in a massive decrease in air transport due to jet fuel shortages. Simultaneously, droughts in North America decreased the availability of hydro power. Timothy Mitchel, Carbon Democracy, Chapter 6.
enterprise? Every man stood on his own feet?” Wolfe agreed.82

Throughout the twentieth century, Permian Basin communities and oil workers distanced themselves from union agitation. Statistics from OCAWU organizing efforts in the region demonstrate this dearth of activism.83 In the wake of the 1952 industry-wide strikes, West Texas newspapers largely avoided mentioning local unions altogether despite the presence of several OCAWU locals at plants throughout the region. An illustrative exception to this rule is a private ad placed in the *Odessa American* by local oil contractor T. E. C. Bunch. Bunch reported that there was absolutely no conflict between labor and industry:

I believe the relations that now exist here in Odessa between contractors and organized labor are healthy and that no conflict exists or is anticipated between local contractors and local unions, and that ours is the American way of settling any differences that might arise.

Bunch went on to assure readers that the oil chemical and refining industries had, “a common purpose in our democracy--better living for all of us.”84

Analysis of the *Odessa American*’s public opinion pages, filled with anti-union diatribes and monologues supporting unchecked industry growth, suggests that many in the community agreed with the editors’ distaste for unions and saw unions as a threat to the region’s history of individual self-sufficiency and tradition of risk taking. An

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83 According to OCAWU records, between 1930 and 1990, the OCAWU held elections at 45 plants in West Texas including elections at El Paso Products Company, Cities Services, and Phillips refineries. Box 9, 21, 26-28, 32, 35, 37-38, 45, OCAWU District 4 & 5 Records, Oil Chemical and Atomic Workers Union Records, Special Collections, University of Colorado, Boulder, Colorado.  
exemplary 1957 Odessa op-ed described union representatives in apocalyptic terms, warning residents that, “they are here.” The author warned readers about union organizers’ standoffish and anti-community behavior, cautioning, “They will be standing or sometimes sitting in little groups.” The full-page essay ended by invoking unions as a threat to the economic cohesion of the community, warning readers that, “unions can’t possibly create wealth, except for their leaders.”85 Along with this anonymous writer, many in Odessa saw the region’s lack of unionization as a great boon to corporate efficiency, with cheap labor making Odessa attractive to industries looking to relocate to West Texas and contribute to the growth of the community.86 In contrast, unions were described as an inconvenience that delayed production and raised gasoline prices. Records of local industry votes to avoid unionization were documented with care in regional newspapers. In contrast, strikes were described as a “threat” and often paired with discussion of the importance of the oil industry to national defense.87

National industry organizations were even more proactive. In 1952, in the midst of the Tidelands Controversy and national refinery strike, the API launched the Oil Industry Information Committee (OIIC), designed to combat a lingering association between oil and exploitative monopoly. The OIIC began a nation-wide promotional tour, using theater, song, and dance to exonerate oil industry economic growth and

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85 “They Are Here,” Odessa American, May 13, 1957, Odessa, Texas, 12.
86 The Permian Basin was not alone in this strategy. Such rhetoric was used throughout the South by communities looking to draw manufacturing industry away from established industrial union systems along the Atlantic coast and in the Midwest. Timothy Minchin, What Do We Need a Union For?: The TWUA in the South 1945-1955 (Chapel Hill: University of North Carolina Press, 1997).
demonstrate the industry’s connection to small-town America. In these texts, the API focused on petrochemical production as making the industry indispensable to everyday American families.\(^88\)

People in the Permian Basin were quick to demonstrate their support for the campaign. The city of Odessa sponsored the largest rally of its kind in the country to welcome the API boosters. Seeking to demonstrate that the oil industry was a fundamental part of Permian Basin culture and community, the event culminated in a city-wide barbeque facilitated by “local high school bathing beauties” and the presentation of the “largest vat of baked beans in the world” served from a pot made at an Odessa oil industry machine shop.\(^89\) The American Petroleum Institute led a vocal public outreach campaign, hoping to reinforce a belief that government regulation of extractive industry inhibited scientific discovery, was un-American, and tantamount to communism.

While it is clear that in the 1950s most Permian Basin workers did not rally behind union efforts to improve health and safety conditions, a look at daily work practice in the Odessa Petrochemical Plant and other regional refineries reveal the highly

\(^88\) Box 69, API Photo and Film Collection, Col 711, Smithsonian Archives Center, Washington, D.C..

\(^89\) “Odessa Oil Progress Week Observance Expected to Rank as Nation’s Largest,” *Odessa American*, October, 12. 1952, Odessa, Texas, 1.
dangerous nature of these jobs. Although records for the Odessa Petrochemical Complex are unavailable, a look at employee handbooks and insurance manuals for similar Texas petrochemical plants reveal standard operating practices at the General Tire and Rubber Plant, the Shell oil refinery, or the Morton salt brine distillery during the 1950s and 1960s. The jobsite hierarchy ranged from manual laborers at the bottom, semi-skilled and skilled tradesmen who received a daily wage, an elite class of salaried managing engineers, and largely absentee company CEOs at the top. The skilled and semi-skilled technicians made up much of the workforce. They spent the majority of their time monitoring and servicing the complex chemical distillation machinery. On a daily basis, workers measured chemical reactions, watched temperature gauges, operated heavy machinery, or maintained or replaced machines. In the process, employees came into contact with large quantities of hot-to-molten raw liquids, alternately heating or cooling them through the manipulation of steam valves or by adding various catalysts to create specific chemical combinations. By the mid-1960s the Odessa Petrochemical Complex began using early computers to measure these chemical combinations and to monitor equipment gauges. However, few parts of the plant benefitted from such automation.

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90 Press Releases, Folder ‘Mobil Corporation: Subject Files Affiliates Mobil Chemical Company Phosphorus Division,’ Press Releases, Folder ‘Mobil Corporation: Subject Files Mobil Chemical Company Plastics Division,’ Box 2.207/F122, Exxon Mobil Historical Collection, Briscoe Center for American History, University of Texas at Austin; “Industrial relations 1940-1943,” Folder ‘General Petroleum Corporation,’ Box 2.207/E214, Exxon Mobil Historical Collection, Briscoe Center for American History, University of Texas, Austin, Texas.

91 Flow Charts, Folder, ‘Exploration and Producing,’ Box 2.207/E221, Exxon Mobil Historical Collection, Briscoe Center for American History, University of Texas, Austin, Texas.

92 Press Release, Folder, ‘Human Resources: Education and Training Learning about Computers,’ Box 2.207/E33, Exxon Mobil Historical Collection, Briscoe Center for American History, University of Texas, Austin, Texas.
and work remained intensely physical.

Such documents also reveal that there was little to no standardized regulations governing long-term employee exposure at petrochemical plants before the early 1970s.\footnote{In contrast to lukewarm concern for employee health, Hugh Gorman argues that pollution remediation efforts start much earlier at oil refineries across the country. Gorman, \textit{Redefining Efficiency}, Chapter 9.} Workplace regulations differed depending on the company. Refinery and petrochemical workers often wore only minimal breathing or fire protection gear when in close proximity to chemical fumes, distillation equipment, or raw materials.\footnote{Manuals, Folder, ‘Human Resources Employee Relations: R&D Supervisors Manual ca. 1950,’ Box 2.207/E39, Exxon Mobil Historical Collection, Briscoe Center for American History, University of Texas, Austin, Texas.} According to worker testimonies filed with the Oil Chemical and Atomic Workers Union during the 1960s, inadequate individual or atmospheric protective equipment at Texas petrochemical plants produced an array of immediate health hazards for workers.\footnote{Notes, Folder, ‘BP 78-4109,’ Box 10, OCAW Tony Mazzocchi Collection.; “Notebook,” Box 1, OCAW Tony Mazzocchi Collection, Special Collections, University of Colorado, Boulder, Colorado.} Crude oil and natural gas are corrosive materials that can damage human skin. Constant exposure resulted in surface burns. Methane, sulfur, and other gasses released when storage tanks were opened were highly toxic, causing a loss of consciousness and death after only short-term exposure.\footnote{The dangers of sulfur gas were well known dating back to the 1920s. For example, see E. N. Beane, interview, 1970, Crane, Texas, Oral History Collection, Permian Basin Petroleum Museum, Midland, Texas, 21.} Without fire-protective suits, burns from superheated liquids, overheated pipes, or pressurized steam releases were common.\footnote{“Notebook,” Box 1, OCAW Tony Mazzocchi Collection, Special Collections, University of Colorado Boulder.; “Union News,” Box 5 1968-69, Archives, Walter Reuther Library, Detroit, Michigan.}

While this lack of concern seems at odds with a community narrative of oil
company benevolence, it reveals a highly individualistic understanding of workplace safety that bears the influences of the high-turnover, contract-based, oil drilling industry. A 1949 Magnolia company magazine profile of Wilburn Dickenson Orr, foreman of Magnolia petroleum’s Beaumont refinery described the early years of Texas oil refining using language similar to descriptions of drilling operations:

Orr wastes no tears on it but he will say that is he one of the few refiners left from the devil-may-care, hard-living and hard-working days when refining was by-guess-and-by God. He and…not too many others are still left from the rip-roaring days when science textbooks hadn’t entered into refining and when differences of opinion were settled with flying fists after the whistle.  

Such allusions to violence, improvisation, and individual accountability are analogous to the experience of workers on drilling rigs. OCAWU testimonies described similar refinery conditions throughout the state.  

Since the 1920s, refinery managers along the Texas Gulf worked to foster employee autonomy as a way to avoid expensive hazard mitigation programs. Simultaneously, managers recognized that too many worker deaths or injuries could lead to worker unionization. In an effort to merge a narrative of individual autonomy with corporate benevolence, managers in Texas’ union-prone Gulf Coast refineries standardized workplace policy and created workplace conduct guidelines to mitigate refinery accidents and improve employee retention. Refineries instituted accident tracking programs, hazard insurance, and standardized employee training. As early as

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98 “Men Who Make Magnolia,” *Magnolia News*, February 1950, 14-15, Box 2.207/E224, EXXON Mobil Historical Collection, Briscoe Center for American History, University of Texas, Austin, Texas.
1922 Socony Oil’s company magazine, the *Socony Flash*, began publishing accident reports for all Socony oil and chemical plants. By 1925, Socony maintained its own safety inspection department. By 1927, Vacuum Oil also maintained a separate safety and employee claims department. Throughout the 1930s, Magnolia oil maintained a safety and fire protection department under J. L. Risinger. Employees themselves soon took over publication of their own accident awareness and safety efforts. By the 1930s safety manuals were standard features in the *Magpetco*, the Magnolia Oil Co monthly refinery magazine. Refinery workers were provided with common safety equipment for the era including splinter-proof goggles, dust masks, machine guards, gas masks, and hazard warning signs.

The 1931 *Magnolia News* diffused the industry’s cultural association with extreme danger saying, “Throughout the refinery property evidences of safety work are apparent, suggesting to the stranger that it must be a very dangerous place to work. But we conclude otherwise when we learn that the equipment is for prevention.”

100 See also American Petroleum Institute, *Fire Protection in Refineries* (Baltimore: The Lord Baltimore Press, 1933), Trade Literature Collection, Hagley Museum and Library, Wilmington, Delaware.

101 These reports were cribbed from late-nineteenth century Standard Oil manuals. The General Petroleum Corporation of California developed insurance and medical liability policies for its employees as early as 1934. Socony-Vacuum maintained a workplace injury and death insurance and a retirement income plan for employees by the late 1930s. Manuals, Folder ‘Employee Information,’ Box 2.207/E220, Exxon Mobil Historical Collection, Briscoe Center for American History, University of Texas, Austin, Texas.


103 “Playing Safe and Keeping Well at Beaumont,” *Magnolia News*, October, 1931, 16, Box 2.207 E33, Briscoe Center for American History, Exxon Mobil Historical Collection, Briscoe Center for American History, University of Texas, Austin, Texas.
article went on to reinforce the importance of individual worker agency to the maintenance of safety standards, “Unlike many industrial health and safety plans which savor of paternalism, Magnolia’s program at the great Beaumont refinery is directed largely by the employees, although our company bears a large part of the cost.”

Appeals to individual autonomy became even more explicit during the war years as safety was incentivized. Companies began providing individual – sometimes monetary – awards for good safety records and pins for years of service with the company. The General Petroleum Company described a 1943, “policy of encouraging and protecting long service” that it had implemented for the previous ten years. The 1931 *Magnolia News*, distributed to its network of Beaumont refineries, also boasted that the safety department regularly tested heating tanks and stills for poisonous gases such as hydrogen sulfide.

The success of these programs was limited. It is unclear how many of these safety programs ever made it to refineries in the pro-business, virulently anti-union Permian Basin. Further, despite their utility for worker morale, these early efforts to balance unregulated individualism with corporate paternalism sidestepped the most fundamental

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104 Some oil companies did have established accident prevention plans, however equipment inspection was, as a rule, left up to company representatives. For example, the 1940 “Employee Handbook” for the General Petroleum Company based out of California included stipulations for two types of internal safety committees - one made up of management and the other of rank and file employees. “The Safety First Movement,” *Magnolia News*, February 1917, Box 2.207 E33, Exxon Mobil Historical Collection, Briscoe Center for American History, University of Texas, Austin, Texas.

risk associated with refinery production: the potential consequences of long-term exposure to chemicals and other hazardous materials. Before the 1970s, few of the chemicals produced at refineries and petrochemical plants were tested for their long-term impact on human health. Oil companies and oil workers knew that breathing in fumes or handling distillate liquids had potential immediate consequences. However, in the 1940s and 1950s the industry’s relative infancy meant that few people had worked long enough in the industry to develop chronic illnesses.\footnote{Evidence of some knowledge can be found in industry safety manuals and best practices handbooks. In the 1950s, Socony-Mobile developed detailed plans for refinery fire abatement as well as general regulations for boosting employee health and reducing time off the job. Safety Manuals, Folder, ‘Human Resources Employee Safety General 1909-1931, 1952-1992,’ Box 2.207/E39 and Safety Manuals, Folder ‘Human Resources Health Services 1926-1928, 1951-1984,’ Box 2.207/E40, EXXON Mobil Historical Collection, Briscoe Center for American History, University of Texas, Austin, Texas.}

The Odessa Petrochemical Plant had many long-term consequences. With the benefit of hindsight, data collected in the 1970s and 1980s from the Texas Commission for Environmental Quality (TCEQ), the Environmental Protection Agency (EPA) and the Texas Water Commission (TWC) revealed an array of health hazards for workers and for the surrounding community. The steam cracking process that separated natural gas into its component parts produced an incredible amount of air pollution. In particular, regular burn offs of waste products and steam pressure releases during the cracking process meant that chemicals were constantly being released into the air. Water used in the polymerization process was expelled into concrete tailing ponds, leaking chemicals into the soil and groundwater. Detailed records documenting groundwater or water contamination during the 1950s and 1960s do not exist. However, EPA recommendations published in the late 1970s make it clear that industry officials knew that refinery
contamination was immediately hazardous to workers and local residents. For example, as early as 1978 butadiene was known to be particularly toxic when airborne, considered worse than formaldehyde when ingested.  

A 1980 EPA investigation into the toxicity of styrene and ethylbenzine found that both could become easily vaporized and travel airborne long distances. Epidemiological studies linked styrene and ethylbenzine exposure to increased nervous system and reproductive disorders among chemical plant workers.

In an effort to counter unionization efforts and to avoid employee dissatisfaction with working conditions, El Paso Corp went to great lengths to shore-up its reputation with Odessa oil workers. El Paso used the national narrative of oil progress and local satisfaction at industry expansion to connect oil companies and the community in the minds of local oil workers. Building upon the local press’s sunny booster narrative of regional importance and sophistication through oil, El Paso used pageantry and civic displays to forge an undeniable connection between the Odessa plant, technological progress, and the city’s mostly white population of middle class oil workers. Beginning in the 1950s and continuing throughout the 1960s El Paso Corp. opened the Odessa Petrochemical Complex to educational tours, with local schools, the Odessa Study Club, the local women’s Desk and Derrick Club, and other organizations regularly visiting the

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plant to ostensibly learn about synthetic production. Not designed to actually teach viewers how to become proficient in the petrochemical industry, such tours reinforced awe at the plant’s size, complexity, and scientific sophistication even as they integrated the plant into the community processes of youth education and recreation. These tours were paired with an array of industry booster events such as the annual Odessa Oil Show, industry athletic competitions, and barbecue dinners.

El Paso Corp was indicative of broader trends. In the postwar period, oil companies worked hard to foster a “corporate family” atmosphere that bound oil employees to the industry through their community ties. At the same time, El Paso’s efforts tapped into a wider Cold War discourse in which oil companies sought to leverage a story of American technological triumph and ever increasing consumer abundance into public support for industry expansion. In the pages of such diverse documents as investor reports, company magazines, and direct-mail company propaganda, oil companies explained the difference between modern synthetic products and their inferior

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109 Desk and Derrick was a social and educational network for secretaries and office staff working in the oil industry. Overwhelmingly female, the organizations provided technical and scientific education for administrative employees. Former US president George H. W. Bush was a member of the Midland Desk and Derrick Club in the 1970s. *George Bush: The Life of a Lone Star Yankee* (New York: Transaction Publishers, 2010).
110 The Odessa Oil Show is an outdoor industry fair similar in personality to a state agricultural fair. The Oil Show began in 1940 as the “Little International Oil Show” and is still held every two years. Permian Basin International Oil Show, accessed June 7, 2017, http://www.pboilshow.org.
111 For example, the *TP Voice*, the company magazine for the Texas and Pacific Oil Company worked to create a family atmosphere, publishing family portraits, photographs of new babies, and high school graduation announcements. *TP Voice*, Texas and Pacific Oil Company, 1965-1976, Trade Literature Collection, Hagley Museum and Library, Wilmington, Delaware.
natural counterparts, focusing on petroleum as the creator of modern domestic bliss.\(^\text{113}\) A press release from the General Petroleum Company described industry expansion as the fulfillment of consumer desire, “The construction of this plant is an important example of the reality of the sound purpose of our private oil business – to do whatever is required to furnish an abundant supply of oil products to the people who use oil to make their lives more productive, more comfortable, more pleasant.”\(^\text{114}\) Similarly, in 1958 Esso, the international subsidiary of Standard Oil, sent out a series of direct mail ads proclaiming, “The better you live, the more oil you use…,” equating oil consumption with the maintenance of modern society.\(^\text{115}\) Well into the 1960s oil producers were joined by companies such as the Houston-based Union Carbide Co. and the Firestone Chemical Co. to fund a cottage industry of pamphlets, posters, books, and documents explaining the chemical origins of new synthetic products and their role in increasing the American standard of living.\(^\text{116}\) In this way a cyclical pattern emerged in which the industry’s ability to find, produce, and transport a seemingly inexhaustible supply of oil was explained as simply meeting an ever increasing demand for petroleum and petroleum products. Large oil companies in particular painted these efforts as a demonstration of their efficiency and


\(^{114}\) Clippings, Folder, ‘General Petroleum Corporation News Clippings, 1955-1990,’ Box 2.207/E214, Exxon Mobil Historical Collection, Biscoe Center for American History, University of Texas, Austin, Texas.

\(^{115}\) Advertisement, Esso Company, Box 7, Col 60, Rubber, Warshaw Collection, Smithsonian Archives Center, Washington, D.C..

\(^{116}\) Advertisements and Ephemera, Box 2, Collection 60, Chemicals, Warshaw Collection, Smithsonian Archives Center, Washington, D.C.
logistical ability, displaying their ability to manage oil production and transport without federal control.

In Odessa, well into the 1960s, such programs were reinforced through *Odessa American* coverage of the Odessa Oil Show which featured an array of detailed, technical op-ed pieces written by local industry leaders and engineers. Each year, this series of articles followed single products through the Odessa Plant’s assembly-line process and emphasized in exhaustive detail the array of uses for the plastics and rubbers produced at the plant. Reminiscent of Du Pont’s consumer-product-focused “Wonderful World of Chemistry” presentation at the 1964 World’s Fair or Disney’s “World of Tomorrow” exhibit which imagined life made easy through household gadgetry in a not-so-distant-future, such dialogue raised the stakes for chemical production in Odessa, connecting the daily labor of oil workers to the globalization of American industry and the expansion of twentieth-century automated technology.¹¹⁷

Throughout the 1950s and 1960s, such campaigns coincided with yearly records in total US oil consumption. Simultaneously, fenceline exposure to airborne and groundwater pollutants from refineries and chemical plants increased exponentially in oil communities throughout Texas. Despite the industry’s booster narratives, in West Texas economic prosperity was often not an assured tradeoff for contamination. As those working in the oil industry continued to increase their standard of living, ghettoized Latinx and black communities, excluded from the most lucrative industry jobs, benefited significantly less from infrastructural expansion. Instead, they often became the

¹¹⁷ For more on DuPont and Disney’s mid-century technological utopianism see Ruth Schwartz Cowan, *A Social History of American Technology* (Oxford University Press, 1997).
communities most immediately impacted by industrial pollution.\textsuperscript{118}

Oil companies had a similarly mixed impact as they expanded their global operations during this period. Texas oil companies negotiated with the Saudis and other oil-rich nations for access to massive oil discoveries in the Middle East. In negotiations with foreign governments and in domestic press releases, oil companies perpetuated a narrative that through the power of technology, they would be able to constantly expand oil production and thwart a finite resource supply. According to the API, oil’s expanding network of infrastructural and economic control – fueled by synthetics production – would help to solidify US geopolitical power and economic empire. Through films such as Sun Oil’s “Power through Progress” and “State of the Union,” as well as in industry periodicals such as Petroleum Refiner and TP Voice, as well as in newsreels, and daily periodicals, oil sold this narrative to employees, boosters, and the general public. For example, in 1951 industry advertising promoting the creation of the massive Tapline pipeline across the Middle East was described as bringing civilization to “primitive” people.\textsuperscript{119} Through international expansion, oil companies would bring education and infrastructure that would allow industrializing nations to finally reap the monetary rewards of their natural resources.\textsuperscript{120}

\textsuperscript{120} Such protestations were not isolated to oil, with industries from tire manufacturers to chemical producers using very similar rhetoric in their advertising and trade literature during the 1950s and 1960s. For example, see \textit{Petroleum Refiner: Oil Centennial Issue}, 1959, Trade Literature Collection, Hagley Museum and Library, Wilmington, Delaware.
Such discoveries required Texaco, ARAMCO and other companies to expanded oil infrastructures in even more inhospitable deserts. Compared to the Permian Basin, drilling was even deeper, water was scarcer, and climate was much hotter. With workers asked to complete oil exploration in even more extreme conditions, new drilling rigs, pipelines, and oil refineries fundamentally altered desert environments and compromised the health of both workers and (often nonwhite) residents near these operations. Further, while oil companies described this expansion as a tool for world peace, as scholars such as Robert Vitalis and Betsy Beasley have demonstrated, these oil companies also outsourced systems of racial hierarchy and unequal contamination from Texas and into deserts around the globe.121

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The 1950s and 1960s were a time of general expansion for the oil industry and for Permian Basin oil communities. During this time of rising prosperity, oil companies attempted to control the potential for unionization or industry strikes using a variety of strategies. These efforts were generally successful. Oil companies used massive propaganda efforts to thwart refinery unionization efforts throughout the late 1940s and into the 1960s. While unions called for better safety regulations, pensions, and higher wages, oil companies reminded workers that the company believed in individual autonomy and that the industry – not unions – were responsible for rising wages and increasing regional importance. These efforts were linked to general public opposition to a national refinery strike in 1952 and the oil industry’s ultimate victory in the conflicts

between Texas oil companies and federal regulators over access to offshore mineral rights in the Gulf of Mexico.¹²²

In the Permian Basin, industry propaganda equated oil production with community cohesion and development, generating widespread support for the industry and passionate opposition to labor organizing. In the Permian Basin, such propaganda was directed at both industry consumers and oil workers in all branches of the industry and was designed to inextricably link the oil industry to local civic pride. Plant tours, industry fairs, corporate philanthropy programs, news releases, and employee manuals all implied that oil industry stability was central to both economic strength and acceptable, respectable citizenship. More importantly, however, such campaigns argued that oil companies, as members of the community and bringers of vital new oil technologies, were the most qualified to lead Permian Basin development and manage the region’s natural resources. In the process, oil companies diverted attention away from the environmental and public health consequences of oil processing, with utopian faith in industry distracting many from both immediately visible workplace hazards and the industry’s long-term consequences.

Chapter 5

The Organization Man

The February 1950 edition of the *Magnolia News* chronicled the life of Lutellis Arthur Sherman, a driller for the Magnolia Oil Company. The article praised Sherman’s “loyalty to Magnolialand’s oil country” and articulated a perceived connection between Sherman’s many years in the industry, the region’s cowboy culture, and local nonhuman nature through a description of Sherman’s retirement plans. He planned to, “ride the range of his farm in Bee County, and perhaps raise a few head of cattle.”¹ Sherman’s desire to own cattle was understood as a natural result of his years in West Texas, “…once you’ve lived in the Southwest, there is no other place for you to call home.” A companion article described Malcolm McCullough Keeble, “who everybody knows as Mac,” district superintendent of Magnolia’s Kermit Producing District, “Though not a native of West Texas, he is now as much a part of it as sand storms, cattle and oil derricks. And, he likes it there like every loyal West Texan whether he be transplanted or an aboriginal inhabitant.”² Such affected connections between employees in growing multinational oil companies and the West Texas environment were common in industry publications during the second half of the twentieth century. As new developments in extraction and processing technology made the oil industry more efficient, more complex, and more destructive to local environments, oil companies worked to make themselves

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¹ “Men Who Make Magnolia,” *Magnolia News*, February 1950, 14-15, Box 2.207/E224, Exxon Mobil Historical Collection, Briscoe Center for American History, University of Texas, Austin, Texas.
² Ibid.
inextricable from both the region’s constructed past and imagined future.

Despite constant fluctuations in oil prices, in the decades between the end of World War II and the oil shocks of the early 1970s, Permian Basin oil profits continued to balloon due to steady regional advances in oil extraction, transport, and processing technology. Ever-increasing extraction brought a massive influx of capital to the Permian Basin, reshaping the region’s urban environments to match the industry’s lofty booster rhetoric of oil as a civilizing force and driver of the future. New refineries and oil processing operations increased community wealth and employment stability. Newly settled oil workers bought property in towns and cities that were quickly expanding. Skyscrapers housed office space for a new army of white-collar oil personnel in downtown Midland. Suburban developments fanned out around Midland and Odessa and populations increased in San Angelo, Big Spring, and other oil towns.

As easy-to-access oil was slowly depleted and drilling became more expensive, the number of small companies declined and large multinationals took over most drilling operations. These multinational oil corporations, led by engineer “company men,” manipulated land, politics, and the regional economy in increasingly invasive ways, hoping to stave off inevitable oil depletion and continue the region’s massive, unprecedented urbanization. New, more exact extraction and well maintenance technologies, especially directional drilling and secondary recovery processes such as oxygen and water injection, were very expensive and logistically complex. Engineers and other industry experts advised oil companies and landholders to pool regional oil reserves into large “unitized” zones to slow resource depletion. Unitized fields were almost always managed by a single, large oil company. By the 1960s, with both oil prices and
allowable extraction rates far lower than a decade earlier, only the largest oil companies
could afford to continue operations. This sped up industry consolidation which would
continue throughout the 1970s.

Despite eroding local control, the rapidly changing built environment made
increasing regional wealth starkly visible and reinforced the industry booster narrative of
constant progress through development. Protestations by engineers and Permian Basin
elites that oil had brought order and control to dirty, dangerous, and lawless desert
communities were reinforced by oil extraction technologies that allowed engineers to
more accurately predict subsurface geology and regulate the rates of oil extraction. Such
technologies indicated to many people inside and outside the industry that oil had tamed
both land and its dangerous inhabitants, making the oil business safe, predictable, and
self-regulating. Some landowners and small producers chafed under large company
control and oil workers resented the increasing lack of autonomy brought by automation
and further industry professionalization. Writing in the early 1970s, Folklorist Moody
Boatwright lamented the decline of earlier, less regimented oil work, “As the industry
matured the organization man took over. Management is now dominated by conservative
businessmen, whose risks are carefully calculated; and drillers and roughnecks live in
comfortable towns and suburbs and differ little from their neighbors.” However, the
popular belief that more efficient detection and extraction technologies offered the best
solution for oil depletion and a pragmatic desire for continued profit made both oil
employees and landholders complicit in regional destruction.

3 Boatwright, *Tales from the Derrick Floor*, 121.
4 Ibid.
Industry efforts at comprehensive control over the natural world were incomplete at best and damage to regional ecologies and public health was increasingly noticeable. Unavoidable oil depletion, drought, and continued water scarcity were exacerbated by “solutions” to the depletion problem that only created new troubles. Widespread experimentation and innovation in oil detection and well injection technologies made it impossible to avoid the fact that oil supplies were finite and that, increasingly, oil was harder to access. Efforts to avoid oilfield depletion made extraction more efficient, but they also depleted the region’s precious groundwater supply and caused water shortages in the region’s growing urban centers. The few environmental records that exist from this period show that oil processing and transport increased industry contamination near population centers, especially Midland and Odessa. In Odessa, expansion efforts at the Odessa Petrochemical Plant poisoned the air and contaminated surrounding groundwater. In Midland, the convergence of eleven pipelines just east of the city center made residents susceptible to water contamination, gas leaks, and pipeline explosions.

However, for many people in the industry these consequences either went unnoticed or were deemed acceptable collateral damage. Residents and oil boosters continued to understand waste and contamination as two separate issues. Resource waste was a deadly-serious economic problem that needed to be dealt with through more efficient technologies. Evidence of contamination, however, could be largely ignored. Reflecting the region’s history of segregation, in both cities hazards from unregulated dumping, burnoffs, and accidents were largely born by nonwhite and low-income populations. While some workers and landholders shared Boatwright’s ambivalence toward industry automation, elite dismissal of black and Latinx communities allowed
many in the industry to simultaneously dismiss the increasing impact of industry contamination. With such a myopic view, community leaders and oil company managers saw new oil technologies and industry consolidation as ways to shield the region from further risk – as the best available solution to thwart the region’s lack of water, history of lawlessness, unmitigated oil depletion, and economic irrelevance.

In this way, during the 1950s and 1960s the Permian Basin remained a plundered space, with its low population and lack of beauty making it easy to exploit land and local ecology in the name of profit. The region’s urban spaces were sites of such exploitation. Scholars have remarked upon changing urban environments in postwar America. The expansion of suburbs and the flight of white elites from city centers exacerbated race-based economic inequality and eroded the efforts of civil rights activists. Others have connected Cold War anti-communism to the US postwar advertising rhetoric of progress through industry and technological utopianism. In this context, fifty years of conflict with nature, a cultural of temporary hardship in the pursuit of profit, a public booster rhetoric that placed heavy faith in technology, and entrenched workplace and residential segregation narrowed the options that industry employees had as they sought Permian Basin prosperity and imagined the region’s future.

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After World War II, the federal government lifted sales restrictions on gasoline and rubber and Americans bought cars in record numbers. The demand for oil increased.

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exponentially, fueling new exploratory drilling in Texas, California, and Oklahoma.

Although average oil prices hovered around only $2.51 per barrel for most of the 1950s, the increased demand for gasoline, synthetic rubber, and new plastics made extraction highly profitable.\(^7\) During this period, average Permian Basin wages increased, extraction and processing efforts expanded, and regional employment consistently hit 95 percent.\(^8\) Prosperity contracted somewhat in the 1960s as foreign oil production increased and oil prices dropped. While this resulted in a dip in wages and population decline, such regression was relative. Oil kept average employee pay well above other Texas oil producing regions for the duration of the 1960s slump.\(^9\) Throughout this period of boom and bust, the oil industry continued to influence the development of Midland, Odessa, the cities’ exurban communities, and the surrounding Permian Basin. Cities grew, new homes were built, and regional residents became increasingly conspicuous consumers and ardent Cold Warriors.

The most significant oil discovery during this period was the Spraberry-Dean Sandstone Field. While the majority of the field’s oil deposits were in Midland County,

\(^7\) American Petroleum Institute, *API Facts and Figures*, Collection 711, Box 116, API Photo and Film Collection, Smithsonian Archives Center, Washington, D.C..
\(^9\) In 1965, Midland County boasted the second highest wages state-wide. “Texas Oil Data, 1965,” Box 2E200, Mid Continent Oil and Gas Association Records, Briscoe Center for American History, University of Texas, Austin, Texas.
the Sprayberry-Dean encompassed a connected series of oil deposits stretching southeast from Andrews County on the New Mexico border to the northern edge of Crocket County.\textsuperscript{10} Paralleling the 1920s boom, as early as 1944 most regional oil drillers and surveyors knew that the Sprayberry-Dean contained significant oil deposits.\textsuperscript{11} However, the region’s tightly packed subsurface sand made drilling slow and expensive.\textsuperscript{12} In 1948 Magnolia, Humble, Tex-Harvey, and other oil companies made new oil discoveries in West Texas and New Mexico, including discoveries in the Sprayberry Field. While these initial wells did not produce much oil, in 1950 and 1951 Humble Oil, the Republic Natural Gas Company, and an array of small producers hit large oil deposits in Midland, Reagan, and Upton counties. This began a boom that would last, with some interruptions, throughout the 1950s. Speculative drilling would continue in the Spraberry-Dean through the next two decades. In 1965 Andrews, Ector, and Reagan Counties led the state in total feet drilled.\textsuperscript{13} By the 1990s, this single field would produce approximately 924.4 million barrels of oil.

Oil in the Spraberry-Dean Field was deep underground. Average well depth ranged from 5,100 to 8,300 feet. By comparison, between 1955 and 1960 average US


\textsuperscript{12} This sand allows for approximately fifteen percent of the oil trapped within it to be extracted using traditional drilling methods. Brantly, \textit{History of Oil Well Drilling}.

\textsuperscript{13} “Texas Oil Data, 1965,” Box 2E200, Mid Continent Oil and Gas Association Records, Briscoe Center for American History, University of Texas, Austin, Texas.
well depth came only to 4,236 feet.\textsuperscript{14} As a result, drilling costs in the Spraberry-Dean were high, on average $125,000 per well, or twice the national average.\textsuperscript{15} With oil prices low and overhead high, only larger independents and Major oil companies could afford to take advantage of these new discoveries, leaving smaller operations struggling. However, the new boom helped the Permian Basin reach global industry significance. During the 1950s the Permian Basin led the world in total feet of speculative drilling per year.\textsuperscript{16} In 1958 over 40 percent of all Texas oil production came from the Permian Basin.\textsuperscript{17} That year, the region ranked second in total US oil production and third in the world.\textsuperscript{18} These trends would continue until the early 1980s.

This jump to extractive prominence was made possible by new technologies that made deep drilling more precise: the refinement of the gyroscope, which helped determine the direction and angle of the drill within a hole; the torsion balance, which deduced the shape of concealed structures by measuring variations in the Earth’s gravitational force; the seismograph, which differentiated between types of subsurface rock using vibrational data; and the magnetometer, which detected the presence of oil using the Earth’s magnetic fields. Together, these tools drastically improved the industry’s ability to map subsurface geology and predict the location and size of oil deposits. While rudimentary down-hole testing equipment existed since the 1920s, most

\textsuperscript{14} American Petroleum Institute, \textit{API Facts and Figures 1959-1967}, Collection 711, Box 116, API Photo and Film Collection, Smithsonian Archives Center, Washington, D.C..
\textsuperscript{15} In 1955, nation-wide average per-well drilling costs were $65,500. American Petroleum Institute, \textit{API Facts and Figures 1959-1967}, Box 116, API Photo and Film Collection, Smithsonian Archives Center, Washington, D.C..
\textsuperscript{17} \textit{World Oil}, XLIV, 7 (1957), 120.
\textsuperscript{18} \textit{The Oil and Gas Journal}, LV, 4 (1957), 165.
geologists used aboveground visual cues to predict where oil was most likely to appear in rock strata. It was common industry knowledge well before 1935 that oil was most often found buried within sedimentary rock formations such as shale, sandstone, and limestone. The different characteristics of these rock formations were well articulated in industry journals. For example, an API and US Bureau of Mines report from 1929 described:

The sedimentary rocks are commonly arranged in more or less distinct layers or strata caused by the sorting action of waves and currents and by differences in the nature of materials supplied to the sea at various times. Shale and limestone are relatively compact and impervious, while sandstone is porous and capable of holding a considerable percentage of fluids [oil].

However, before World War II oil discovery and the process of drilling still relied heavily on the human senses for identification and discovery of oil producing rock formations. This had many limitations. Because drillers could not see inside the hole, evidence of an oil strike was either assessed through visual examination of mud brought up during drilling or the sudden onset of a gusher. Because it was impossible to know if the drill pipe was vertical within the ground, oil drilling efforts could go wildly off course. Referencing this phenomenon, a pamphlet from the oil tools developer Sperry Sun described that until 1946 oil drilling more an “art” than a science.

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19 Frehner, *Finding Oil*.
21 According to Sperry Sun, the biggest problem in the twentieth century oil industry was bad surveying techniques. Most drillers assumed they were drilling straight down, when in fact most holes were strongly slanted. J. N. Pew of Sun Oil financed further research into the development of an instrument to measure the position and inclination of bore hole. By 1947 this technology was developed into the gyroscope and became a mainstay of the postwar industry, making Sperry an important oil tools manufacturer. Over the course of the twentieth century, the introduction of the gyroscope and the introduction of
New technologies that did not rely on human senses for either oil detection or oil drilling precision were the subject of extensive postwar research. Sperry Sun, Hughes Tool, and other companies developed new directional technologies that helped operators pinpoint the exact angle and depth of the oil drill. The new discipline of geophysics pioneered the use of magnetic fields, seismic vibrations, radioactivity, and other properties of rock and sand to predict whether or not oil was likely to be nearby. Oil companies invested heavily in geophysical research and development, either forming their own research and development laboratories or rewarding independent patent holders for new discoveries.

In the postwar era, oil scientists perfected the magnetometer and the seismograph for industry use. These technologies offered new ways to test for the presence of oil without the need to drill an expensive hole. The magnetometer was a tool to measure directional drilling greatly increased the accuracy of drilling operations and the amount of oil extracted. Advertisements, Folder ‘Sperry Sun,’ Trade Literature Collection, Smithsonian Archives Center, Washington, D.C.; F. H. Lahee letters to J. N. Pew, Folder, ‘Dallas, Texas, J. Edgar Pew 1924,’ Box 119, Series 1F Administrative Interoffice (Geographical), Sun Oil Company Records, Hagley Museum and Library, Wilmington, Delaware.

22 Although Gulf Oil improved upon the technology, the first magnetometer was developed in 1834 by Carl Friedrich Gauss of Germany as a replacement for the compass. “Land Men Follow Geologists’ Trail,” Folder ‘General Petroleum Corporation Reference Compilation Folder 2 1950-1954,’ Box 2.207/E215, EXXON Mobil Historical Collection, Briscoe Center for American History, University of Texas, Austin, Texas.

23 This is not to say that oil companies would hesitate to infringe on these patents. For example, Serge Sherbatskoy spent the majority of the 1980s suing EXXON for patent infringement on his well logging technology. Correspondence, Box 20, Col 936 Serge Sherbatskoy Papers, Smithsonian Archives Center, Washington, D.C.

24 The earliest seismograph technology was developed by Ludger Mintrop in Germany in 1914. Although now heavily associated with earthquake research, the technology was initially developed to chart the location of salt domes, which signaled the presence of oil. During the 1910s several American companies worked to patent similar technology. “Seismic Operations,” Photographs, Box 40, API Photo and Film Collection, Collection
changes in the earth’s magnetic fields. An electrical current was passed through two coils, wrapped around an iron core. As the alternating current passed through the first coil, the iron core became magnetized and an electrical current developed in the second coil. Detected differences between the strength of the two electrical currents represented the strength of external magnetic fields. Because electrical signals – and magnetic fields – were intensified by the presence of oil, a magnetometer could be used to identify significant oil deposits. The development of the magnetometer considerably increased both accuracy and precision in oil surveying. In 1939, Gulf Oil developed a magnetometer that could be operated from a moving aircraft. The US Navy further developed this technology during World War II and in the 1950s it became a common tool of oil discovery.

In the early 1930s, John Clarence Karcher and Eugene McDermott founded Geophysical Services Inc. to develop seismograph technology. Karcher had perfected his reflection seismograph a decade earlier while working for Amarada Petroleum. This device operated by detecting the time between seismic waves running underground. The geologist used dynamite to set off an underground explosion and the seismograph machine measured changes to the pattern of vibrations as they moved through the earth. In 1930, after leaving Amarada, Geophysical Services Inc. received financial backing from prominent geologist Everett DeGolyer. Karcher and McDermott patented seismograph technology and quickly commercialized the technology.

711 and Patents, Box 1, Serge Scherbatskoy Papers, Col 936, Smithsonian Archives Center, Washington, D.C..

A scientist and financial backer for many advances in geophysics, DeGolyer went on to fund the development of radiodetective technologies, founding Isotopes, Incorporated in 1956. Degolyer competed with Serge Sherbatskoy, a Tulsa, Oklahoma engineer, who had begun research into radioactive oil detection methods a decade earlier. In the 1940s, Sherbatskoy patented a process of well logging that measured the radioactivity of subsurface rocks. Based on the principle that oil reflects the radioactivity of surrounding rock formations, testing for specific levels of radioactivity allowed the driller to identify the particular types of rock that were more likely to be found near oil deposits. Along with Scherbatskoy and DeGoyler, during the 1950s and 1960s many independent geophysical and oil technology companies sprang up in Tulsa, Houston, and Dallas.26

The spread of these technologies after World War II heightened the importance of credentialed scientists and college educated engineers to the processes of oil exploration. The early history of geophysics is dominated independent scientists, most of whom contracted out their services and their technologies to large oil companies for a hefty fee. In other cases, large oil tools producers negotiated with inventors for exclusive patent rights.27 On a typical job, engineers from Geophysical Services, Sperry Sun, Schlumberger, and others would arrive with their equipment at a designated well site on a designated day. These engineers would conduct their tests, providing the results to the

26 Myres, *The Permian Basin*.
27 For example, Sherbatskoy contracted with many of the prominent oil drilling companies in the US. He filed a series of patents for his “radiation detection service” in 1955, 1958, and for similar technologies in 1957 and 1961. Patents, Box 8, Serge Scherbatskoy Papers, Col 936, Smithsonian Archives Center, Washington, D.C..
head driller along with advice for successful oil exploration.\textsuperscript{28}

Because the monotonous Permian Basin landscape had few surface indicators of oil, new technologies were increasingly vital to successful oil exploration. With well pressure low in established fields and unusually high drilling costs in the Sprayberry-Dean, even if the funds were unavailable, oil producers quickly seized any opportunity to reduce the element of chance in their operations. As a result, the region was a site for the early adaptation and refinement of these new technologies. For example, the seismograph was first used in the Permian Basin as early as the 1930s.\textsuperscript{29}

Permian Basin hiring trends reflected a national push towards engineer freelancing. In the 1948 \textit{Permian Basin Oil Directory}, most oil companies engaged in exploration list their own geologists on staff.\textsuperscript{30} Larger oil companies list several. By 1955 this trend had reversed itself. The \textit{Midland City Directory} recorded 74 independent geologists, and 5 geophysicists, including a branch office for Karcher and McDermot’s Geophysical Services Inc. and a company called Uranium Headquarters that presumably specialized in radiodetective technologies.\textsuperscript{31} The increasing ubiquity of such consultants demonstrate the growing importance of the sciences in the Permian Basin oil industry.

The career of Calvin Johnston “Red” Davidson spanned this period and

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\textsuperscript{29} In contrast, taking seismograph readings before any exploratory oil operation only became standard industry-wide in the 1960s. \textit{Shear Wave Test Team – Lubbock, TX 1979}, Box 40, API Photo and Film Collection, Collection 711, Smithsonian Archives Center, Washington, D.C.
\textsuperscript{30} In the 1948 Permian Basin Oil Directory the Stanolind Oil and Gas Exploration Department lists fourteen, Gulf Oil lists twelve, Magnolia nine. \textit{Permian Basin Oil Directory 1948} (Midland: Burmass Sales Co, 1948).
\end{flushright}
demonstrates the daily experience of using ever-changing oil technologies. Davidson owned and operated the Davidson Drilling Company with his brother H. W. Davidson out of Odessa, Texas between 1925 and 1970. Davidson’s earliest notes from 1935 are kept in hand written, leather-bound “well logs.” Very similar to log books written in the 1920s and late-nineteenth century, these logs listed approximate well depth, the amount of water used, and the consistency and probable geological composition of the mud being ejected from the hole. Such assessments were made using visual cues along with rock smell, texture, and taste. Over time, these logs become more detailed, including sections to indicate the type of well injection and surveying systems used, details on the well pipe, and notes about drill bits and other machinery. By the 1960s, Davidson’s drilling notes appeared on computer printouts. These later reports included statements from seismograph contractors, chemists, and geologists, as well as detailed well spacing maps, and reports from other predictive equipment. All were carbon copied in triplicate.

New predictive technologies generated a great deal of paper. Well logs for a single drilling project easily spanned hundreds of pages. Seismograph readings, magnetometer reports, topographic maps, well location and oil lease maps, and aerial photography were combined with other documents such as lease agreements, stock certificates, oil price charts and probate court documents. Determining the presence of oil, and the ability to

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32 “Well Completion Records,” Box 83-021 Box 1, C. J. Red Davidson Collection, Permian Basin Petroleum Museum, Midland, Texas.
33 Drilling Reports, Folder ‘Drilling Records,’ Box 2.207/H6, Exxon Mobil Historical Collection, Briscoe Center for American History, University of Texas, Austin, Texas.; Reports, Folder ‘Well Completion Records,’ Box 83-021, Box 1, C. J. Red Davidson Collection, Permian Basin Petroleum Museum, Midland Texas.
drill directly to that oil, was more certain than ever before. Detailed legal records and exact surveying methods created new forms of control as property lines and lease agreements could be more exactly enforced. Together, these documents increased knowledge of the land both above and below ground.\textsuperscript{35}

Such changes marked a growing rift within the industry, with geologists and other credentialed professionals replacing drillers and tool pushers at the top of the industry hierarchy. According to James S. Hudnall, “In the early days the geologist was not looked upon as being much more than a doodlebug. His guess was just a little better than the operator’s but the operator usually would not admit it.”\textsuperscript{36} In contrast, by 1960 industry publications singled out geologist’s expertise and precision. \textit{Texas Monthly} proudly exclaimed that by the 1960s geologists had completely mapped the Spraberry trend and other large oilfields in the Permian Basin.\textsuperscript{37} Oil industry advertising told a similar story. An ad in the 1959 \textit{Oil and Gas Journal} spouted typical booster rhetoric, “Hunches, surface seepages, and the divining rod have yielded to scientifically precise methods of exploration. Drilling nowadays is an operation that can be as carefully controlled, almost, as the construction of a building.”\textsuperscript{38} Industry recruiters touted the array of new technologies used by geologists and engineers even as they emphasized the rugged, outdoorsy nature of the job.\textsuperscript{39}

\textsuperscript{35} “Geophysical Party,” Folder ‘General Petroleum Corporation Reference Compilation Folder 2 1950-1954,’ Box 2.207/E215, EXXON Mobil Historical Collection, Briscoe Center for American History, University of Texas, Austin, Texas.
\textsuperscript{36} Boatwright, \textit{Tales from the Derrick Floor}, 229.
\textsuperscript{37} Skip Hollandsworth, “That’s Oil Folks!,” \textit{Texas Monthly}, September 2010.
\textsuperscript{38} \textit{Oil and Gas Journal: Golden Anniversary}, 90.
\textsuperscript{39} Employee Manuals, Folder ‘Corporate: Administration: Human Resources: Employee Recruitment Socony/Socony-Vacuum 1920s-1950s,’ Box 2.207/E35, EXXON Mobil
In order to develop these technologies and predict the presence of oil, geologists and geophysicist had to understand and predict the broad natural processes that produced oil – the millennia-long natural history of the Earth; the processes of dead plant matter becoming trapped beneath the ground and slowly transformed under extreme pressure into oil; as well as the physics behind the movement of liquids underground under extremely high pressures. Engineers predicted drill and oil tool failure due to extreme heat and pressure. With oil companies funding the types of questions asked about the subsurface world, geological and geophysical research was focused on issues and discoveries related to efficient extraction. Simultaneously, this increase in specialized knowledge significantly decreased the number of people who had access to full understanding of the subsurface world. Increasingly, authority to direct the path of exploratory operations was given to credentialed scientist who interpreted abstract data for oil drillers and oil companies.

Machinists, foremen, roughnecks, and day laborers were even further removed from this broader geological knowledge community than drillers or tool pushers. These workers increasingly experienced oil discovery through the seismograph’s gyrating line on the printed page, color-coded sections on a topo map, or moving gauges on top of “Christmas trees” – the name given to the system of valves and pipes used to regulate well pressure in a producing well. These new technologies made oil production more predictable, transforming oil from an anthropomorphized adversary into a set of numbers describing well pressure, oil-gas ratio, well depth, and other factors. Wells did not gush

Historical Collection, Briscoe Center for American History, University of Texas, Austin, Texas.
40 For context see Frehner, *Finding Oil*. 
uncontrollably and excess natural gas was not burned off into the atmosphere in a wall of flame. Whatever their tangible utility, the human senses were no longer the final word in oil discovery. Oil exploration was still dangerous, dirty work. It was still the most capital intensive and most speculative part of the oil economy. However, new technologies reduced employee autonomy and authority. Workplace seniority and experience with the region was less important than technical expertise.41

While these new oil technologies did not increase worker prestige or raise most small oil companies to Major status, they did help to increase regional oil wealth and make many formerly itinerate oil workers into settled homeowners. Many regional workers invested in large suburban homes, multiple automobiles, and other amenities. In the popular press, both the increase in exploratory drilling and new urban development projects were described using a language of respectability, praise for increased control over nature, and hope for future prosperity through technological expansion. As the industry grew, the city of Midland was the administrative center of this technological and administrative web.

The region’s two largest oil cities, Odessa and Midland, expanded rapidly during the 1950s. Suburban expansion and business construction reinforced the two cities’ separate trajectories and exacerbated a regional rivalry. Already a center for oil administration, Midland grew increasingly white collar and Odessa, which housed the El Paso Natural Gas Corp’s 700-acre Petrochemical Complex, became increasingly industrial. Political rhetoric in both cities was dominated by a narrative of progress.

through expanding oil technology. However, Midland fashioned itself as a “new Dallas” – cosmopolitan, urbane, and in control – while Odessa reinforced kinship with the region’s rough-and-tumble cattle ranching roots. In a June 1975 interview with Texas Monthly, Odessa trial lawyer Warren Burnett looked back on these trends, “A long time ago, Midland decided to take the high road. That’s why the law offices over there have drapes and deep rugs and everybody talks in hushed tones. Odessa, on the other hand, has little demand for corporate lawyers. We are a bunch of sweat-hog lawyers over here, getting it on in the courtrooms. We tend to drink in bars. Midland lawyers drink at home.”

This rivalry inflected both city development efforts in the 1950s, municipal responses to the 1960s downturn, and official reactions to environmental contamination.

Midland’s postwar economy was less diversified than Odessa’s, making the city at once more susceptible to boom and bust fluctuations and also readier to profit from sudden industrial expansion. During the 1950s, Midland not only offered higher paying, more prestigious jobs, but the city was generally wealthier than Odessa. According to a 1957 interview with the manager of the Texas Employment Commission, more than half of Midland’s workforce was employed either directly in oil or in adjacent industries. In contrast, only 35 percent of Odessa’s labor force was engaged directly in oil production.

When times were good, this singular focus made Midland very wealthy. In 1949, the median Midland family income was $4,200 ($42,988.76 in 2017 dollars). By 1959

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43 Manager, Texas Employment Commission, Midland, April 15, 1957 in “A Comparison of Two Oil City Business Centers (Odessa-Midland, Texas)” Dickinson Weber (Dissertation: University of Chicago, 1958), 35.
median family income had risen to $7,100 ($59,435.87 in 2017 dollars), significantly higher than any other city in Texas.\textsuperscript{44} In 1965 Midland had the highest per-household consumer income in the state at over $8,000 ($61,867.43 in 2017 dollars).\textsuperscript{45} In contrast, the median income in Odessa rose much more slowly between 1950 and 1960.

Midland’s reputation as oil’s administrative center sent oil companies flocking to the city, with many companies setting up new offices and others upgrading their Midland branch offices into district headquarters. This resulted in a sharp increase in the city’s college-educated, white collar population.\textsuperscript{46} According to the \textit{New Handbook of Texas}, by 1950 approximately 250 oil companies maintained offices in Midland.\textsuperscript{47} The 1955 \textit{Midland City Directory} listed approximately 370 oil production and shipping companies. By 1959, this number had reached more than 650.\textsuperscript{48} Workers in these new offices included secretaries, engineers, surveyors, geologists, salesmen, and industry management. According to a 1959 Princeton University report, “Case Studies in Racially Mixed Housing,” the number of professional administrative and clerical workers in Midland increased during the 1950s at a rate 50 percent greater than craftsmen, machine

\textsuperscript{45} \textit{TP Voice}, Texas and Pacific Oil Company, July-August 1965, 4, Trade Literature Collection, Hagley Museum and Library, Wilmington, Delaware.
\textsuperscript{46} In 1965, Midland residents completed on average 12.5 years of formal education. \textit{TP Voice}, Texas and Pacific Oil Company, July-August 1965, 4, Trade Literature Collection, Hagley Museum and Library, Wilmington, Delaware.
\textsuperscript{47} Ron Tyler, ed., \textit{The New Handbook of Texas}, Vol. 4 (Houston: Texas State Historical Society), 706-710.
operators and laborers. In contrast, workers in these other categories declined from one third of the total workforce to one forth by 1960.\textsuperscript{49} The \textit{1955 Midland City Directory} listed ten petroleum engineers available for contract, thirteen oil exploration contractors, and 39 oilfield services companies.\textsuperscript{50}

Regional control over the processes of oil extraction mirrored increasing order within the Midland city limits. During the 1950s, the need for office space sparked a city-wide commercial building boom. Before World War II, Midland’s largest buildings dated from the 1920s boom and included the twelve-floor Hogan Petroleum Building, built in 1928 and named after local lawyer and oil entrepreneur Thomas Stephen Hogan, as well as several large hotels. By the late 1950s, even though the city’s population remained below 60,000, Midland housed eight skyscrapers and over two million square feet of office space.\textsuperscript{51} These numbers continued to increase throughout the 1960s. In contrast, of other West Texas cities, only Lubbock and Abilene supported a single building above 15 stories.\textsuperscript{52}

Local rancher Jack B. Wilkinson began speculating in Midland residential construction in the early 1950s. He branched out into commercial construction later in the decade. Wilkinson built three of the tallest buildings in the city, the six-story Wilkinson Foster Building, the fourteen-story V & J Tower, and the twenty-two story

Wilco Building. Wilkinson’s projects joined the Petroleum Life Building, the First National Bank Building built in 1952, and the ten-story Midland Tower built in 1948. By 1960 Wilkinson owned one-third of all office space in the city. Wilkinson did not see this construction boom as excessive, “Pretty soon Midland was the headquarters of the independent oil man in Texas. During the 50s almost every square foot of space was rented, so we built more offices. People said we were over-building, but that wasn’t the case. Almost every building made money for its investors. It was hard to go wrong in Midland.” For a time, Wilkinson was proven correct. By 1955 this cluster of massive structures was home to the majority of the city’s geologists and the region’s large oil companies.

The creation of this large, vertically-oriented downtown significantly changed the city’s skyline. Such construction intentionally demonstrated the oil industry’s importance to Midland and, by extension, Midland’s importance to the regional economy. The city was the industry hub from which important business deals were made, extraction quotas were set, and where scientists, engineers, and surveyors delivered their reports. The July-August 1965 issue of TP Voice magazine described Midland as the “Capital of the Permian Basin” and boasted that the city housed the “tallest building between Fort Worth and Los Angeles.” Demonstrating the city’s dominance and the region’s

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characteristically flat, treeless terrain, according to the Texas State Historical Association, by 1955 Midland’s city center could be seen for “thirty miles in any direction.” The Midland Chamber of Commerce, oil companies, and the regional press often used this anecdote in promotional materials to demonstrate the city’s growing sophistication and regional importance. As early as 1947 and throughout the 1950s at least one Midland baseball team was named the Skyscrapers.

Reinforcing this growing sense of self-importance, Midland’s population grew three hundred percent between 1950 and 1960. National oil companies sent representatives and management personnel to staff their newly expanded offices. Rural farmworkers and ranchers, fed up with low wages and renewed drought, once again migrated to the oil fields to take advantage of high wages and guaranteed employment. This time, however, a newly constructed network of regional roads and the postwar ubiquity of car ownership made it possible for oil drillers and well service personnel to live in town and commute to drilling sites.

The Midland city government attempted to regulate growth, developing a “Midland City Plan, 1950,” which emphasized “charm and individuality” as well as the quick expansion of residential subdivisions for the city’s swelling population. The Midland Chamber of Commerce advertised the city’s infrastructural amenities heavily.

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The Midland Memorial Hospital and public recreation area Hogan Park opened to much fanfare in 1950. Between 1950 and 1960, the Midland School District built twelve elementary schools, three junior high schools, a new junior/senior high school and fourteen other school buildings to accommodate a student population that expanded from 25,000 to approximately 60,000 by 1960. These expansions more than doubled the capacity of the school district.

Midland oil workers used their new affluence to achieve the postwar American suburban dream. Initially, most freshly arrived oil workers in Odessa, Midland, and other oil towns lived in trailers, campers and hotels. However, postwar innovations in prefabricated housing, cheap land, and a regional building boom meant that the influx of middle-to-low-income oil workers in desperate need of cheap residential housing were quickly able to afford their own single family homes. In Midland, contractors responded to the rising population by building hundreds of small, two bedroom houses that sold for $8,000 to $12,000 – priced strategically at what an average blue collar oilfield worker could afford.

Wealthier industry employees, such as engineers, geologists, and surveyors, also bought new homes during this period. During the mid-1950s, wealthy families increasingly built custom homes on the city’s west side. Reflecting midcentury trends in suburban development, these neighborhoods had winding, park-like streets and the homes boasted amenities such as two-car garages, air conditioning, wall-to-wall carpeting,

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draperies, and yard fencing. A dip in oil prices meant a slowdown in population growth in 1955 and 1956. But local contractors continued to build new homes, especially larger three bedroom homes on the city’s west side. With the population stagnant, residential prices dropped in the late 1950s. This led to a wave of home buying. Many middle-income families took the opportunity to upgrade into even larger homes. This trend peaked in 1959 as 43 percent of Midland’s population moved into new accommodations.

The Midland Chamber of Commerce and industry boosters linked such suburban construction to the city’s growing gentility and sophistication. They heavily publicized the construction of “respectable” community amenities. In 1953, the Midland Symphony

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64 Ibid.
Orchestra was founded. In 1956, Midland County began construction on a two-story city library. The Midland Community Theater built a new playhouse in 1958. The Midland Central YMCA opened its doors in 1959. Other city construction was heavily publicized as demonstrating the city’s measured, ordered growth and increasing good taste. Between 1955 and 1960 the number of churches listed in the Midland City directory increased from 57 to 82.

Midland elites placed their growing wealth and respectability in contrast to Odessa’s more industrial reputation. While region-wide reports of violent crime and public drunkenness were significantly fewer than they had been thirty years earlier, Midland did have more promising statistics than Odessa. In Odessa, the growth of the Odessa Petrochemical Complex, new suburban development on the city’s east side, and increasing oil tool manufacturing operations were understood as markers of technological sophistication and industry importance. However, editorials in the *Midland Reporter* and in reports from the Midland Chamber of Commerce demonstrated a belief that the real power in the region rested with the money and bureaucratic administration in Midland.

Just as the Petrochemical Plant became a site for Odessa tourism, Midland’s growing downtown center was the place to bring visitors. The *Odessa American* regularly ran articles on the competition between the two cities, discussing regional economic control in terms of geographic expansion efforts. In 1948, an Odessa economic expansion committee proudly boasted, “Midland will be suburb of Odessa, says 100

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65 Weber, “A Comparison of Two Oil City Business Centers.”
Committee."68 In a 1950 article discussing the residential construction boom in Odessa, the newspaper exclaimed, “The city of Midland also set a new all-time high, but its figure did not reach Odessa’s.”69 Residents, politicians, and industry administrators connected oil industry expansion to the spread of culture and order to the region. Ownership of increasingly large, detached family homes allowed oil workers control over their own small piece of local geography. At the same time, imposing new office buildings, bourgeois entertainment venues, and secluded suburbs demonstrate to anyone looking that oil was king and that Midland’s oil elites were in charge of the industry’s future.

Unfortunately for residents in both cities, this prosperity and expansion was neither universal nor continuous. The mid-1950s marked a trend toward industry consolidation as rising drilling costs and increases in global oil supply kept domestic crude prices low. New quotas set by federal regulators and the Texas Railroad Commission to preserve domestic oil reserves kept production levels well below maximum potential.70 Small oil companies, hard-pressed to compete with the increasingly high-tech Majors, felt the squeeze and the regional industry experienced a wave of mergers and buyouts that would continue through the 1960s. The situation was similar on a national level. Between the mid-1950s and the early 1960s, the domestic oil

69 “Odessa Building Shatters All Previous Marks,” *Odessa American*, December 31, 1950, Odessa, Texas, 1.
70 Drilling costs increased by two thirds between 1959 and 1972. Domestic producers, clearly understanding the link between Middle Eastern politics and domestic prices, instigated price hikes throughout the 1950s and 1960s, both during the Arab-Israeli war and after terrorist damage to the Trans-Arabian pipeline. The Texas Railroad Commission restricted the number of days that oil producers could run wells and set a limit on the maximum daily rate of production for each well. Olien and Hinton, *Wildcatters*, 114.
industry carried out approximately 700 mergers and major property exchanges. Between 1952 and 1962, 15 of the 31 large independent oil companies sold on the New York Stock Exchange were either sold or went out of business. Membership in the Texas Independent Producers & Royalty Owners Association (TIPRO) – a lobbyist and networking organization for small oil companies – declined from a peak of 7,000 members in 1957 to 6,500 by 1961.\(^{71}\)

Increasingly, industry pressures came from outside the United States. In the early 1960s, the newly founded Organization of Petroleum Exporting Countries (OPEC) began flexing its muscles. Escalations in production among OPEC countries resulted in yet another oil glut, a drop in prices, and an industry downturn in the Permian Basin. Harshly demonstrating that regional elites were not as in control as they professed, both Midland and Odessa experienced a net loss in population between 1960 and 1970. In Midland, the drop in small oil companies meant a reduction in the need for office space in the city’s network of high rises offices and skyscrapers. According to Olien and Olien, between 1951 and 1969 the number of independents with offices in Midland decreased by one forth. Approximately half of these companies had gone out of business due to financial troubles.\(^{72}\)

Although Permian Basin oil companies continued to look to technology for solutions to their problems, the industry was still subject to cycles of boom and bust well beyond their control. Shuttered offices, “for sale” signs, and a rash of home foreclosures contradicted the ordered expansion promised during the early 1950s. However, in the

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1960s, the oil industry again fixated on technology and more efficient local production as a solution. While some oil producers looked on a global scale - vocally deriding economic instability caused by the increasing power of foreign oil companies and state regulations that placed quotas on domestic extraction - many simply stopped exploratory drilling and began developing strategies to maintain profitability in existing wells. The two most important strategies, unitization and well injection, resulted in fundamental changes to regional land management strategies as well as the growing ubiquity of increasingly invasive extraction systems.

The push for the unitization of Permian Basin oilfields was a significant challenge to the region’s deep social affinity for the sanctity of private property and yet another blow to the primacy of independent oil producers. The legal definition of unitization is “the consolidation of mineral or leasehold interests covering all or part of a common source of supply.” In layman’s terms, unitization designated a single operating company as manager for an entire deposit of oil. This company managed all extraction and maintenance efforts in the entire field, irrespective of surface property lines or previous mineral lease agreements. Companies who owned leases in the field and landholders who owned mineral rights on those leases agreed to a specific percentage of the total potential profit. Unitization was pushed hard as a way to maintain well pressure across an entire oil deposit, extending the life of the field as a whole. Further, unitization increased the

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effectiveness of secondary recovery systems, especially well injection, which had become increasingly common in the postwar era as Permian Basin oilfields matured.

Engineers and landmen argued that management by a single company would ensure even well spacing and a fair division of profits, however in practice it led to increased control by whichever company – most often a large multinational – was designated as the official field manager. Legal historians Gary Libecap and Steven N. Wiggins explain the challenges in this system, “Before a field is unitized, extraction occurs from each productive lease, but after unitization, the production pattern is fundamentally altered. The field becomes the production unit, not the lease, and wells are placed to maximize aggregate field returns.” In many ways, unitization was a more logical way to divide up oil operations. Surface property boundaries were meaningless underground and oil fluid mechanics guaranteed that drilling in one part of an oil deposit had a negative impact on drilling efforts in another part. However, unitization also consolidated control over land, landholders, and profits under a single, large oil company.

The push for unitization was several decades old. First proposed in the 1920s by proponents of oil conservation, the first mandatory unitization law was enacted in Oklahoma in 1945. Ever concerned about the waning power of small oil companies, Texas reluctantly made unitization legal in 1949. Other oil producing states passed similar laws during the 1950s and 1960s. In comparison to other states, especially Wyoming and Oklahoma, Texas was unsuccessful in implementing a coherent and lasting

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74 “‘Unitization’ of Oil Leases Investigated,” Odessa American, September 21, 1956, Odessa, Texas, 21.
unitization policy.\textsuperscript{76} Many Texas oil producers believed that unitization would severely hinder small oil businesses and these “independent oil man” had strong allies in state politics. TIPRO actively opposed both the legalization of unitization and successive attempts to unitize the state’s oil fields.

Echoing the region’s quick response to overproduction in the 1920s, the Permian Basin led the state in unitization agreements.\textsuperscript{77} Between 1949 and 1952, eight unitization agreements were submitted by large oil companies in the Permian Basin including Gulf, Atlantic Oil, Stanolind, and Cities Services. All were approved, demonstrating that while the Texas Legislature voiced misgivings for unitization, the Railroad Commission supported more systematic extraction methods.\textsuperscript{78} In 1953, the Texas Railroad Commission combined many of the small fields in the Sprayberry-Dean into a single large entity called the Spraberry Trend. This became the largest single producing unit in the Sprayberry-Dean field, covering approximately 500,000 acres in Midland, Glasscock, Reagan, and Upton counties.

In the 1950s and 1960s, unitization of a field was proposed to facilitate well injection efforts. Well injection refers to the process of injecting high pressure water, oxygen, or gas into an existing oil well to increase well pressure in aging oil fields and

\textsuperscript{76} Before 1985, the only region of the country in which unitization successfully became the norm was on Federal Lands. Ibid.

\textsuperscript{77} Permian Basin experiments in unitization had been lauded as a revolutionary solution to unregulated and wasteful production in the late 1920s. The API, the US Bureau of Mines as well as federal regulators and the Texas Railroad Commission all advocated increased well spacing as a way to preserve the life of producing oil fields. H. C. Miller, “Function of Natural Gas in the Production of Oil,” Report, U. S. Bureau of Mines Department of Commerce (New York: American Petroleum Institute, 1929), 5.

\textsuperscript{78} Austin Bureau, “Basin is Tops in Unitization Pacts for Texas Fields,” \textit{Odessa American}, October 9, 1952, Odessa, Texas, 4.
extend the life of oil production. Well injection was logistically complicated and very expensive. The most common form of well injection required the drilling of several new wells at strategic locations within the oil field and then using high pressure hoses to flood the subsurface oil reservoir well with millions of gallons of water.\footnote{“Dow Chemical Hydraulic Fracturing Release,” Press Release, Box 66, API Photo and Film Collection, Col 711, Smithsonian Archives Center, Washington, D.C.}

This method was partial a solution to an old problem. How to preserve well pressure within an unregulated oil deposit was a question that had puzzled engineers and scientists for decades. In 1913 geologists understood that well spacing was critical to maintaining well pressure and drillers used pumps to create suction.\footnote{L. G. Huntley, “Possible causes of the decline of oil wells and suggested methods of prolonging yield,” U.S. Bureau of Mines, Washington D.C., Government Printing Office, 1913, 29, Box 6, Warshaw Petroleum Collection, Col 60, Smithsonian Archives Center, Washington, D.C.} By 1927 it was clear that keeping a constant high level of underground pressure was key to the suction that drove oil up well pipes. However, it was notoriously difficult to enforce well spacing laws and extraction quotas.

Research into ways to augment well pressure dominated petroleum engineering during the late 1920s. In a pamphlet written for the API, Hugh S. Taylor of Princeton University described the principles of well pressure and confirmed theories that injecting water into a well would boost the amount of oil captured.\footnote{Hugh S. Taylor, \textit{The A B C’s of Science in Oil Recovery}, New York: American Petroleum Institute, 1927, 11, Box 6, Collection 60 Warshaw Petroleum Collection, Smithsonian Archives Center, Washington, D.C.} That same year, the US Bureau of Mines (BOM) and the API conducted an exhaustive survey of the use of natural gas in oil wells across the country. In the 1929 report, the BOM concluded that
natural gas deposits played a key role in maintaining well pressure. Further publications from both organizations concluded that natural gas was lighter than oil and traveled more quickly, therefore a sudden change in oil extraction would result in a loss of well pressure. Unregulated extraction in natural gas fields resulted in the vaporization of natural gas deposits, making the natural gas impossible to harvest. The BOM further concluded that water or air injected at high pressure could be used as an alternative for natural gas. However, reports stated that this method was a poor secondary measure and, ideally, natural gas should be preserved in the well.

Citing such research, the Texas Railroad Commission argued that unitization prevented natural gas waste. By the 1960s, much of the Permian Basin’s natural gas deposits had been burned off in the search for oil. The Railroad Commission estimated that until the practice was outlawed in 1953, 220 million cubic feet of natural gas had been burned off each day since the 1920s. In the postwar period, the increase in the demand for natural gas made it highly desirable to preserve deposits which could be sold to the El Paso Corp and other distributors for large profits. According to the Railroad Commission, careful management of well pressure in an entire oil deposit delayed the need to install expensive pumping or well injection systems. With these arguments in mind, by 1959 all Texas oil leases between forty to 160 acres in size were managed using unitization.

Oil contractors approached waterflooding as the obvious next step in oil

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82 The BOM concluded that not only did natural gas increase pressure created between oil and the surrounding sand and rock, but it also reduced the viscosity of oil, making it easier to pump out of the well. H. C. Miller, *Function of Natural Gas in the Production of Oil* (New York: American Petroleum Institute, 1929).
extraction. A 1952 annual report from the Wichita, Kansas based Vickers Petroleum, described using both water and gas injection in combination to direct oil to specific extraction points. Vickers advertised both water and gas as incredibly cheap, easily accessible resources. According to Vickers, water was infinitely renewable and the gas used in well injection was the recycled byproduct of oil extraction. As early as the late 1950s, Permian Basin leaseholders commissioned Red Davidson and other local drilling contractors to estimate the cost of waterflooding in the Permian Basin to boost well pressure. Both water flooding and water injection began in the Sprayberry-Dean field and others followed suit. In 1958, the Welch Field Engineering Committee, an organization that managed the Welch Field in Gaines and Dawson County, commissioned a report on the cost and effectiveness of water flooding. The report concluded that the field should be unitized and that waterflooding should be applied to significantly increase production. As the 1960s continued, this idea became more popular. In 1962, Red Davidson and a committee of engineers gave similar recommendations to leaseholders in Crane County.

Despite the recommendation of local engineers, regional aridity made well injection a particularly fraught prospect in the Permian Basin. Well injection required access to massive amounts of water. Once injected into the well, this water was not

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84 Although the field was located directly adjacent to nearby Cedar Lake, the study did not include analysis of the impact of water flooding on local water sources. Welch Field Engineering Committee, “Engineering Study of the Welch Field San Andreas, August 1958,” Folder ‘Welch Field Engineering Committee Reports 1957-1959,’ Box 83-021, C.J. "Red" Davidson Collection, Permian Basin Petroleum Museum, Midland, Texas.
recoverable. In Texas, groundwater was regulated in a system very similar to oil – surface owners could do what they will with the groundwater beneath their land, regardless of the consequences to adjacent properties. However, in the Permian Basin, water was in very short supply. As the population of the Midland/Odessa metro ballooned immediately after World War II, both cities faced extreme water shortages. While lack of water had been a barrier to regional settlement for hundreds of years, urban development put new strain on the regions scarcest resource. As the *Odessa American* put it in 1950, “…a city cannot grow beyond its water supply.” Developers in both cities were increasingly concerned about securing a stable water source that would allow for continued urban expansion. Before 1950, both Midland and Odessa subsisted almost completely on well water. Citizens were often asked to ration water during the summers and complete city well depletion was announced every few years. Reservoir creation was deemed the most expedient solution. But no flowing surface water was nearby. In 1950, Odessa led efforts to dam the Colorado River, located approximately three hundred miles east in Borden County. The resulting reservoir supplied the newly founded Colorado River Municipal Water District (CRMWD) through a series of pipelines. In 1951, other cities in the region began building desalination plants to purify brackish groundwater. For over a decade,

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86 By 1949 it was legal to establish voluntary conservation districts which could enact limitations on private water holders. However, this law was rarely enforced. Otis W. Templer, “Texas Ground Water Law: Inflexible Institutions and Resource Realities,” *Ecumene*, 10 (April 1978).

87 For example, annual water usage rose in Odessa from 206,600,000 gallons in 1938 to 1,403,950,000 gallons in 1950. D. B. Knowles, “Ground-Water Resources of Ector County,” Texas Board of Water Engineers, Bulletin 5210, 1952, 16.


89 “Many Texas Cities Wailing for Water,” *Odessa American*, July 15, 1951, Odessa, Texas, 1.
Midland opted out of either plan, choosing instead to lease land and drill a series of new water wells.\textsuperscript{90} In 1966, the city of Midland abruptly joined the CRMWD, citing depletion of these new wells.\textsuperscript{91}

Oil companies were aware of the region’s water problem. In Odessa, the El Paso Petrochemical Complex required millions of gallons of water daily. Much of the remaining supply was already earmarked for urban consumption, livestock watering, and crop irrigation.\textsuperscript{92} Both securing water rights and water transport were expensive prospects. In the middle of this growing crisis, the “1958 Welch Field Engineers Report” called for several million gallons of water to run the proposed waterflood program. The report also concluded that the field could only access a few shallow wells and would be competing for water rights with agricultural irrigation.\textsuperscript{93} Competition between urban expansion and the needs of the oil industry put new strain on the region’s meager groundwater. While few regional residents publicly opposed well flooding proposals over concern about water usage, most of these projects stalled for the next decade. With oil prices low during the 1960s, drilling new wells was often prohibitively expensive and


\textsuperscript{91} The Oak Creek Reservoir built in 1954 near Sweetwater cost an estimated $2.7 million. Robert L Martin, \textit{The City Moves West: Economic and Industrial Growth in Central West Texas} (Austin: University of Texas Press, 1969), 143.

\textsuperscript{92} A series of droughts in the late 1940s had increased the use of irrigation on farms statewide. AP, “Drought Shown Need for Reservoirs Engineers Say,” \textit{Odessa American}, September 8, 1946, Odessa, Texas, 5.

securing water rights and building the infrastructure necessary to move the water was a logistical challenge many did not want to undertake.

Oral histories record few comments on either unitization or waterflooding among regional landowners or urban administrators. Ranchers such as Elliot Cowden and George R. Bentley spoke of large oil companies as benefactors that allowed ranchers to survive hard times. While they expressed dismay at the decline of the region’s oil reserves, they described water flooding as a necessary tool.94 Smaller oil companies resisted these efforts most strongly, arguing that unitization gave large companies an unfair advantage. Independents never disputed the fact that unitization made oil extraction more predictable, however they argued that large oil companies would use their administrator status to win debates about dividing revenue and well maintenance costs. According to Olien and Olien many of these small producers turned to local politics to maintain regional importance, viewing their relationship with the federal government, foreign oil producers, and larger oil companies as a fight for survival.95

For the duration of the 1950s and 1960s, tensions between large and small oil companies articulated the tradeoff between efficient extraction and large company control. Some Texas oilmen were still ambivalent about new technologies. An oral history interview with W. W. Aliman of Crane, Texas conveys this perspective, “I think, yes, today I would take the money that they actually spend on geology and pit it into

drilling and I would come out with more oil than they will.” However, for the Majors, the massive influx of knowledge about the natural world brought by new oil technologies and the increasingly ordered processes of extraction helped to ensure industry longevity. Writing in the 1970s, Moody Boatwright described this temperate, ordered, landscape, “An orderly development has replaced the periodic chaos that formerly occurred when the discovery of a new field created boom towns and often flooded the market with oil that sold for less than water, and wasteful methods left more oil in the ground than was recovered.” Boatwright saw much of this stability as the result of new discovery technologies that made the process of oil discovery more scientific, “This orderly production has been made possible by the development of instruments for securing the data necessary to determine the best procedures for obtaining the maximum recovery in any field and by the revision of state and federal laws to make enforcement of these procedures possible.”

Industry publications, oil company publicity, and employee magazines pushed this story of innovation and precision hard. Trade literature during this period was marked by reflections on the industry’s history of wastefulness and the widespread efficiency brought by new technology. For example, a brochure from the Socony-Vacuum oil company titled “Expanding Horizons” captioned a photo of an oilfield fire, “A terrifying spectacle of early days. Modern prevention methods make fire a rarity.”

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97 Boatwright, Tales From the Derrick Floor, 224.
98 “Expanding Horizons” Socony Vacuum, Folder ‘General Petroleum Corporation Histories Folder 1 1923-1958,’ Box 2.207/E214, EXXON Mobil Historical Collection, Briscoe Center for American History, University of Texas, Austin, Texas.
Other publications such as *Oil Weekly*, *Petroleum Refiner*, and *Oil and Gas Journal* pushed this message. An article on the history of the oil industry described the nineteenth century as an “amoral setting” that “quickly developed practices which later came to be condemned.”99 Describing current expansion, a Cities Services ad in *Oil and Gas Journal* described new innovation as “again up steps progress in petroleum.”100 Another described future invention, exclaiming that the “greatest oil field is in the minds of men,” and that the true “petroleum age” was still yet to come.101

Such editorializing placed industry control in the hands of American CEO’s and petroleum engineers. It bypassed the realities of OPEC’s increasing control over oil prices and the increasing importance of offshore drilling to domestic oil companies. It also ignored the inevitability of oil depletion. On a local level, such boosterism ignored the growing conflict between urban expansion and water use in oil production. Most importantly however, increased technological efficiency and greater knowledge of regional geology was not applied to the protection of regional ecology or public health. Instead, as oil companies developed new methods for extracting oil, they produced ever-increasing consequences for the region’s people and organisms. Oil workers in the Permian Basin, building from fifty years of an oppositional relationship with nature, increasing economic dependence on oil extraction, and clinging to a utopian faith that new technologies would always bring solutions, were largely complicit in this destruction.

100 *Oil and Gas Journal*: *Golden Anniversary*, 107.
101 Ibid, 54.
In this way, efforts to increase the boundaries of human control over nature backfired, in at times spectacular ways. Signs of environmental strain were obvious in the oil fields. Cyclical drought gripped the region once again for much of the 1950s and 1960s. Groundwater became increasingly brackish as well flooding hastened the depletion of the region’s scarce groundwater. As existing wells were depleted, oil deposits slowly filled with salt water let in through cracks in destabilized subsurface geology. Sometime rural hazards became violently obvious. In 1955, a pipeline explosion near Crane, Texas killed one repairman and injured two others. A similar accident took place in February 1961 as car exhaust from a man driving on Farm Road 1936 ignited leaking oil from a nearby pipeline. The driver, Earnest Crain, was severely burned in the resulting explosion. According to the Odessa American, “A large area – about five miles west of Odessa – was turned into an inferno immediately after the explosion with flames shooting as high as 40 feet into the air near the center of the fire.” After the fire, Humble admitted that the pipeline had a chronic leak problem, with documented ruptures on January 1 and January 3, 1961.

Urban contamination was more extreme but less publicized. People living in the region’s network of oil processing communities experienced increased air and water contamination from plant burnoffs and unregulated wastewater disposal. Midland and

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105 “Correspondence (pre 1980) TCEQ WST IHW 30142,” Microfiche, Texas Commission for Environmental Quality, Central File Room, Austin, Texas.
Odessa, as hubs for both regional oil transport and petrochemical manufacturing, were subject to increasingly dire public health consequences. Expanding residential construction in both Midland and Odessa butted up against the region’s oil fields. In Midland, the meeting point for the region’s pipeline network, well water contamination from line breaks was common. In Odessa, expansion to the Petrochemical Complex increased both air and groundwater contamination. Both cities’ black and Latinx neighborhoods were located closest to the sources of such environmental contamination. While some official reports do exist from this period, hinting at increasing levels of contamination, it can be assumed that white elites in heavily segregated Texas were not concerned about environmental contamination in these neighborhoods. While such examples of increasing contamination demonstrate the limits of the industry’s much lauded control over nature, it also shows that racism and social division blinded industry elites to serious problems.

Despite Midland’s white collar pretentions, much of the city’s wealth came from the maintenance and administration of a regional pipeline network that converged inside the city limits. In 1955 Midland was the largest crude oil distribution center in the Permian Basin with a daily capacity of 1,400,000 barrels.\textsuperscript{106} Throughout the 1950s, eleven oil pipelines originated in Midland. Six of these lines were transcontinental. A natural gas pipeline owned by the El Paso Corporation, which also owned the Odessa Petrochemical Plant, ran from the Permian Basin to El Paso, another north to Amarillo.\textsuperscript{107} The rest of these lines headed east to Mid-Continent refineries in Oklahoma, Missouri,

\textsuperscript{106} Weber, “A Comparison of Two Oil City Business Centers,” 25.

Like most cities in Texas, Midland maintained strict segregation policies. According to the 1960 census, in Midland there were 1,350 families who identified as nonwhite and 600 unrelated individuals, making up about ten percent of the population.\footnote{US Bureau of the Census, “General Social and Economic Characteristics, Texas,” US Census of the Population – 1960, accessed June 6, 2017, https://www.census.gov/prod/www/decennial.html.} The majority of the city’s black and Latinx residents lived on the far southeastern edge of town, bisecting the Texas and Pacific Railroad track. While no Census data from this period exists that identifies the city’s Latinx population, other evidence suggests a community of several hundred people, living directly west of Midland’s black neighborhood.\footnote{The 1960 Midland City Directory listed two churches with Spanish names, the Iglesia Bautista Immanual at 1800 N Lincoln and the Primera Iglesia Bautiste Oriente at 1609 E Orchard La. The directory also lists Our Lady of Guadalupe Catholic Church at 1401 Garden Ln. and the Mexican Baptist Mission at 501 N Tyler. “Churches,” Midland City Directory 1960-1961 (Austin: R. W. Byram & Company, 1960), Permian Basin Petroleum Museum, Midland, Texas, 120-121.}
According to demographic studies from the period, segregation significantly impacted quality of life for residents of this black and Latinx neighborhood. In 1959, the median income for a nonwhite family living in Midland was $3,489.\textsuperscript{112} Comparatively, Midland’s median income, at $6,936 for the total population, was the highest in Texas. Oral histories from this period demonstrate that the midcentury oil industry was strictly segregated. According to the census, the city’s black population was employed as semi-skilled machine operators, laborers, service workers, or worked in private homes. 1,183 worked in personal service. 429 worked in wholesale and retail trade. None of these jobs lent themselves to stable incomes or secure credit.\textsuperscript{113} Community poverty and job insecurity was reflected in neighborhood housing. A study done for the “Case Studies in Racially Mixed Housing 3: Midland Texas” described this neighborhood as made up of “two-and three-room shacks, frequently lacking some or all standard plumbing facilities.” Roads were not paved.\textsuperscript{114}

In the late 1950s and early 1960s, this neighborhood expanded. As the postwar boom slowed and the population flatlined, Midland realtors became desperate to unload excess inventory. As wealthy whites moved into larger homes on the city’s west side, older, smaller homes were left abandoned. Most of the vacancies concentrated on the far east edge of town, just north of the predominately black and Latinx neighborhood. In

\textsuperscript{112} According to the US Census, in 1960 the average median family income across demographics was $6,936. The state average was $4,058. Although segregation was more pervasive in Midland than in other urban areas, median nonwhite income was significantly higher in several other Texas cities. US Census Bureau, “Income,” US Census of the Population – 1960, accessed June 6, 2017, https://www.census.gov/prod/www/decennial.html.

\textsuperscript{113} Ibid.

1959, according to a report given at the Princeton Conference on Equal Opportunity in Housing, approximately 1,100 of these smaller homes sat empty. During the 1960s, nonwhite families bought these homes, expanding the existing black neighborhood.\textsuperscript{115} For many, movement north was a significant step up. These homes were detached, connected to both the city water wells and the city electricity grid.

Poorer residents who were unable to make this move north encountered significant consequences from the city’s network of pipelines. The biggest problem was water contamination. During the 1950s, Midland residents relied almost completely on well water for drinking and bathing. In 1956, the City of Midland purchased water rights on 20,000 acres northwest of the city.\textsuperscript{116} This move, followed by admission into the Colorado River Authority in 1961, helped fix the water quality problem for most residents. However, families in Midland’s unincorporated, non-white neighborhood relied on private wells dug directly beneath their homes. Such wells were dug directly into land bisected by the city’s pipeline network. These wells were unlined, often ran dry in the summer, and were easily contaminated when pipelines leaked.

Official evidence documenting these issues is scarce. In the 1950s and 1960s federal and state authorities enforced few regulations governing pipeline construction in urban areas. The State of Texas had implemented some regulations for oil pipelines in the 1930s, but these regulations were to prevent monopoly, not encourage public safety.\textsuperscript{117}


\textsuperscript{116} Martin, \textit{The City Moves West}, 146.

\textsuperscript{117} In the 1970s, the Texas Railroad Commission became responsible for enforcing federal minimum pipeline safety standards. Childs, \textit{The Texas Railroad Commission}. 
While the issue of industry waste received significant coverage in the local press, industry contamination was considered less important. Newspapers did not report small pipeline breaks and oil companies rarely caught pipeline leaks until they produced visible, surface seepage. The fact that water quality was a significant issue for the city’s poorest minority residents did not encourage elites to investigate the problem.

A similar story of race-based contamination played out in Midland’s sister city. During the 1950s and 1960s, Odessa’s wealthier population of industry foreman, machinists, and independent oil drillers moved into a growing network of suburbs north of town, abandoning aging, central-Odessa neighborhoods nearest to the vast Odessa Petrochemical Plant to obvious air and water contamination. While contamination in Odessa was better documented, state regulatory documents demonstrated that city officials were similarly reluctant to oppose oil industry expansion in the name of minority public health.

In 1956, El Paso Corp. and the Odessa Chamber of Commerce located the Odessa Petrochemical Complex five miles southwest of central Odessa on undeveloped, unincorporated ranchland. The land was cheap and relatively isolated, with an average price of only $25 per acre. The city’s initial residential expansion was largely confined to the north and east sections of town, far from the Petrochemical Complex. However, a large industrial corridor quickly grew up around the plant, with the majority of the city’s oil-producing population working within earshot of the vast complex. Environmental Protection Agency and Texas Commission for Environmental Quality reports from the

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early 1970s retroactively reveal an array of problems at the plant during the 1960s, including air pollution, crude oil and other chemicals in the city water supply, and high levels of chemicals in the nearby stream, Monahans Draw. Suggesting that local populations were at least nominally aware of pollution from the plant, during the 1960s, the city’s elite – the growing population of white collar plant managers, engineers, and sales managers – began moving even further north to newly constructed suburbs. As housing prices dropped in the older, central Odessa neighborhoods closest to the plant, lower income and minority families moved in. As the plant expanded over the next two decades, increasing resident complaints were met with silence from local administrators and state regulatory officials.

119 “TCEQ WST IHW 30142 Correspondence MF307609 1-16 (pre 1985),” Microfiche Archives, Texas Commission for Environmental Quality, Austin, Texas.
Instead of engaging with the human consequences of oil development, new technologies and continued urban growth allowed industry elites to elide the oil industry’s human context in favor of a utopian focus on technological potential. While the seismograph, the magnetometer, and other technologies clearly mapped the subsurface world, they replaced the human senses as the final authority in oil discovery. As a result, engineers, geologists, and landmen increasingly understood local ecology, geology, and natural resources as a series of lines on a page. Thus decontextualized, the promise of extended prosperity embodied by sweeping, vertical urban growth in Midland, made the tradeoff between regional water quality and expanded oil production an easy choice. Finally, the realities of urban segregation allowed white oil workers to avoid thinking about oil expansion’s public health costs.

By placing the unequal cost of industrial expansion in both Midland and Odessa next to industry booster efforts, it becomes clear that the language of environmental control and the belief that the oil industry had fully harnessed nature hinged upon an exploitative industrial system. This system required minority populations – and the consequences of oil industry expansion - to exist both out of sight and out of mind.¹²⁰ Barred from work in Midland’s new downtown skyscrapers or from living in the growing network of large suburban homes, African Americans and Latinx populations were

simultaneously excluded from the region-wide network of oil rigs, refineries, and processing plants that visually and economically dominated the region and determined the direction of its social future. In the 1970s, this exclusion would only make it easier for industry leaders to push for ever-increasing industry expansion as a solution for regional troubles.
Chapter 6
The Game is Almost Over: Oil Wealth and Creeping Nostalgia

The oil embargo of 1973 struck the American oil industry hard. In October 1973, in response to US support for Israel during the Yom Kippur War, the Organization of Arab Petroleum Exporting Countries (OAPEC) sharply curtailed crude oil imports to the United States. In early 1973, US net oil imports were approximately three million barrels of oil per day, mostly from OAPEC countries. This number dropped sharply after the embargo. Long lines at the gas pump, increased consumer prices, and a growing sense of national insecurity permeated the popular press. Oil companies were again accused of inefficiency, bad management, and conspiracy. In a 1973 “Hearing Before the Joint Legislative Committee on Transportation and Utilities,” Mobil Oil CEO A. E. Murray bemoaned the industry’s bad press, “Almost daily it seems, some new charge is reported, to the effect that the “energy crisis” is merely an invention of the oil companies. The companies have somehow “created” a fuel shortage, we hear, to raise prices or to drive

1 This should not be confused with OPEC, the oil export organization that included several South American countries as well as the Middle East.
3 Throughout the 1950s and 1960s Texaco was the main stock holder in ARAMCO in Saudi Arabia. The Saudi’s fully nationalized their oil industry in 1980. After nationalization, the Middle East became US oil companies biggest competitor. See Daniel Yergen, The Prize: The Epic Question for Oil, Money & Power (New York: Free Press, 2008).
independent marketers out of business."\(^4\) Despite diplomatic intervention that increased oil imports in 1974, the embargo was a sharp wake up call for the Majors which quickly reinvested in domestic oil production.

What was a public relations nightmare for American oil companies was an opportunity for Permian Basin producers. While the regional industry had been in decline in the late 1960s, the spike in oil prices after 1973 made deep drilling and expensive and invasive well flooding techniques incredibly profitable. Federal calls to immediately decrease dependence on foreign oil led to industry deregulation and a nation-wide drilling boom. New oil exploration took place in the Anadarko Basin of Western Oklahoma and the Texas Panhandle. Significant oil drilling also picked up again in established Permian Basin fields, especially in the Delaware and Midland Basins.

As a result, the decade between 1973 and 1983 was the climax of the Permian Basin’s seventy-year oil boom. Worry about regional oil depletion was put aside as regional producers set new records. Wildcat drilling operations rose 21.6 percent in 1974 and in 1975 total well completion rose 30.8 percent.\(^5\) Workers once again flooded the region’s oilfields. Oil processing and petrochemical production expanded.\(^6\) As the region’s network of oil refineries and pipelines began a new wave of expansions, average wages in these technical jobs continued to increase. Regional oil wealth reached new

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\(^5\) These numbers declined a bit in the late 1970s, but increased again in the early 1980s. Texas Railroad Commission, Oil and Gas Division, Annual Reports, 1969-1981.

\(^6\) Box 2E200 and 2E201, Mid Continent Oil and Gas Association Records, Briscoe Center for American History, University of Texas, Austin, Texas.
heights, with median income and oil royalties rising exponentially, even when compared with previous booms in the 1920s and 1950s. Newly wealthy employees built mansions, invested in second homes, and bought boats, cars, and other luxuries.

This industry rebound took place during an era of general economic slowdown and stagflation in the rest of the United States, making the region’s prosperity – and obnoxious spending – relatively unique. However, long-time industry employee Walter Cline described changes to the oil industry in terms of loss:

In those days it was a game, strictly a gamble. Nobody had any scientific data or information nor wanted any. They wouldn’t have believed a fellow if he’d a told them. The used the hunt and peck and look system and let the best man win. And today it’s a highly technical business, down to the point where it’s far too complicated and too much involved with experts and advisers for me to ever make a success of trying to operate it. I could play it when it was a game. I know how to play games, but I’m not very good at a technical business, and game was what we had in the early days in the oil field.7

Cline’s words echoed oil booster rhetoric of the same era – like the promoters of directional drilling and waterflooding he emphasized advances in technology and precision in oil exploration. However, Cline also heavily lamented the end of “the game” and the increasing importance of scientific experts. Cline continued, “The technicians and the fellows — the Phi Beta Kappas — began to make themselves felt…. we’ve lost the romance and heroism and the flavor of the good old days.”8 Cline is not an anomaly. Many oral histories taken between 1970 and 1975 described a similar sense of loss among the region’s working-class oil personnel.9

7 Tales from the Derrick Floor, 226.  
8 Ibid.  
9 W. W Allman and his wife also lamented the loss of self-directed, independent oil workers, accusing 1970’s workers of hiding behind labor unions and workplace safety laws. Both also commented on rising drug problems in the industry saying that in the 1930s workers’ “addition[s] were limited to alcohol,” W. M. Allman and Mrs. Allman,
This is not to say that faith in technology waned. Few argued for a return to cable tool drilling or steam powered machinery. However, in the regional press and company publications industry expansion was couched in language that merged now-ubiquitous technological utopianism with early-twentieth century platitudes about human competition with the environment and individual success through grit and determination. Computerized oil tools were advertised using folksy cowboy language. The Odessa Oil Show increasingly played upon ranching iconography. Local oil elites formed historical societies and trust funds to preserve the region’s cowboy culture. Others invested in vast vanity ranches that recreated an imagined, freewheeling, and racially white version of 1880s West Texas.

It might seem odd that as the regional oil industry made so many fabulously wealthy a growing number of oil workers, company personnel, and local administrators retreated into self-conscious nostalgia. Cowboy symbols and roughneck tall tales became even more ubiquitous in civic displays, public buildings, and industry memorials. Breaking with established narratives of increased environmental control and order, these displays celebrated the industry’s dangerous, unregulated “good ole days” as something that had been lost – as opposed to an obstacle long overcome. However, a look at broader national context links this nostalgia to an array of unavoidable industry problems without quick solutions. Nostalgia was an easy panacea for many who felt powerless within an increasingly automated, globalized oil industry.

As early as the late 1960s, renewed national union agitation and environmental legislation increasingly held oil companies accountable for environmental contamination and deteriorating community health. Although Texas and Permian Basin officials only reluctantly enforced environmental and workplace safety legislation, it was harder for residents to ignore federal inspections, employee lawsuits, and well-publicized industry disasters. These trends directly contradicted two decades of utopian calls for further oil industrialization and the more recent ostentatious displays of oil wealth. Further, trends begun in the 1960s that made oil work more precarious and reduced regional autonomy sped up during the 1970s. The increasing importance of overseas and offshore oil, waning American oil industry hegemony, and the growing threat of automation in refineries and petrochemical plants made oil jobs much less stable than in years past.

In this climate, appeals to nostalgia provided oil workers a connection to an uncomplicated, individualized past. Scholars have documented the waning of industrial unionism, and anxieties about fading masculine workplace autonomy and independence in the 1970s.\(^\text{10}\) Others have emphasized the impact of new environmental regulatory agencies on the energy industries.\(^\text{11}\) In the Permian Basin, these trends were countered by incredible prosperity and a business culture dominated by the oil industry’s tradition of impermanence and speculation. Oil workers in the Permian Basin focused on their current wealth, connecting it to a rose-colored version of the past that reframed oil contractors as rugged, independent entrepreneurs and oil companies as community-

preserving benefactors. Nostalgia allowed oil workers in both the oil extraction and processing industries to ignore the increasingly obvious warning signs of environmental strain and looming economic instability.

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Despite the extreme profits made over the course of the 1970s boom, all was not rosy in the oil business. Throughout the 1960s, Texas oil workers had vocally protested that automation, scientific management, and the increased use of contract labor posed a threat to jobs and wages in the formerly stable oil processing industries. In the 1970s, automation exacerbated the majors’ already extensive control over oil policy and industry expansion. In the Permian Basin, some grew increasingly concerned that small companies were being pushed out by larger, out-of-state operations.\(^\text{12}\) Statewide, these trends widened a wedge between oil workers and industry management, with major strikes erupting along the Gulf. This wedge grew bigger over the course of the decade as the OCAWU, other unions, and new federal regulatory agencies directly confronted refinery and petrochemical workers with the industry’s public health and environmental hazards.

From the perspective of management, automaton was an effort to reduce labor costs in an industry with increasingly narrow profit margins. Between 1974 and 1981 the cost of borrowing money for oil drilling increased dramatically, with prime interest rates rising from 10.81 to 18.87 percent.\(^\text{13}\) After the 1973 embargo, Major oil companies

\(^{13}\) Board of Governors of the Federal Reserve System (US), Bank Prime Loan Rate [DPRIME], retrieved from FRED, Federal Reserve Bank of St. Louis, accessed January 31, 2017 https://fred.stlouisfed.org/series/DPRIME.
reinvested in domestic exploration, sharply driving up the cost of oil leases.\textsuperscript{14} This trend reached a peak in 1980 with companies spending millions on even small, unproven leases in the Permian Basin. That year Texaco paid a total of $3.6 million for a 320 acre lease on land owned by the University of Texas System in Ward County. Similarly, Mobil paid University Lands $1.6 million, Exxon paid $3 million, Getty paid $1.7 million, and Monsanto paid $7.1 million.\textsuperscript{15}

Further, because most of the Permian Basin’s oil fields were already depleted, only companies that could afford new, increasingly expensive oil extraction technologies could compete. Between 1974 and 1976, the rate of increase in costs and services and equipment (such as drill bits, drill pipe, or seismograph testing) doubled.\textsuperscript{16} These costs were exacerbated in the Permian Basin by already high labor and equipment costs associated with drilling below 10,000 feet. Some fields required specialized equipment. For example, exploratory wells in the Abo Reef Trend near the Mexican border were only possible using the borehole gravimeter.\textsuperscript{17} As oil prices skyrocketed, logistically complicated and expensive well injection systems became increasingly common.

\textsuperscript{14} Beginning in the 1950s, large oil companies increasingly invested in offshore and foreign oil deposits, leaving the more expensive and largely depleted domestic oilfields to smaller companies. This trend reversed for a time after 1973.
\textsuperscript{15} The records of lease bonus payments – payments to leaseholder upon the strike of oil – on university of Texas land are public record. University of Texas System Public Auction Sales of Oil and Gas Lease File, Texas State Archives, Austin, Texas. From the perspective of large oil companies these prices were small potatoes. In 1981 Exxon increased its total global production budget to 1.4 billion from a 1980 budget of $910 million. Press Release, EXXON Corporation, 1981, Box 66, API Photo and Film Collection 711, Smithsonian Archives Center, Washington, D.C.
\textsuperscript{16} By 1979 the average cost to drill a single US well was over $300,000. “U.S. Drilling Outlay Jumps 23% During 1979,” \textit{Oil and Gas Journal}, March 16, 1981, 43.
\textsuperscript{17} Olien and Hinton, \textit{Wildcatters}, 114.
With the majors outbidding smaller companies for drilling leases and with both loans and drilling equipment harder to obtain, the transition of power from independents to majors in the Permian Basin was complete. This trend hurt regional labor power and slowed localized wealth accumulation. In the early-twentieth century, most drilling operations were small, with workers contracted only for a single job, often by a large oil company. However, a significant percentage of these small drilling operations also owned the oil lease, maintained the well after drilling, and stood to either profit or lose based upon the results of exploration. This changed over time. The earliest available statistics from 1935 documented that 68 percent of exploratory drilling was completed by contractors. This number steadily increased, with a spike in the use of contractors jumping from 70 percent to 75 percent between 1942 and 1943. After World War II, large oil companies downsized their internal drilling operations. By 1966, contract labor made up 97 percent of all oil drilling efforts. This made any efforts at labor organizing or collective bargaining even harder.

By the 1970s, even the drilling industry’s new white-collar workforce was made up of contractors. Specialized trucking operations, well inspection teams, casing installation crews, directional drilling services, well fishing teams, and other specialty services were all hired on a case-by-case basis. However, while independent contractors increasingly dominated the daily processes of oil exploration in West Texas, more and more large

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18 Large oil companies would contract out to very small companies who might own one or two drills. Kennedy, *Fundamentals of Drilling*, 13, Hagley Museum and Library, Wilmington, Delaware.
19 Ibid.
companies, based far from the Permian Basin, held the leases and reaped the majority of the profits. Contract drillers were paid either by the number of days on the job or by total footage drilled, not in royalties on the oil discovered. As national unemployment crept upward over the course of the 1970s, more and more people headed to the oilfields looking for work. Workers were easily hired and easily fired and, in a tradition as old as the industry, workplace dissatisfaction was most often expressed by moving on to a new job.

Automation exacerbated these trends. Coinciding with innovations in oil detection technology and geophysics, by the mid-1950s, the drilling process was much more exact and less labor intensive. Tool standardization decreased the need for on-site repairmen. Drill bits were designed for specific rock formations and less likely to break. The mixture of different chemicals in drilling mud was tweaked depending upon specific geological conditions. By 1983, eighty percent of oil rigs were powered by diesel as opposed to the more cumbersome steam engines. Such trends transformed oil drillers from largely autonomous masters of their craft into skilled technicians, with much of the geological assessment and drill placement calculations done by the machines themselves. Rigs included automated systems for monitoring weight on the drill bit, mud pump pressure, and rotary speed. Most Permian Basin operations included computerized well logging equipment and data recording devices.

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21 Ibid, 35.
22 Well Records, Folder ‘Ruth Bennett # 2, 3, 4, 5 Well Records and Casing Rpts Yoakum County, TX 83-021 C. J. Red Davidson,’ and Reports, Folder ‘West Welch San Andreas Unit: Operating & Unit Agreements Participation Factors 83-021 C. J. Red Davidson,’ C. J. Red Davidson Collection, Permian Basin Petroleum Museum, Midland, Texas.; “Learning about Computers,” Systems and Computer Service Department, Mobil
Due to these new technologies, the number of employees paid directly by an individual oil company decreased. Unskilled jobs such as digging waste pits, moving oil tanks, or pushing the drill inside the hole were either removed or augmented by heavy machinery. In desert conditions, new rigs were designed to be hitched to trucks and transported intact from well to well, reducing the need for rig building crews. In the 1920s, seven men had been needed per wildcat operation, most to handle heavy manual tasks. By 1970, this number decreased to just three skilled technicians: the driller, a floorman, and a derrickman. While many other people were often present at the drill site, including an array of surveying and well logging contractors, the rig supervisor, and representatives of the managing oil company, 24-hour manual supervision was no longer necessary. New well maintenance technologies also required fewer people. Christmas trees and automated pressure sensors prevented most catastrophic gushers and well blowouts and reduced the need for constant human monitoring. By the 1970s, many oil pipeline transfer stations were monitored by computers which sent microwave signals down the pipeline to check for leaks.

All of these innovations made the job less physically taxing and workplace accidents much less likely. It also drastically cut labor costs. But it also decreased the

Oil Company, 1985, Box 2.207/E33 Exxon Mobil Historical Collection, Briscoe Center for American History, University of Texas, Austin, Texas.

23 “Trade Catalogues – 1951 Baker Oil Tools Inc.,” Folder ‘Hughes Tool,’ Trade Literature Collection, Smithsonian Archives Center, Washington. D.C.; Box 40, Box 66, API Photo and Film Collection, Col 711, Smithsonian Archives Center, Washington. D.C.


25 Kennedy, Fundamentals of Drilling, 50-52.; Box 45, Col 711, API Photo and Film Collection, Smithsonian Archives Center, Washington. D.C..
number of unskilled jobs available in the industry and curtailed opportunities for
advancement without specialized training. The increased importance of computers sped
up processes begun in the 1960s. On-the-job technical experience became less valuable
than engineering degrees.

Industry human resources and advertising copy from the late 1960s and 1970s
demonstrate that oil management sought to make employees comfortable with a
decreased level of autonomy. EXXON passed out a variety of materials to their
management staff hoping to preemptively appease employees. A 1968 speech by John F.
Kinkaid, Assistant Secretary of Commerce for Science and Technology, titled “Business
in an Age of Accelerating Change” expressed excitement at advancements in computer
research and development but cautioned that increased technologies came with new
challenges. This was paired with the management manual, “Overcoming Resistance to
Change,” which explained that effective management could convince employees that
automation would not disrupt their economic or interpersonal security.26 Other manuals
taught EXXON employees how to use computers for word processing and data
management. In the ominously titled journal Supervision: The Magazine of Industrial
Relations and Operating Management, an article titled “How to organize a self-
development program: A blueprint for making that fellow we see in the mirror a much

26 This memo offered vague psychological analysis of employees, it explained that “The
lesson for management is that any chance can develop into a human relations problem
and that such problems were often due to employee “insecurity” and lack of “job
satisfaction.” Instead of addressing material reasons for insecurity of lack of satisfaction,
the memo advised better communication strategies to diffuse conflict. “Overcoming
Resistance to Change,” Folder ‘Corporate Administration, Human Resources, Education
& Training, Management I, 1974,’ Box 2.207/E33, Exxon Mobil Historical Collection,
Briscoe Center for American History, University of Texas Austin, Texas.
more valuable piece of human machinery” reassured employees that they could develop new skills in the wake of automation.²⁷

Advertising for the Houston-based, Hughes Tool Company also put a positive spin on automation. Hughes Tool’s descriptions of the company’s “managed maintenance plan” illustrated the bureaucratization of both oil tool repair and oil drilling. Originally a drill bit manufacturing company, beginning in the 1960s Hughes Tool branched out to provide “return on investment analysis” for all their machines. A team of maintenance engineers inspected all Hughes machines and predicted the time until replacement, the cost of replacement, and suggested new work scheduling models that would increase the life of the machine. A brochure explained that, “An arrow diagram is drawn which contains the work scheduling and work load alternative for all of the jobs underway in the shops. The diagram is translated into a computer program and processed by Hughes’ computer system. The computer then provides the information from which an efficient and expedited schedule is prepared…”²⁸ Through this program, assessment of tool wear and tear was to be done through statistical analysis and computer modeling, not through workers’ experience using the tools.

²⁷ These more labor-friendly documents sit in contrast to EXXON human resources texts from previous eras. Along with articles from the 1957 edition of *Supervision: The Magazine of Industrial Relations and Operating Management*, the folder also includes the 1948 *So You Want a Better Job*, by Paul W Boynton that advises readers to “not be communist” if they want company advancement. Folder ‘Human Resources: Education and Training Learning about Computers, Box 2.207/E33, Exxon Mobil Historical Collection, Briscoe Center for American History, University of Texas Austin, Texas.
²⁸ Howard Hughes’s Hughes Tool Company is one of the most famous oil tool innovators from this period. Hughes churned out thousands of his patented tri-cone rock bits, as well as drill pipe and tunneling machines for mining. Although the company was based in Houston, in the postwar era, Hughes Tool maintained a Dallas machine shop as well as a branch tool servicing plant in Midland. Folder, ‘Hughes Tool,’ Trade Literature Collection, Smithsonian Archives Center, Washington, D.C.
A similar deskilling process took place in the oil processing industry. As early as the 1950s, some refineries began using computers to monitor chemical reactions and to automate the transfer of liquids into different chemical baths. Computers increased the local popular prestige and industrial value of upper management engineers and facilitated the rise of computer scientists in the oil industry. However, by the 1970s it also led to the removal of less skilled positions and coincided with the industry-wide replacement of a largely salaried workforce with independent contractors.  

Hoping to prevent backlash, chemical companies initially attempted to reassure workers that automation saved employees from contact with hazardous materials and made jobs less physically challenging. Most often, companies combatted concerns about worker redundancy with reminders that the machines were not in control. The May 1959 edition of Petroleum Week reassures the oil industry’s middle management that “Electronics will take over many executive functions, but never supply leadership.” In 1965, TP Voice, the company magazine of the Texas and Pacific Oil Company, which operated several refineries in the Permian Basin, remanded readers that computers were

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29 Notes, Folder ‘Organizing Info,’ OCAWU Records, Special Collections, University of Colorado, Boulder, Colorado.
30 By the late 1960s, such protestations were very carefully worded as too much of an emphasis on worker exposure to chemicals would require admitting that chemical producers knowingly exposed employees to dangerous substances. Memos, Folder ‘Human Resources Health Services 1926-1928, 1951-1984,’ Box 2.207/E40, EXXON Mobil Historical Collection, Briscoe Center for American History, University of Texas, Austin, Texas.
impossible to use “without people.”

Despite these efforts, many workers were quick to identify the problems of deskilling and waning job security that such trends represented. Unlike oilfield workers, many Texas refinery and petrochemical employees were members of the OCAWU or other industrial unions. Throughout the postwar era, refinery and chemical workers pushed back against temporary labor contracts, decreased overtime pay, and a lack of health benefits. The OCAWU led the way in the renegotiation of contracts and, at times, in organizing strikes. These included the industry-wide strike in 1952, smaller strikes at refineries in the West Texas towns of Borger and Dumas in the late 1950s, and a national boycott of Shell Oil in 1962 and 1963. The Shell strike began along the Texas Gulf Coast, and spread quickly. Workers argued that automation would ultimately render the industry’s human workers redundant and pushed against the adoption of computers to manage and monitor production by chemical producers nationwide. Strikers threatened to shut down the majority of the nation’s refineries. Shell ultimately broke the strike and, in a reversal of the industry’s earlier conciliatory messages declaring that human workers were irreplaceable, heavily publicizing the fact that the company ran its newly automated plants without employees during the strike.

34 “Letter to Stockholders” and Press Releases, Folder ‘Human Resources, Labor Unions 1929-1977,’ Box 2.207/E40, EXXON Mobil Historical Collection, Briscoe Center for American History, University of Texas, Austin, Texas.
35 “Official Statement,” Folder ‘Human resources labor unions 1929-1977,’ Box 2.207/E40, Exxon Mobil Historical Collection, Briscoe Center for American History, University of Texas, Austin, Texas.
Although demoralized by these losses, Texas union agitation continued on an isolated basis throughout the late 1960s and 1970s. After a 1968 fuel oil deliverers strike failed, on Jan 4, 1969 the OCAWU began another national strike with approximately 60,000 refinery workers nationwide walking off the job.\footnote{The OCAWU also represented oil tanker drivers as well as refinery and gasoline plant workers. AP, “Fuel Oil Strike, Epidemic Of Flu Endanger New York Inhabitants,” \textit{Lubbock Avalanche-Journal}, December 19, 1968, Lubbock, Texas.; The OCAWU was asking for wage increases as well as improved working conditions. AP, “OCAW On Strike – Supervisory Personnel Operating Refineries,” \textit{The Odessa American}, January 6, 1969, 19.} Oil companies carefully ignored such demonstrations in official documents. Dismissing labor agitation, petrochemical companies carefully downplayed the importance of this workforce in industry periodicals and consumer publications. For example, in the centennial issues of the industry magazines \textit{Oil and Gas Journal} and \textit{The Petroleum Refiner} oil producers largely elided even the existence of wage workers when writing celebratory histories of the US oil industry.\footnote{\textit{Oil and Gas Journal: Anniversary Edition}, 1962.; \textit{The Petroleum Refiner: Oil Industry Centennial Issue}, 1959, Trade Literature Collection, Hagley Museum and Library, Wilmington, Delaware.} Instead, they featured oil companies’ corporate leadership and engineering laboratories. In these special issues, each containing over 300 pages of historical essays and advertisements, oil companies again and again emphasized their technological innovation and global connections, reminding readers that automated industry was vital to both American public defense and international diplomacy.\footnote{If only based on timing, this wave of strategic boosterism should also be seen as a response to yet another series of FTC monopoly investigations. Box 69, Harvey O’Conner Papers, Walter Reuther Library, Detroit, Michigan.}

Keeping with trends set in the 1950s, little debate about industry automation or information about this new wave of national strikes was published in the Permian Basin.
Neither appeared in the *Odessa American, Lubbock Avalanche, Abilene Reporter-News*, or company magazines during the 1960s or 1970s. While this inattention should partially be attributed to the Permian Basin’s perennial isolation and the region’s historically low participation in industrial unions, the completeness of this silence – with the strikes not even receiving negative coverage in the local press – also suggests at least some apprehension that granting attention to dissent would instigate local worker agitation.

During the late 1960s and throughout the 1970s the Permian Basin popular press focused on the ways in which increased federal regulation and bureaucracy hindered oil production instead of striking workers.

After the failure of the Shell general strike in 1963, the OCAWU largely shifted its efforts towards ameliorating workplace hazards for chemical and refinery workers, focusing in particular on long-term exposure to toxic chemicals while on the job. The OCAWU also began advocating for better environmental and public health standards across the energy industries. In 1968 the OCAWU launched a campaign to raise awareness about the hazards posed by gas pipelines beneath urban and residential areas.

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40 In 1969 there were only 180 union-represented refinery workers in West Texas and Eastern New Mexico. In contrast, approximately 20,000 workers were OCAWU members state-wide. AP, “Wage Dispute Idles Petroleum Workers,” *The Odessa American*, January 5, 1969, Odessa, Texas, 1.; AP “20,000 Texans Join in Walkout,” *Abilene Reporter-News*, January 5, 1969, Abilene, Texas, 13.

homes. The next year the union began a nationwide effort to establish stricter workplace health and safety laws.

This campaign was led by Tony Mazzocchi, then director of the OCAWU Health and Safety Office and who would go on to become the national OCAWU vice president. In 1969, Mazzocchi and Rockefeller University scientist Glen Paulson began a tour of North American oil locals, holding conferences in New Jersey, Kansas City, Atlanta, Houston, and other industrial centers to collect testimonies about health and safety issues at refineries and petrochemical plants. At these conferences, Mazzocchi and Paulson enlisted local public health experts to explain the consequences of chemical exposure to oil workers. They then took minutes at all-comers question and answer sessions documenting first-hand accounts of long-term exposure. According to Mazzocchi, “The value of this document is that in its vivid portrayal of the environmental problems of the workplace, it dramatizes the need for corrective steps on a massive scale.”

Until this period, acceptable worker exposure levels were regulated via a clause in the 1936 Wash Healy Act which set minimum safety standards for any company that received federal contracts. However, lack of enforcement hampered any meaningful protections and most day-to-day exposure guidelines were created through internal industry review and workplace consensus.

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43 “Foreword,” Oil Chemical and Atomic Workers International Union Conference Proceedings, Box 1, OCAW Tony Mazzocchi Collection, Special Collections, University of Colorado.

44 Wash Healy listed acceptable exposure levels for 450 chemicals but only maintained 50 inspectors for approximately 23 million US oil, chemical, and atomic workers. Tony Mazzochi, “Hazards in the Industrial Environment – a Conference,” Rice Hotel, Houston,
These hearings drew crowds of workers who came to ask about the known effects of particular chemicals. Citing a lack of regulatory standardization, OCAWU members expressed concern about the lack of public discussion of the long-term dangers of oil and chemical exposure. Several called for the union to enforce external safety testing and monitoring services at oil refineries.45

Mazzocchi and oil workers vividly described the health consequences of workplace chemical exposure. Mazzocchi was particularly concerned about long-term effects, “Hydrocarbons are not as bad as many things, because they are not chemically reactive. The thing that they can do is kind of dissolve the fats in the skin or in the tissue of the lungs and this is not good. But they don’t go in immediately and react and mess things up. As to whether there would be a synergistic interaction, to this there is no answer.”46 Because few formal studies existed, Mazzocchi used witness testimonies to illustrate long-term health hazards. Oil workers obliged, describing high rates of cancer, nervous system disorders, involuntary sterilization due to chemical exposure, poisonings, and a variety of catastrophic accidents in vivid terms.47 Harold Smith of Local 8-447 in New Jersey narrated:

And well, my father worked in a chemical plant right next door to the one I work for: about twenty year. [sic] He’s dead now. I had an uncle: he also worked in a

Texas February 20-21, 1970, 2, Box 1, Tony Mazzocchi Collection, OCAWU Records, Special Collections, University of Colorado, Boulder Colorado.
46 Ibid.
47 At the Salt Lake City conference Mazzococi discussed recent studies that showed that fifty percent of asbestos plant workers ultimately died of cancer. “District 2 Conference Proceedings,” Salt Lake City, Utah, 19; “District 3 Conference Proceedings,” Atlanta Georgia, 18, Box 1, OCAW Tony Mazzocchi Collection, Special Collections, University of Colorado, Boulder Colorado.
chemical plant: the same plant right next door to me. He died of cancer, this cancer in the throat. He had a tube in his throat and it was a result of working in this chemical plant: he didn’t have it before he went there. But a certain chemical that he inhaled got in his throat and his throat was a mess and he died. I mean, I don’t like the expression – he died like a dog.48

Similar testimonies came from Mazzocchi’s visit to Texas. Morris Aken director of OCAWU District 4 described workplace hazards on the Gulf:

…At a later date we had two or three people killed in the Mount Pleasant Refinery of American Petrochemical; there are no real safety precautions there. Then recently, we had an accident at the American Oil Refinery in Texas City, where some people were killed, including one young ambulance driver who was not working in the plant, but was trying to save some people.49

Such testimonies, taken from dozens of plants across the US and Canada, not only demonstrated understanding of the long-term consequences of working at refineries and petrochemical plants, they also articulated a growing belief that employers were directly responsible for employee health and safety. This was a dramatic reversal of the oil industry’s historic culture of assumed personal risk, masculine self-mastery, and inattention to the industry’s future consequences. This OCAWU position represents a national sea-change in heavy industry workplace culture in which employers were held responsible for preventing not only workplace accidents, but also for preventing long-term health consequences. Mazzocchi compiled a dossier of worker testimonials for use in a Congressional hearing before the Labor and Education Committee in 1968 with hopes to amend the Wash Healy Act. He advocated for more third-party plant inspections

48 Harold Smith, Local 8-447, Wood Ridge Chemical Corp, Quoted in “Foreword,” Oil Chemical and Atomic Workers International Union Conference Proceedings, Box 1, OCAW Tony Mazzocchi Collection, Special Collections, University of Colorado.
and more specific regulations for workplace health and safety. Ultimately, these efforts would lead to the establishment of the Occupational Safety and Health Administration (OSHA) in 1970.

The push to standardize chemical monitoring and exposure testing at chemical plants and refineries was helped along by the founding of the Environmental Protection Agency (EPA) in 1970. Over the course of the 1960s, environmental contamination had become an increasingly important issue in the popular press. In particular, the publication of Rachel Carson’s *Silent Spring* in 1962 launched the dangers of industrial chemicals into the popular consciousness. For the rest of the decade, discussions about industrialization’s consequences for animal and plant life coincided with growing concern for the country’s diminished air quality and contaminated rivers and oceans. Environmentalist backlash against the oil industry heated up in January of 1969 after a blowout on an offshore oil rig in the Santa Barbara Channel. Oil gushed for over a month, sending approximately 90,000 barrels of oil into the surrounding ocean. The spill received extensive media coverage and garnered intense public outrage toward oil producers, reigniting century-old accusations of destructive waste and negligent greed. Even the staunchly pro-oil *Odessa American* expressed dismay at the environmental

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50 The Wash Healy Act was a part of the NRA that stipulated that any company receiving more than $100,000 of federal contracts must provide overtime pay to its workers. The act was amended to include that companies must abide by certain minimum safety standards for workers. Charles Noble, *Liberalism at Work: The Rise and Fall of OSHA* (Philadelphia: Temple University Press, 1989).


52 “Brief Oil and Gas History of Santa Barbara County,” Energy Division, Santa Barbara County, http://www.sbcountyplanning.org/energy/information/history.asp.
destruction in Santa Barbara.\textsuperscript{53} While the newspaper focused on successful industry cleanup efforts, _

Official oil company statements addressing environmental preservations were, at best, vague assurances that increased accuracy and precision would mitigate excessive environmental damage. In contrast, the OCAWU linked worker health and safety issues to environmental destruction. During their worker safety campaign, Mazzocchi and Paulson directly connected the threat to human workers to environmental concerns. In a 1969 conference in Salt Lake City, Utah, Paulson asked refinery workers, “So the stuff you’re making is having an impact on the environment, as well as an attack on yourself?”\textsuperscript{54} The audience response to this pointed question is not recorded. However, it is clear that some workers connected the two issues. At a meeting with OCAWU Local 615 in Canada, a man name Mr. Shine made the following statement:

I feel that we are living in a crazy world. There is [sic] all kinds of problems and just a little business is done to try to cure those problems. A matter of fact, we’ve got the atomic bomb, we got the air pollution, the water pollution, which I’m afraid of. I’m afraid that one day the company will have so much money in their bank account, but there will be nobody in this world to spend the money.\textsuperscript{55}

In a speech before OCAWU District 4 in 1970 Dr. William Nicholson, expert witness for Mazzocchi and Paulson lamented, “I think this illustrates one of the problems of our society – that you have an industrial process which is instituted by industry and

\textsuperscript{53} While the staff writer expressed concern for the wildlife killed by the spill, he was also quick to congratulate the industry on quick cleanup efforts. “Beaches sparkle after Santa Barbara cleanup,” \textit{The Odessa American}, August, 25, 1969, Odessa, Texas.;

\textsuperscript{54} “District 2 Conference Proceedings,” Salt Lake City, Utah, Box 1, Tony Mazzocchi Collection, OCAW Records, Special Collections, University of Colorado, Boulder, Colorado.

\textsuperscript{55} Tony Mazzocchi, “OCAWU District 9 Conference Statement,” 23, Box 1, Tony Mazzocchi Collection, OCAW Records, Special Collections, University of Colorado, Boulder, Colorado.
people have to illustrate that it is harmful before it can be stopped. The alternative, where industry must show that something is harmless before it can be introduced into the environment, would be far more appropriate."  

Such future-oriented thinking would come slowly to oil industry management.

In 1969, OSHA officials began investigating the long-term impact of chemical exposure in the workplace. One year later, the EPA was founded. Over the course of the 1970s both organizations set new, stricter regulations for allowable chemical exposure at chemical plants, refineries, and on oil rigs. Both implemented more stringent industrial waste disposal procedures and set up testing and monitoring facilities for water and air pollution. In contrast to previous efforts at regulation in the 1920s and 1930s, which had focused on the preservation of an economically and strategically important resource, these rules explicitly mandated that oil companies work to mitigate the environmental impact of their actions. Between 1973 and 1980 the EPA developed over 50 federal Land Use Acts that had to be observed when drilling on public land. Regulations included stipulations for mitigating contamination to ground and surface water systems through oil runoff or subsurface intrusion, regulations about air contamination and animal habitat encroachment, and new quality control guidelines for gasoline and petrochemical

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56 William Nicholson was a former nuclear physicists working in the asbestos research center at Mt. Sinai Medical Center in New York. William Nicholson, District 4 Conference Proceedings, Houston TX, 1970, 10, Box 1, Tony Mazzocchi Collection, OCAW Records, Special Collections, University of Colorado, Boulder, Colorado.

57 In the legislation’s aftermath, complaints were lodged against oil companies across the nation, charging the oil and petrochemical industries with knowingly neglecting workplace safety. Tony Mazzocchi investigated many of these accusations. Box 1-10, Tony Mazzocchi Collection, OCAWU Records, Special Collections, University of Colorado, Boulder, Colorado.

58 Olien and Hinton, *Wildcatters*. 
production.\textsuperscript{59}

True to form, state governments in oil producing regions were reluctant to enforce these new regulations. Texas in particular had a long history of opposing federal intervention into the oil industry. Before 1970, most environmental legislation in Texas dealt exclusively with protecting the rights of private property holders to access natural resources such as water and oil. For example, in 1949 the Texas Legislature designated all groundwater to be private property. When Texas did create environmental protection legislation, the oil industry was often exempt. In 1953, the state created the Texas Water Pollution Control Advisory Council within the Texas Department of Health. However, the organization had little regulatory authority. Although the state passed the Injection Well Act in 1961 which regulated waste dumping into groundwater sources, it exempted the oil industry from all regulation. Such regulatory negligence frustrated industry workers. In a 1970 testimony, Bill Ricks, Secretary-Treasurer of OCAWU Local 4023 in Port, Arthur, Texas described his entire refinery crew walking off the job for hours at a time to avoid mass exposure to hydrogen sulfide released through refining sour crude.\textsuperscript{60} Hydrogen sulfide was known among workers to cause breathing problems and a quick loss of consciousness. However, management provided no air quality mitigation equipment, and state agencies did not enforce hazard regulations.

\textsuperscript{59} The most significant of these new regulations was the removal of tetraethyl lead from gasoline in 1976. “Addendum to Testimony of D. H. Clewell of Mobil Oil Corp. Before the Committee on Public Works of the U.S. Senate on Nov 5, 1973,” Folder ‘Government Relations Hearings and Testimonies Subcommittee on the Environment 1974,’ Box 2.207/E26A, Exxon Mobil Historical Collection, Briscoe Center for American History, University of Texas, Austin, Texas.

\textsuperscript{60} Bill Ricks, “District 4 Conference Proceedings,” Houston, Texas, 1970, Box 1, Tony Mazzocchi Collection, OCAWU Records, Special Collections, University of Colorado, Boulder, Colorado, 16-17.
The push and pull between new regulatory agencies and Texas oil companies was occasionally acknowledged in the Permian Basin press. Presumably at least in part due to the OCAWU’s refinery safety campaign, throughout the 1970s short descriptions of industrial accidents at the Odessa Petrochemical Plant began to appear in the *Odessa American*. In one case, the newspaper covered a lab explosion at the plant in which three people were hospitalized for chemical burns. While the paper was quick to point out that the victims had been airlifted to the hospital in an El Paso Products Co. plane, the simple fact that the accident was mentioned in the local news represented a sea change in Petrochemical Complex coverage.61 Similarly, articles discussing the Petrochem Plant’s annual awards for avoiding “maiming injuries” indicate internal company recognition of such agitation for worker safety. Connecting this new attention to the consequences of industrial growth to an emerging national environmentalist dialogue, in 1972 the paper ran a pair of articles documenting OCAWU calls for industry leaders to “pay attention to ecology” and included a proclamation by President Nixon to make industrial health and safety issues a top priority.62 However, such documentation did not represent a change in overall industry policy or public support for union efforts.

Between 1944 and 1986 the OCAWU opened a total of 81 case files in the Permian Basin. Of 45 recorded union elections only five were successful.63 None of the notes compiled by regional coordinator James Childs mention worker concern about

63 Case Files, Box 9, 21, 26-28, 32, 35, 37-38, 45, OCAW District 4 & 5, OCAWU Records, University of Colorado, Boulder, Colorado.
workplace hazards, though some reports hinted at rising tensions between workers and management. In 1968, the National Labor Relations Board (NLRB) found Odessa’s Rexall Chemical Plant to be in violation of the Fair Labor Standards Act for creating a preferential vacation plan for workers who declined to join a union.\textsuperscript{64} In 1970, employees at the Permian Corp of Midland won $2,563.90 in damages after several employees were fired for union membership.\textsuperscript{65} In 1978, PA Incorporated of Odessa was brought before the NLRB for offering higher wages to employees who agreed to leave the local union. In his notes, James Childs argued that the company coerced the plant’s largely Spanish speaking workforce to sign English-language documents declaring that they opposed a union.\textsuperscript{66} That same year, workers in a Pampa, Texas plant brought charges against Cabot Corporation accusing the company of poisoning union employees with arsenic.\textsuperscript{67}

A variety of factors, including management coercion, fear, greed, and blind complacency played a part in the lack of sustained outcry against workplace safety violations in the Permian Basin. At the same time, the region had a multigenerational history of stark individualism, masculine pride in adversity, and a workplace culture built around temporary employment. Industry boosters constantly tapped into imagery and iconography linking oil to the region’s cowboy past and reinforced the idea that land and nature existed as obstacles to be managed by increasingly complex oil technologies. Even

\textsuperscript{64} Folder ‘C4-935 Rexall Chemical Co Odessa Tex; “C” Charge Case No 16-CA-2952,’ Box 9, OCAW District 4 & 5, OCAWU Records, University of Colorado, Boulder, Colorado.


\textsuperscript{66} Folder ‘C4 - 510 PA Incorporated Odessa, Tex: 4-586 16-CA-8203,’ Box 21, OCAW District 4 & 5, OCAWU Records, University of Colorado, Boulder, Colorado.

\textsuperscript{67} Folder ‘04-814 Cabot Corp 16-RD-993,’ Box 38, OCAW District 4 & 5, OCAWU Records, University of Colorado, Boulder, Colorado.
further, in the early 1970s, as the country reeled from a national oil shortage and general economic crisis, the Permian Basin oil industry began a march toward the peak of its wealth and importance. Extraordinary profits, and the knowledge that other industries were experiencing sharp decline, made the majority of the region’s unfailingly pragmatic populace less than concerned about oil contamination.

Beginning in 1973, fears of foreign dependence resulted in a decade-long effort to roll back regulatory barriers on US oil production. In an effort to stimulate domestic exploration, Congress removed federal price caps that had been implemented to protect consumers and prevent the quick depletion of US oil reserves. In August 1973, Phase Four of the Economic Stabilization Act allowed oil prices to rise. To encourage renewed drilling, prices were allowed to increase much quicker on newly extracted oil, while the price of the existing above-ground oil supply was kept artificially lower. The Emergency Petroleum Allocation Act (EPAA) allowed the price of newly extracted oil to rise as high as $10.82 a barrel by December 1973. In 1976, the Energy Conservation and Production Act further deregulated oil prices, allowing certain categories of crude to reach over $14 per barrel. 68 In 1981, a newly elected Ronald Reagan fully deregulated the US crude oil market for the first time. Domestic crude prices quickly rose to $31.77 to match OPEC market prices. 69 The next year the Texas Railroad Commission upped allowable extraction quotas to one hundred percent.

69 This was the highest oil prices had ever been to that point, approximately $85.14 per barrel in 2017 dollars. For a more detailed history of this fallout see Meg Jacobs, Panic at the Pump: The Energy Crisis and the Transformation of American Politics in the 1970s
The boom produced by this deregulation lasted for a full decade, bringing the Permian Basin extreme wealth and tempered the push for environmental and public health reform. There were over 3,000 oil companies operating in the Permian Basin in 1973.\(^\text{70}\) Massive increases in company revenue, wages, and oil royalties muffled the debate about industry automation and offset the OCAWU’s very public conversations about workplace contamination and urban pollution, especially in the booming refining and petrochemical industries. While some oil workers in the Permian Basin participated in the OCAWU’s membership drives throughout the 1970s, union cards document that employees sought unionization hoping for better wages, not over any concern about workplace hazards.\(^\text{71}\)

The oil shortage spawned the quick expansion of regional oil processing operations. A directory of oil plants in West Texas compiled by the OCAWU demonstrated the proliferation of oil processing, refining, and petrochemical manufacturing operations both in urban centers as well as directly next to oil fields in some of the region’s most isolated areas.\(^\text{72}\) Industrial Odessa had thirteen plants, most part of the Petrochemical Plant complex located south of the city. In contrast, Midland, center for oil administration, had only four. Smaller towns such as Big Spring, Borger and Pampa all held four or more plants. These ranged from the Sid Richardson Carbon & Gasoline Co in Big Spring to the Phillips Petroleum Co Copolymer Plant in Borger.

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\(^{71}\) “TCEQ WST IHW 30142 Correspondence MF307609 1-16 (pre 1985),” Microfiche Archives, Texas Commission for Environmental Quality, Austin, Texas.

\(^{72}\) While there is no date on the document, adjacent text indicate that the list probably dates from the 1960s.
Other plants in smaller towns throughout the region produced fertilizers, sulfur products, and fiberglass, as well as gasoline, salt, and natural gas.\textsuperscript{73}

Comparisons between the 1966 and 1973 Permian Basin Oil Directories demonstrate the expanding geographic and economic scope of individual oil companies, allowing expanding Major control over oil processing operations. In 1966, El Paso Natural Gas Co maintained 37 refineries in 25 towns throughout the region. Similarly, Phillips owned 19 gasoline plants in towns strung across the desert. Pan American Petroleum owned 14, and the Cabot Corporation owned seven gas products plants.\textsuperscript{74} These numbers increased after 1973. The Odessa Petrochemical Plant underwent a series of expansions in the early 1970s. New companies moved in. AMOCO operated twelve plants, El Paso ran forty refineries, and Phillips owned seventeen gas plants in the region. These plants paid workers well. Median family income in Odessa doubled between 1970 and 1980. In 1980, Midland unemployment was at 1.9 percent.\textsuperscript{75} OCAWU records show starting wages as high as $11.00 per hour at Cabot Corp Carbon Black Plant in Pampa, Texas in 1983.\textsuperscript{76} High wages, coupled with a regional lack of other employment options, made workers in these plants dependent upon their oil jobs and largely uninterested in unionization.

\textsuperscript{73} “Business Directory,” Box 1, Tony Mazzocchi Collection, OCAWU Records, University of Colorado, Boulder, Colorado.
\textsuperscript{76} This would be $27.53 per hour in 2017 dollars. Folder ‘04-814 Cabot Corp 16-RD-993,’ OCAW District 4 & 5, OCAWU Records, Special Collections, University of Colorado, Boulder, Colorado.
Oil production in the Permian Basin increased over the next ten years, reaching its peak in 1980. However, the industry was deceptively precarious. Only the decade’s unusually high oil prices allowed oil companies to pay for expensive new leases, technologies, and equipment. It was only the sudden extraction boom that allowed regional employment to rise even as the number of workers needed per drilling job went down. Further, the national oil shortage delayed OSHA or EPA actions against the industry, postponing fines, citations, and administrative oversight. Expanded refineries and petrochemical plants propped up a network of small towns, such as Crane, Kermit, Andrews, and Denver City, with populations between 1,000 and 5,000 people. With even small refineries and gasoline plants employing 35 people on average, they were major employers, singularly dependent upon ever-increasing regional extraction rates. Industrialization and automation made more and more small town residents into technicians, dependent upon the fate of a single oil company.

Wealth coupled with growing insecurity helps to explain the industry’s preoccupation with preserving a particular version of the region’s pre-petroleum, cowboy past. Oil companies, Odessa and Midland Chambers of Commerce, and Permian Basin politicians linked expanding oil production to a nostalgic fantasy of rugged autonomy and

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77 In 1970 Odessa Products Co. branched out into oil exploration and extraction, “Subsidiary of Products Firm Formed,” The Odessa American, September 25, 1970, Odessa, Texas, 11.

78 Isolation, lack of economic alternatives, and lack of personal savings helped to make rural refining communities very dependent on these industries in the 1980s. For more on this structure see. Ann R. Tickamyer and Cynthia M. Duncan, “Poverty and Opportunity Structure in Rural America,” Annual Review of Sociology, 16 (1990) 67-86.; This increasing dependence was connected to consolidation in agricultural and farm production which contracted US the rural economy and increased migration to urban centers and into industrial jobs. Barry J. Barnett, “The U.S. Farm Financial Crisis of the 1980s,” Agricultural History, 74:2 (Spring 2000) 366-380.
human industry conducted in opposition to awe-inspiring, natural forces. Owning a West Texas ranch was a symbol of wealth and prestige among management personnel and oil industry CEOs. Several of Texas’ largest oil fortunes maintained residences in Midland and owned ranches in the surrounding area. In 1974 Clayton Williams of Midland made it big in oil, immediately buying a 183,000 acre ranch that bisected Borden, Brewster, Jeff Davis, Pecos, and Presidio counties. Similarly, wealthy oil driller John Lee Cox became regionally famous as the “Sprayberry King” due to his many discoveries in the Sprayberry-Dean field during the late 1970s. Along with a primary residence in Midland, Cox owned a 70,000-acre ranch in West Texas.

The desire to own ranchland extended throughout the industry ranks. With regional drilling on the rise, ranches were investments. But they also were displays of wealth, control, and belonging. New money was funneled into the region’s oldest ranches such as the La Escalera and Reynolds Family Ranches, both founded in 1884.79 The 6666 Ranch, founded by Samuel “Burk” Burnett in the Panhandle and the 825,000 acre King Ranch in South Texas were both founded with oil money. The connection between oil and ranching was central to local business culture. This is epitomized by the Odessa Chuck Wagon Gang, a service organization within the Odessa Chamber of Commerce that promoted West Texas industry by traveling across North America serving beans and barbecue from a horse drawn wagon. Kitchy lingo filled the organization’s press releases. The president was a “Gang Boss” who held a “whip” of office. The organization

administered the “Wagon Master” Award for public service.80

A belief that the Permian Basin was a unique crucible defined by its rugged geography and cowboy past was as old as Texas statehood. Independent oil drillers saw themselves as the inheritors of this legacy and revived such associations as their industry control eroded after World War II. A 1992 article describing the landholdings of the 100 richest people in Texas revealed a laundry list of large West Texas properties. Clarence Scharbauer, Jr., of the Scharbauer ranching family maintained the Scharbauer ranch in West Texas. Independent drillers Jack Eugene Brown and Cyril Wagner also made their money in West Texas oil. After working at a Midland oil drilling firm, they partnered up in 1962 as independent oil and gas producers. Ralph Lowe was a transplant to the region, and made his millions drilling for oil in Permian Basin. Lowe also settled in Midland and bought several ranches.81

Buying ranchland was a way of assimilating for both wealthy industry elites and for oil companies. By the late 1950s, such connections became so ubiquitous they were the subject of comedy. Cleveland Amory of Holiday Magazine paraphrased a stereotypical Texas oilman, “Mah name…is James R. Robinson, and mah nickname is Jimmy. Ah have a ten-thousand-acre ranch in the Panhandle, and mah brand is Jr…. Ah have a ten-thousand-dollar baby-blue Cadillac outside, and on it, in gold, are mah initials,

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Despite such mockery, this symbiotic connection between oil, ranching, and West Texas culture was consciously perpetuated in industry publications and iconography throughout the 1970s. Visiting CEOs acquired the requisite Stetson hat and Tony Lama boots for local photo opportunities. Advertising for oil tools and oil services depicted longhorn cattle standing in front of bobbing pumpjacks and hulking refineries. Ranches were both conspicuous symbols of disposable wealth and tangible connections to Texas’ historic, cattle baron elite.

Using animal husbandry to solidify a connection to an imagined past and nonexistent “wild west,” these ranches boosted the egos of oil millionaires. But they were also sources of employment and community cohesion in rapidly changing times. Local press coverage celebrating the US bicentennial developed the connection most explicitly, pairing nostalgia for the region’s rugged, isolated past with a dose of sex and violence. In an article describing the Anglo settlement of Mitchell County, San Angelo Standard Times Special Correspondent Tom Jay Goss II remarked that in the nineteenth century

82 “The Oil Folks at Home,” Cleveland Amory, Holiday, February 1957, Texas Oil Scrapbooks Collection, Briscoe Center for American History, University of Texas, Austin, Texas.


84 Cover and H. S. M. Burns, “The Industry Meets the Challenge,” South Texas Blowout, December 3-4, 36, Texas Oil Scrapbooks, Briscoe Center for American History, University of Texas, Austin, Texas. The 1951 cover of the Magnolia News depicted a stand of prickly pear cactus in the foreground, with a looming derrick sitting tall on the horizon. The caption read “Forty Years of Service to the Southwest.” The Magnolia News, Magnolia Oil Company, 1951, cover, Texas Oil Scrapbooks, Briscoe Center for American History, University of Texas, Austin, Texas. In another example, the Oil Centennial Issue of contains an image of wealthy oilmen riding horses on private ranchland, presumably about to board the prop plane in the background. Harold M. Fleming, “A Market Where Nobody Rules the Roost,” American Petroleum Institute Quarterly, American Petroleum institute, 1959, 62, Texas Oil Scrapbooks, Briscoe Center for American History, University of Texas, Austin, Texas.
Colorado City, “boasted one of the finer red light districts west of Fort Worth. “Colorado” allowed sin to pay its cost of government by regularly fining gamblers and madams enough to pay its governmental expenses.”85 A similar article by Marjorie Gallion bluntly described Crane County’s first murder as an argument between two cooks in which, “The loser, a Filipino, staggered out to the sidewalk with an ice pick in his chest.” Gallion went on to describe the county’s geography and congratulated the hardiest ranchers for staying, “Looking out across the sun-baked, mesquite-covered terrain, one can’t help but wonder what induced the first settlers to remain in Crane County. They had to be a special breed of people to have borne the hardships of this rugged, desolate area.”86

Taken together, these efforts called to mind an earlier time when the oil industry was unencumbered by intrusive regulation, machines were subservient to humans, and individuals were free to make a fortune in the desert. Wealthy oil independents actively worked to shore up the region’s declining cowboy culture by sponsoring museums, historical events, and memorials honoring the industry.87 Local oil driller and Midland civic leader George T. Abell started the Abell-Hanger Foundation, which funded the completion of a regional industry history in 1973.88 The Scharbauer family started the original First National Bank of Midland, donated the land to build Midland Airport, founded Midland Memorial Hospital, and established the radio station KCRS.89

87 The building of the Petroleum Museum coincided with a wave of oral history projects sponsored by the University of Texas at Austin and the College of the Permian Basin. Folklorists descended upon representatives of a culture they perceived to be dying out.
88 Myres, The Permian Basin, xi.
89 Other philanthropic efforts included provided land for a community sports complex,
An array of wealthy Midland/Odessa donors worked with the Abell-Hagner Foundation and the industry alumni organization Permian Basin Petroleum Pioneers to fund the building of a Permian Basin Petroleum Museum and Hall of Fame. After a municipal bond issue and a public donation drive, construction began in 1971. The museum would celebrate the industry’s early history. According to the museum’s official history, “Special attention [was] given to the men who, operating within the free-enterprise system, had helped to make the industry grow.” This interpretation self-consciously valorized the imagined, individualistic – always white – cowboy as the paragon of regional masculinity and success.


Myres, The Permian Basin, xxiv.

and a deep industry connection to regional culture. This multi-day industry festival coupled futurism with cowboy nostalgia.\textsuperscript{92} Such a combination directly contradicted graphic OCAWU testimonies of worker injury and death and the slow replacement of deskilled workers with computer systems. Historian Richard B. Wright identified West Texas residents as “clear-eyed and unsentimental.”\textsuperscript{93} However, only sentiment can explain this cowboy nostalgia.

This perspective demonstrates a stark divide between the opinions of people in oil communities nation-wide and American oil consumers. The oil shortage was deeply felt by most Americans through long lines at the gas pump and price hikes on oil, gasoline, and petrochemical products.\textsuperscript{94} Stories of fistfights over depleted gas stations and families left unable to pay their heating bills dominated the national news, further damaging to the oil industry’s public reputation. While some theorized that large oil companies orchestrated the oil shortage to increase profits, others returned to earlier images of oil robber barons and exploitative waste.\textsuperscript{95} For these authors, wealthy oil tycoons’ penchant for buying ranches and self-aggrandizing philanthropy represented excess in a time of national austerity.

\textsuperscript{92} These themes were echoed in national celebrations still organized each year by the API. Photos of marching bands spelling the names of oil companies and photos of local Oil Progress Week celebrations were common. Photos, Box 69 Collection, 711, API Photo and Film Collection, Smithsonian Archives Center, Washington, D.C. The Oil Hall at the National Museum of American History was designed largely by the API and held a similar mix. Photos, Box 70, Collection 711, API Photo and Film Collection, Smithsonian Archives Center, Washington, D.C..

\textsuperscript{93} Richard Wright, “The Urban Centers of West Texas,” in Glasrund, West Texas, 161.


\textsuperscript{95} News Clippings, Folder, ‘Cost Benefit Articles and Publications,’ Box 5.; Folder ‘Oil Imperialism Study,’ Box 6, Tony Mazzocchi Collection, OCAWU Records, Special Collections, University of Colorado, Boulder, Colorado.
Such excess did intentionally elide a national preoccupation with energy overuse and energy depletion that dominated public rhetoric in the late 1970s. For example, a seemingly optimistic 1977 television special titled “Dateline 2000: America Ready for Tomorrow” attempted to reassure the public that offshore drilling would prevent US dependence on foreign oil and put an end to the energy crisis. After a discussion of the increasing number of people who were building homes underground to save on heating and cooling costs, a discussion of new small gadgets, including a prototype television remote, the host felt compelled to reassure customers that the potential energy cost was not prohibitive in new household technologies.⁹⁶ Stories of Texas-sized oil estates, garages filled with multiple Cadillacs, and gratuitous spending made oil producers seem woefully out of touch.⁹⁷

Major oil companies responded to their critics using tried-and-true weapons. Oil boosters launched a new wave of publications designed to demonstrate industry control over the extraction process and reassure both employees and the general public that temperate scientists had made the industry safer and more predictable. While some company publications, such as TP Voice returned to the narratives of one big “corporate family” that had been common in the 1950s and 1960s, the API created a vast archive of aerial photography to serve as public relations images. These images emphasized the industry’s stability and limited environmental impact. In photographs of West Texas, wells were evenly spaced, each with its own paved road. Christmas trees, tanks, farms,

and storage facilities were clean and orderly, carefully locked away behind fences and appropriate signage. The API used such images to demonstrate the industry’s ability to regulate itself and to provide for the oil-starved American public. In other photos, vast fields of oil products sat ready to go to market. Tanker trains moved through space in an orderly fashion. The caption on one indicative photo compares the “hurly burly” fields of the past in contrast to the “modern well spaced fields” of the present. According to the API, in the process of delving for what was below ground, humans had achieved ultimate mastery over the land above.

Oil companies were less adept at addressing new environmental concerns. In response to accusations of waste, the petrochemical industry prompted investigations into the amount of energy used in plastics production, producing documents like “Plastics the Energy Saver” which compared the energy used to produce both plastics and nonplastic home goods. The pamphlet argued that because so much energy was expended to produce useable raw materials from wood or animal fibers, plastic replacements represented significant environmental savings. Similar sentiments were expressed in a 1971 report from the Mobil Oil Chemical Company Plastics Division which promoted plastics consumption as environmentally friendly, “Because they do not rot, plastics will not

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98 *TP Voice*, Texas and Pacific Oil Company, 1965-1976, Trade Literature Collection, Hagley Museum and Library, Wilmington, Delaware.; Box 40, Coll 711, API Photo and Film Collection, Smithsonian Archives Center, Washington, D.C..
99 Photos, Box 69, Collection 711, API Photo and Film Collection, Smithsonian Archives Center, Washington, D.C..
100 Press Release, Trade Literature Collection, Smithsonian Archives Center, Washington, D.C.; Pamphlets, Folder ‘Mobil corporation: subject files: affiliates: Mobil Chemical Company Plastics Division 1961-1988,’ Box 2.207/F122, Exxon Mobil Historical Collection, Briscoe Center for American History, University of Texas, Austin, Texas.
release undesirable products of decomposition that can foul the air or contaminate ground waters. They do not contribute to settling, a problem that limits future uses of landfill sites.”

Such ads sidestepped the question of environmental contamination in favor of the more easily addressed issues of waste and efficiency.

Throughout the 1970s, the Permian Basin regional press continued to spout a well-trodden narrative that technology would breed further community development and ensure efficient and profitable oil extraction. Narratives about oil technologies and oil science overcoming nature merged with older stories of individual oil prospectors using only their wits to find oil and fuel modernity. Such sentiments appeared in nostalgic op-eds lamenting the end of “real” cowboy culture. Elaborate public displays unambiguously reiterated a belief that the oil industry’s corporate interests aligned with the needs of the local community and that any opposition or critique was both unnecessary and damaging. However, when placed within the broader context of post-oil-crisis America, in which national oil worker unionization efforts, growing fears about an American energy shortage, and national attention to the environmental consequences of heavy industry directly contradicted such language, it is possible to see desperation lying behind this rhetorical overkill. If everyone in the Permian Basin was so uniformly opposed to unionization and corporate oil was unilaterally seen as beneficial to the community, why the need for perpetual reinforcement?

101 Mobil Report, 1971, Folder ‘Mobil corporation: subject files: affiliates: Mobil Chemical Company Plastics Division 1961-1988,’ Box 2.207/F122, Exxon Mobil Historical Collection, Briscoe Center for American History, University of Texas, Austin, Texas.
Nostalgia for an earlier era of unregulated freedom and individual autonomy probably made some Permian Basin residents feel better. However, state regulators and oil companies continued disregard for environmental contamination caused increasingly toxic problems for residents. In 1970, the Texas Water Commission began formally investigating the toxicity of Permian Basin groundwater. OSHA and the EPA extensively documented gas leaks, groundwater contamination, and air pollution in oil producing communities throughout the region. For example, L. P. Ashton of Cactus, in far Northwest Texas, described watery eyes, coughing, and constant worker absences due to exposure to ammonia fumes. In 1975, seventeen people were killed by an oil pipeline hydrogen sulfide leak in Crane County, Texas. In 1977, a group of undisclosed former employees began a lawsuit against the Odessa Petrochemical Plant citing long-term damage to their health. The apathetic local reaction to these highly publicized scandals demonstrated how strongly local perspectives differed from national opinion.

On the night of February 1, 1975, a pipeline transporting natural gas for an experimental well injection system in Crane County leaked a small amount of hydrogen sulfide gas into the air, killing over seventeen people and an undocumented number of cattle, horses, dogs, cats, and other animals near Denver City, Texas. The majority of those killed were farmers and their families, caught asleep in their beds and unaware of the spreading gas. The June 1975 edition of *Texas Monthly* vividly described the scene as the local sheriff found the Patton family the next morning:

> Seven bodies, most of them wearing only bed clothes, were found in a car and a pickup beside the house. Another man was lying in the rainy red ooze outdoors. Dead were seven members of the Patton family who had assembled [sic] for a

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weekend family reunion—husband, wife, seventeen-year-old daughter and her overnight guest, and Mrs. Patton’s mother and sister and their husbands. Inside the house, beds were rumpled and furniture overturned. Everything indicated a frantic, futile flight for safety. Searchers looking for other victims found scenes reminiscent of a science fiction film. The same silent, unseen killer that had stalked nine persons also left lifeless bodies of coyotes, chickens, rabbits, birds, dogs, cats, even a donkey, littered in a wide kill zone around the house.  

Atlantic Richfield (ARCO), the owner of the well injection system that released the deadly gas, conducted an investigation in conjunction with the Texas Department of Public Safety, determining that the injection well contained 95 percent carbon dioxide, four percent hydrogen sulfide, and one percent miscellaneous gases. Four percent was more than enough to kill.

Hydrogen sulfide poisoning was a decades-old problem throughout the Permian Basin. Stories of sulfur gas blowing across oil camps and incapacitating, blinding, or killing workers were common in oral histories taken throughout Texas. The region’s sour crude regularly leaked the deadly gas. In the 1920s and 1930s, depending upon the direction of the wind, gasses from gushers would blow across oil camps, causing people to pass out. In oral histories, workers vividly remembered running from the rotten-egg smell that signaled creeping gas. In the 1920s oil workers were known to rig up makeshift sulfur gas warning systems made of linked strings of bells and steam whistles.

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105 Frank Hamilton, interview by Mody Boatright, July 29, 1952, Sour Lake, Texas, Oral History of the Texas Oil Industry Collection, Briscoe Center for American History, University of Texas, Austin, Texas.
However, as the 1975 tragedy demonstrated, once detected there was only a small window of time between smelling gas and complete incapacitation.

In 1970, at an OCAWU public health seminar in Houston, Texas, an unnamed refinery worker asked Glen Paulson of the OCAWU to describe the acceptable levels of exposure to hydrogen sulfide. The worker was concerned about regular exposure to hydrogen sulfide while working with sour crude at a Gulf Coast oil refinery. Paulson defined hydrogen sulfide as a slow numbing agent which, “can reach such levels that it actually acts as a general nervous-system poison and kills somebody, usually by stopping his breathing.” Paulson linked long term, low level exposure to chronic lung diseases, especially emphysema. He also discussed the common practice of burning off hydrogen sulfide waste at refineries and pointed out that this practice created large amounts of sulfur dioxide, which was a common, deadly urban air pollutant.

In the end, OSHA fined ARCO just $1,125 for inadequately training its employees about the dangers of hydrogen sulfide, poor employee respiratory equipment, and insufficient monitoring gear. While no charges were brought against ARCO for the civilian deaths, members of the Patton family sued the company for one million dollars. After a public outcry, the Texas Railroad Commission went on to enact Statewide Rule 36 which required oil companies to install equipment to prevent hydrogen sulfide leaks on

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107 This was a global problem. The most famous case of urban sulfur dioxide poisoning was the great London Smog of 1952 that killed 12,000 people. Michelle L. Bell, and Devra Lee Davis, “Reassessment of the Lethal London Fog of 1952: Novel Indicators of Acute and Chronic Consequences of Acute Exposure to Air Pollution,” Environmental Health Perspectives, 109, 2001, 389-94.
all wells and to provide warnings about the dangers of gas leaks to residents living near gas wells. Although this tragedy received statewide news coverage, and although it represented a rare example of Texas state intervention into oilfield practice, the local press was largely silent. *Texas Monthly* interviews with Permian Basin residents indicated general ambivalence. One woman explained, “My husband used to work for the oil company and we’ve still got relatives who do,” she said, “They’ve been good to us and, well, that’s our livelihood. But at the same time, we sure do hate to think of what happened to those folks in Denver City.”

Such ambivalence reflected loyalty to the industry and an assumption that individual residents knew the risks and therefore accepted the consequences of oil production.

Members of the industry were particularly worried about further regulatory action. According to *Texas Monthly*, at a Texas Railroad Commission meeting discussing the dangers of hydrogen sulfide one administrator remarked, “My God, [we] already had OSHA inspectors looking over [our] shoulders at every move.”

According to *Odessa American* op-eds, most locals accepted hydrogen sulfide exposure as an acceptable industry risk. W. C. Faulkner, Odessa businessman and former oilfield worker argued that “The situation just isn’t that dangerous and a man just doesn’t get gassed too often because you learn to respect it.”

Similarly, according to the Texas Railroad Commission, the Permian Basin was one of the state’s largest producers of “sour gas”

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109 Ibid.
and the dangers of hydrogen sulfide gas were well known and sufficiently documented.  

A regional consensus that individuals, not corporations or regulatory agencies, were responsible for their own lives was further exemplified by the local non-reaction to environmental contamination at the much-lauded Odessa Petrochemical Plant. The plant’s history of pollution was relatively well documented. Although little pollution remittance equipment would have been in use before the 1970s, during the 1950s and 1960s the Texas Water Commission did conduct regular groundwater inspections at the Odessa Plant. Plant operators sent regular reports of chemical spills, water, and air contamination to state regulators. However, although these records provide historians with a working summary of plant pollutants, the Water Commission issued few violation notices and fewer fines. Soon after the establishment of the EPA, Texas state regulators documented crude oil and other chemicals from the Odessa Petrochemical Plant in the city water supply and high levels of chemicals in the nearby stream, Monahans Draw.

With hindsight, in the 1980s, these inspection reports were used to determine the extent of the plant’s issues and resulted in the first pollution remediation efforts. Records from the Texas Commission for Environmental Quality (TCEQ) – the successor to the Texas Water Commission – revealed the most common types of contamination in the Odessa neighborhoods closest to the plant. The steam cracking process that separated natural gas into its component parts produced an incredible amount of air pollution.


\[112\] “TCEQ WST IHW Correspondence MF307389 1992 1-3,” Microfiche, Archives, Texas Commission for Environmental Quality, Austin, Texas.
Without vapor recovery systems, regular-burn offs of waste products and scheduled steam pressure releases dispersed chemicals, including large amounts of sulfur dioxide, into the air. The majority of the plant’s crude oil and additive chemicals were stored throughout the property in dozens of large steel storage tanks anywhere from twenty to fifty feet high. Tank leaks due to rust and corrosion as well as chemical spills from hoses, valves, or from broken oil drums were common. While smaller spills often went undocumented, TCEQ records show several occasions in which thousands of gallons of toxic waste were simply absorbed into the ground.\footnote{113}

Petrochemical production required millions of gallons of groundwater. When the plant was first opened, W. D. Noel and other boosters praised the plant for using untreated city wastewater, as opposed to potable groundwater, in the refining process. However, this wastewater was made permanently hazardous through use in petrochemical production. Water contaminated with styrene, ethylbenzene, arsenic, lead, and other chemicals was expelled into unlined concrete tailing ponds or into underground ejection wells below the plant. Not only did this contribute to the depletion of the region’s limited drinking water, such haphazard disposal leached chemicals into the soil and into the rest of the groundwater supply.\footnote{114} Correspondence between plant management and state regulators during the 1960s reveals that industry leaders and state

\footnote{113} “TCEQ WST IHW 30142 Reports MF307604 Closure Plan for Facility 20 1-1,” Microfiche, Archives, Texas Commission for Environmental Quality, Austin, Texas.
\footnote{114} For example see “Closure Plan for Facility 7, TCEQ WST IHW 30142 Reports MF307600 1988,” and “TCEQ WST IHW 30142 Reports MF307603 Closure Plan for Facility 16 1-1,” Microfiche, Archives, Texas Commission for Environmental Quality, Austin, Texas.
officials had a working knowledge of some of these hazards. In particular, regulators knew of chronic water contamination in wells near the plant and crude oil in the city water supply. Beginning in the 1980s, EPA, OSHA, and state regulators discovered high levels of air and water contamination in majority-minority, South-Central Odessa neighborhoods, nearest to the plant.

While such evidence reveals disregard for the people living near the Petrochemical Complex, it does not mean that plant managers or regulators were necessarily doing anything illegal. Expert witnesses for the OCAWU argued that federal regulatory standards for water contamination before 1970 were negligently lax. In particular, Rockefeller University professor Glen Paulson argued that federal allowable ingestion amounts for xylene, toluene, and benzene were too high. Xylene was known to cause “mild anemia and some enlargement of the liver” with prolonged exposure. However, inhaling large amount of xylene caused some injury to the kidneys, liver, and bone marrow. Toluene exposure caused fatigue, insomnia, and nervous system impairment in higher doses. Benzene was significantly more toxic. Paulson explained, “Acute benzene poisoning is fatal anesthesia, and chronic poisoning is primarily injury to the bone marrow.” Skin exposure to benzene resulted in rashes and the removal of the fats from the skin. According to Paulson this created a, “very gross chemical change in the structure of the skin.” At OCAWU hearings, workers at refineries along the Gulf described a variety of rashes due to splashes from benzene as they moved drums or

115 “TCEQ WST IHW 30142 Correspondence MF307558 (pre 1980) 1-3,” Microfiche, Archives, Texas Commission for Environmental Quality, Austin, Texas.
pumped benzene to and from storage tanks.

In the late 1970s, the EPA began new investigations into the long-term hazards posed by exposure to the most common petrochemicals. In 1978, the EPA published a series of revised exposure recommendations for industry regulators and employers. These recommendations designated many of the Odessa Petrochemical Plant’s most commonly used materials as highly toxic. The EPA described butadiene as particularly toxic when airborne and more toxic than formaldehyde when ingested.\textsuperscript{117} A 1980 EPA report on the toxicity of styrene and ethylbenzine found that both could become easily vaporized and travel airborne long distances. National epidemiological analysis of chemical plant workers linked styrene and ethylbenzine exposure to permanent nervous system and reproductive disorders.\textsuperscript{118}

The public nature of these documents, coupled with the OCAWU’s vocal and explicit testimonies during the OSHA campaigns of 1968 and 1969, make it clear that by the mid 1970s it was widely known within industry regulatory circles that the type of contamination documented at the Odessa plant was immediately hazardous to both workers and neighboring residents. However, neither federal, state nor plant officials took significant action to mitigate pollution at the Odessa Petrochemical Plant. Analysis of TCEQ inspection reports reveal that violations resulted in letters to the plant management. Sometimes these included a fine. Despite reporting consistent and


significant water quality violations throughout the 1970s, the TCEQ issued the plant a new operation permit each year.119

Almost no discussion of petrochemical toxicity appeared in the largest regional newspapers.120 During the 1970s, there was scant reference to either OSHA regulations or EPA research in the *Odessa American*. There was no mention of local chemical exposure, environmental contamination, or the nation-wide dialogue about the industry’s long-term effects on employee health. Local elites seemed generally uninterested in hearing about pollution caused by the industry that sustained them.

However, reports of employee lawsuits evidenced at least some public awareness of escalating hazards. In 1977, *The Odessa American* recorded that a group of undisclosed parties began a $300,000 lawsuit against El Paso Products Co., seeking damages for health problems caused by long-term exposure to toxic chemicals at the plant.121 In 1981, *Odessa American* reporter Pat Weir contacted the Texas Water Commission after receiving several phone calls from an anonymous source claiming to work at the Odessa Petrochemical Plant. In a letter to Weir, this source expressed concern about the plant’s negligent water treatment practices saying, “Know this though, they

119 “TCEQ WST IHW 30142 Correspondence MF307609 1-16 (pre 1985),” Microfiche, Archives, Texas Commission for Environmental Quality, Austin, Texas.
120 “TCEQ WST IHW 30142 Inspection Report MF307610 5-6” and “TCEQ WST IHW 30142 Correspondence MF307609 1-16 (pre 1985),” Microfiche, Archives, Texas Commission for Environmental Quality, Austin, Texas.; All issues of the *Odessa American*, *Abilene Reporter-News*, and *Lubbock Avalanche* are archived in the searchable online database, Newspapers.com. In-text searches for information about the plant indicate that there was not a mainstream public discussion about contamination.
121 That same year, the OCAWU held yet another failed union drive at the Odessa Petrochemical Complex, this time working to organize employees of Rexene Polymers. Folder ‘04-661 Rexene Polymers Odessa, Texas,’ Box 26, OCAW District 4 & 5, OCAWU Records, Special Collections, University of Colorado, Boulder, Colorado.
know what they are doing but after reading my letter so will you.” The source accused the plant of contaminating local groundwater with massive amounts of benzene, non-sulfur inhibitor (N.S.I.) and other chemicals. A 1983 memo from Environmental Quality Specialist Gary Raven to Robert Fleming, Director of Enforcement at TCEQ, revealed that the Water Commission only reluctantly followed up on these accusations. Raven had been assigned to the case in 1982 after the abrupt resignation of Robert Bradshaw, the agent assigned to the case the year before. After conducting tests of the water table near the plant, two years after the original complaint, the Water Commission found no such hazards in the local groundwater and recommended further monitoring. 122 Although the letter’s ominous tone suggested the discovery of a massive internal scandal, the Water Commission ultimately found no violations and Pat Weir never published his investigation.

Public inattention to both sulfur dioxide deaths and petrochemical contamination does not mean that oil workers were unaware of industry hazards or that they had blind faith in oil companies’ benevolent intentions. Oral history interviews with oilfield workers in the 1970s reveal that the region’s working class white population was more pragmatic. They expressed a mix of pride in the Permian Basin’s regional importance as part of a globally significant industry and hoped that further technological development would prevent oil depletion and save the region’s oil communities. 123 Others, boosted by high wages and living in neighborhoods removed from the worst sources of industry

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122 “TCEQ WST IHW Correspondence MF307608 8 of 16_0000,” Microfiche, Archive, Texas Commission for Environmental Quality, Austin, Texas.
contamination, were reluctant to entertain critiques by outsiders who they believed had little understanding of industry culture or regional politics. In the wake of contamination scandals, increasing government regulation, and growing industry control by large companies, the industry’s cowboy imagery – although increasingly divorced from reality – shored up workers’ threatened pride. Even more importantly, connections between 1970s oil workers and mythical 1880s cowboys provided a sense of individual autonomy that allowed employees to feel that they had a hand in shaping the future of the industry. In 1975, Texas Monthly tapped into these associations in an article describing Odessa and Midland:

From any decent distance these lonely sisters of the barren flat plain, these isolated twin mini-cities of the vast Permian Basin—Midland and Odessa—appear more alike than not. Their differences may seem paltry or superficial or not to exist at all to the visitor blasting across Interstate 10 toward Fort Worth or El Paso, for there is a peapod sameness—a tuneless monotony of brown land and anemic blue sky—in these baked badlands where often the wind grows angry and spits hot sand.

Such words echoed both the earliest Anglo descriptions of the region and hyperbolic booster literature of the 1920s and 1930s. They also echo 1970s local historians and industry boosters who saw the region as a holdout of extreme rugged individualism in an era of increasing regulation and unwanted, outsider control.

During the late 1970s, the popular press proudly touted industry expansion to reassure locals that oil production would continue to grow in the face of constant opposition. On October 17, 1976 an ad in the Odessa American for the Odessa Oil Show

pleaded with readers to “support the oil industry, it supports all of us.”\textsuperscript{126} Other \textit{Odessa American} articles, while similar to those in the 1950s and 1960s, were shrill in their industry support. One article spouted frenzied praise for the Odessa Petrochemical Complex:

   So now just two miles south of town is a multi-million dollar complex, considered to be one of the largest inland complexes in the United States today, all of which started as a dream back in the early 1950s and resulted from a lot of hard work in the ensuing years by the companies involved and the invaluable help and cooperation of the people of Odessa.\textsuperscript{127}

This narrative connected the petrochemical complex to community stability even as it elevated the “people of Odessa” to the role of helpers on the plant’s larger journey. Here the plant became a conscious entity, anthropomorphized and acting independently to help the community and the nation out of economic doldrums.

   In 1977 another article remarked, “The complex is ever expanding, seeking for new markets and new techniques. The $300 million plus complex is symbolic of new science that is changing the American way of life.”\textsuperscript{128} These rhetorical connections between the industry and the community are important. In the late 1970s, the local Permian Basin press parroted copy from early 1950s booster literature, demonstrating an inability to see beyond technological progress based in a single industry, even in the face of public health problems and a looming economic crisis. Constant reassurance from politicians and civic leaders, engineers and plant managers, advertising campaigns and

\begin{footnotesize}
\begin{enumerate}
\item \textsuperscript{126} “Support the Oil Industry….” \textit{Odessa American}, Odessa, Texas, October 17, 1976, Odessa, Texas, 148.
\item \textsuperscript{127} “Joint Venture in Complex Started Eight Years Ago,” \textit{Odessa American}, October 13, 1968, Odessa, Texas, 69.
\item \textsuperscript{128} “Building Boom is Continuing,” \textit{Odessa American}, June 12, 1977, Odessa, Texas, 119.
\end{enumerate}
\end{footnotesize}
civic pageantry that the industry would sustain constant growth and that Permian Basin communities would continue to defy the isolated and arid location, muffled the consequences of daily workplace exposure to toxic waste and hazardous materials.

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Permian Basin oil production and regional industry wealth reached its all-time high in the late 1970s and early 1980s. This took place during an era of rapid change. In the mid-1960s, the Oil Chemical and Atomic Workers Union (OCAWU) began a North American public awareness campaign documenting workplace health hazards in the energy industries. The OCAWU was part of a wider movement. In the late 1960s, grassroots environmental activists began widespread campaigns to mitigate the consequences of unregulated chemical and fossil fuel use. This movement led to federal regulation and helped spur the founding of both OSHA and the EPA. Both regulatory organizations began sweeping overhauls of allowable chemical exposure levels and waste disposal practices. However, the 1973 oil embargo spawned a desperate domestic need for more oil, the deregulation of US oil prices, and delayed regulatory crackdown. Ongoing automation in oil refining and chemical production continued to erode labor power and decrease the number of entry level jobs available in the industry.

In contrast to vocal and often bitter national debates about the relationship between oil companies and communities, typified by the dramatic and damaging testimonies from oil workers at OCAWU hearings, Permian Basin locals continued to defend oil companies. Elites and corporate boosters continued to laud the Permian Basin oil industry as an egalitarian force and an example of an ideal partnership between industry and community. Outsider oil tycoons used cowboy imagery to create a feeling of
permanence in the region, legitimating industry control over the land by demonstrating familiarity with local culture. As the costs of oil production and fossil fuel dependence was being questioned elsewhere, Permian Basin communities closed ranks, retreating into nostalgia for an imagined, independent regional past in which isolated, fully-autonomous oil prospectors beat the odds – and the region’s harsh environment – in the search for profit.
Conclusion

Permain Basin oil production reached an all-time peak in the late 1970s. Less than five years later, the Texas oil industry collapsed. This came after a period of wild speculation. After seven years of sharp increases, global oil prices began to stabilize in the late 1970s. Oil producers continued to expand drilling operations in an effort to maintain profits. By the mid-to-late 1970s, Permian Basin drilling contractors began dipping into their savings to cover rising operating costs. Oil companies took out increasingly large – and increasingly risky – loans which regional banks were more than happy to provide. Balanced on a knife-edge, such economic speculation could not survive local overproduction and yet another, sudden drop in prices.¹ In early 1983, the Organization of Petroleum Exporting Countries (OPEC) cut crude oil prices from $34 to

$29 per barrel. The next year prices plummeted as low as $7 per barrel. This caused immediate crisis in Texas as loans came due and oil companies were unable to pay their debts. As oil companies filed for bankruptcy across Texas, banks failed and general financial chaos erupted. Statewide oil and gas employment decreased by one-third between 1982 and 1994 and the oil industry fell from one-quarter of the total Texas economy in 1981 to around twelve percent in 1991.

These losses hit hardest in the Permian Basin. The crisis peaked with the 1984 collapse of the First National Band of Midland, the largest independent bank in Texas, with dozens of businesses in the Permian Basin declaring bankruptcy soon after. Sudden industry contraction left thousands destitute. Average income in the Permian basin plummeted as oil companies laid-off most of their employees. A comparison between the 1980 and 1990 census reveals the decade-long impact of the regional downturn. In 1990, seven years after the sudden drop in oil prices, Texas poverty levels remained at a staggering 20.4 percent, up from 14.6 percent in 1980. Midland County was similar, with poverty rates rising sharply from 6.2 percent in 1980 to 14.5 percent in 1990. Particularly hard hit was West Odessa, an industrial exurb near Odessa and adjacent to the Odessa

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Petrochemical Plant and made up almost entirely of working-class oilfield workers. In 1985, three quarters of the population lived in rented mobile homes, with a poverty rate of 24 percent.\(^5\)

While Permian Basin boosters had been seemingly unfazed by union calls for better workplace safety or increasingly visible environmental contamination throughout the 1970s, it would take this economic catastrophe to temporarily halt perpetual veneration of the oil and chemical industries in the local popular press. Many seemed hopeful, confident that an industry with such expansive control over local geography and ecology would quickly bounce back. Others chose to blame oil unions, understood as gouging the industry for higher wages and the increasingly vocal environmental movement that placed invasive restrictions on industry expansion. Few blamed the oil companies themselves.\(^6\)

However, instead of facilitating a reevaluation of the industry’s role in economic development or providing a space to discuss the environmental and public health consequences of constant industrial growth, the *Odessa American* choose to weather the crisis by simply avoiding any discussion of the industry altogether. In particular, Odessa’s famed Petrochemical Complex largely disappeared from the newspaper after 1983. Little of the local boosters’ original narrative could be salvaged in the face of

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region-wide abandonment by the companies that residents had supported without question for decades. As the majority of US oil companies moved production out of the United States, either onto offshore rigs in the Gulf or to the Middle East’s more prolific extraction sites, the industry’s narratives of constant growth and ecological control collapsed on themselves, leaving only an absence in place of decades of constant regional boosterism.⁷

This does not mean that locals simply gave up on the oil economy. Oil prices remained low. This kept production costs in the US petrochemical industries low even as demand increased. As a result, total American petrochemical production increased during the 1980s.⁸ Locals worked hard to save the region’s oil processing industry – especially the Odessa Petrochemical Plant. Most efforts were unsuccessful. Because El Paso Corp was primarily a natural gas transport company, it was hit particularly hard by the downturn in extraction. The Burlington Northern Railroad Co. bought El Paso in 1983. To save the flagging empire he helped to found, W. D. Noel came out of retirement in 1984 to lead an employee buyout of the El Paso Products Co. brand, keeping the plant open and temporarily saving several hundred Odessa jobs.⁹

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Relative stability by the late 1980s made some cautiously optimistic. In 1987, Chris Van Wagenen of the *Odessa American* hedged that, “Corbett [editor of the *Houston Gas Journal*] said he believes companies like El Paso that survived the downturn are now equipped to do quite well through the year 2000.”10 El Paso Products continued to participate in civic activities such as 1987’s “Beautify Odessa Week.” However, such news was tempered by the discovery of massive environmental contamination and petrochemical plants and refineries throughout the region.11 In the 1980s and 1990s, cleanup and pollution remediation efforts began at the Odessa Plant as well as refineries and petrochemical plants throughout the Permian Basin.

For much of the industry’s history, the rigid lines of racial and economic segregation had kept residents in neighborhoods most affected by pollution conveniently out of sight and out of the minds of industry elites. By the mid-1990s, inhabitants of Odessa’s low-income black and Latinx neighborhoods closest to the plant were fed up. For decades, residents had seen only a stunted percentage of the economic boom the plant had initially brought to the city and while the downturn in the oil economy probably decreased the scale of regional air pollution, it did not make the problem disappear. Instead, residents were faced with the dual challenge of a bad economy, few job prospects, and a string of health problems related to chemical exposure. Without the constant affirmation in the popular press that the petrochemical industry was a pillar of the community – without the fate of both resident’s livelihood and community cohesion

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seemingly resting on its continuation – residents had the opportunity to speak up and, even more importantly, to be heard. The decision to charge the complex with environmental health and safety negligence reflected the legacy of workman’s compensation advocacy and environmental protection agitation built up throughout the 1970s and 1980s. While the success of the 1991 NAACP class action lawsuit did not right past wrongs, it did provide an avenue for residents to vocally express their opposition to the community’s underlying principles.

In a final irony, the NAACP lawsuit and subsequent investigations revealed that contamination from the Odessa Petrochemical Plant had in fact reached much farther than the directly adjacent neighborhoods. Although more affluent Odessa residents had fled the south-central neighborhoods, seemingly escaping the waves of toxic contaminants produced by the plant, emissions traveled much farther than expected, with even the wealthiest residents subject to increased liver cancer rates, respiratory problems, and contaminated ground water.\(^{12}\) White elites had not avoided contamination, with all parts of Midland, neighboring Odessa, and surrounding counties experiencing elevated air and groundwater contamination from secondary recovery methods, increased petrochemical production, and pipeline expansion.\(^{13}\) Those who had clung hardest to the

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\(^{12}\) According to the EPA, there are currently six active Superfund Sites in Midland and Odessa. Four more sites are designated as “RCRA Hazardous Waste – Corrective Actions” and two sites are undergoing evaluation and response. With the exception of the Odessa Petrochemical Plant site, most of these are located on Odessa’s north side or Midland’s west side. “Cleanups in My Community Map,” US Environmental Protection Agency, accessed Jun 8, 2017, https://www.epa.gov/cleanups/cleanups-my-community.

belief that the oil industry was fundamentally integral to the health and continuity of the regional economy and society had been for decades also contaminating themselves through the very industries they supported. Steeped in community silence and the willful blindness of city officials, even as the Odessa Petrochemical Plant gave the city – the body politic – life, it simultaneously damaged the lives of many people most intimately acquainted with it.

After limping along under a series of different managers, the Odessa Petrochemical Plant became a victim of twenty-first century global industry consolidation, finally closing for good in 2009. The site is now abandoned. After over fifty years of largely unregulated petrochemical, plastic, and rubber production the land was designated a National Superfund Site with ongoing environmental cleanup efforts culminating in the plant's demolition in late 2013.14

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Over the course of the Permian Basin oil boom the accepted limits of environmental, economic, and social risk were historically contingent and constantly renegotiated. Disparate and potentially isolated events such as union agitation, racial segregation, economic depression, and environmental activism collided with local climate, and ecology, geology to dictate the trajectory of industry policy, technological

development, and environmental impact.

Oil workers did not simply make a conscious tradeoff between environmental degradation and economic stability. The steady development of increasingly sophisticated oil detection, extraction, and transport technologies encouraged workers to look to technology when confronted with the problems of resource depletion or environmental contamination. Although Permian Basin oil employees maintained an identity steeped in a narrative of oil prospecting, luck, and rough-and-tumble cowboy individualism, the region’s oil industry expansion was defined by steadily increasing efforts to manage oil production in a way that would diffuse risk to profits - by managing and effectively predicting the supply of available crude oil through new technologies, reducing the amount of oil waste byproducts, and carefully managing the region’s labor force. Such efforts created a disconnect between the industry’s daily realities and the aspirations of company elites. Even as many industry leaders worked to create scientifically managed oil landscapes – with nature optimized and quantified to produce a predictable, steadily-increasing supply of oil – a volatile wage labor market, competing understandings of private property and free enterprise, technological limitations, and fears of regional energy depletion constrained these efforts.

The discovery of significant oil deposits under the Permian Basin in the 1920s kicked off a steady wave of human migration to the region that spanned most of the twentieth century. Initially oil workers made up a class of economic migrants who lived and worked in temporary tent settlements strung across the desert. The harsh conditions dissuaded few people. For many of these migrants, the desire for quick profit outweighed the region’s inhospitable climate and monotonous vistas. By the Second World War,
most of the region’s temporary oil settlements had become established industrial communities with oil tax-funded schools, police forces, and industrial centers. The centrally located cities of Midland and Odessa grew as the region’s oil industry supply, transport, and financial centers, self-consciously sporting all the markings of civilization including skyscrapers, luxury hotels, golf courses, and suburban developments.

Because the majority of the regional population arrived with the oil boom, the politics and demographics of the Permian Basin consistently reflected the values and hiring practices of the oil industry writ large. Through the early 1980s the region, despite its proximity to the Mexican border, was predominately white, mostly male, and between the ages of 20 and 30. Residents were highly individualistic, opposed both to any sort of industrial regulation or worker unionization. Quick profits and economic opportunism were watchwords for the oil workers who settled the area. Racial segregation and a narrative that Anglo oil workers – armed with ever-advancing oil technologies – would civilize the desert was common in industry booster rhetoric and in the popular press.

In this climate, oil workers described the search for oil as a game with humans set against the natural world in a bid for oil extraction. Workers played this game using technologies such as massive drills, electric pumps, and “Christmas tree” blowout protection devices. In the postwar era, knowledge of surface ecology and subsurface geology was increasingly mediated through technologies such as the seismograph, the magnetometer, and the well logging system, that replaced the human senses. These technologies distilled natural processes such as subsurface vibration and radioactivity into numeric values and a series of bars on a line graph. As oil deposits were slowly depleted in the 1960s and 1970s, the region became the site of experimental secondary recovery
methods such as flooding existing wells with water, gas, or other chemicals to boost well pressure.

Despite the limitations of climate and geology, technological development made Permian Basin oil exploration continuously profitable at the expense of the region’s nonwhite populations. Narratives of progress through technology mixed with cowboy nostalgia for a mythical and unregulated regional past cast Latinx and black residents as either inferiors to be civilized by oil personnel or simply elided their existence altogether. White oil workers and their families saw themselves as immune to the industry’s consequences and so ignored environmental or public health warnings about groundwater contamination or air pollution. Far removed politically, geographically, and culturally from debates about environmental conservation or worker health and safety, the interests of the industry reigned supreme and the oil flowed.

This narrative of industry hubris becomes doubly important as the cycle of oil industrialization begins yet again in West Texas. After 2008, a sudden spike in global oil prices rejuvenated Texas oil fields. Yet again, technology was brought in to solve the problems of oilfield depletion. Horizontal drilling and hydraulic fracturing seemed like miracles that immediately revived the region’s waning industry.15 In 2011, the United

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15 As of the 2010 census, the Permian Basin was home to approximately 400,000 people with the adjacent regional economic centers of Midland and Odessa retaining a relatively stable combined population of 200,000. The land area of both cities was almost completely covered in oil and gas wells. As of 2015 the population of Midland was 126,872 and 2,607 oil and gas wells operated within the city limits. 72 percent of the Midland Metro area was impacted by working oil and gas wells. Similarly, the Odessa metro area population was 137,130 and contained 2,165 oil and gas wells. This affected 60 percent of the city. US Census Bureau, Census of Population and Housing 2010, accessed April 16, 2017, https://www.census.gov/prod/www/decennial.html.; “Petition to the United States Environmental Protection Agency, Earthjustice, May 13, 2014, accessed April 16, 2017,
States once again exported more oil and petroleum products than it imported. In 2016 a
group of petroleum geologists reported that the largest single oil fields ever discovered
had been found below the Permian Basin. This oil, trapped in local shale deposits, was
only accessible through increasingly unpopular and environmentally destructive
“fracking” technologies. At this moment, despite the economic trials of the 1980s and
1990s and despite extensive evidence of the industry’s steep public health and
environmental consequences, it remains to be seen if workers, residents, and industry
officials will learn from their past mistakes.

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ARTICLES


“The Campus that Oil Built: Visualizing the University of Texas’ Extractive Wealth in the Age of the Corporate University.” Reading the American University, Ed. Meghan Sweeney, McFarland, 2016.

OTHER PUBLICATIONS


**BOOK REVIEWS**


**IN PREPARATION**

“Routes of Conflict: Texas Oil Networks and the Regulation of Nature.”

**HONORS & AWARDS**

William & Mary Market Access International, Inc. Award for Excellence in Scholarship in the Humanities and Social Sciences, 2013

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Provost Dissertation Writing Fellowship, William & Mary, 2016-2017
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Lemelson Center Dissertation Fellowship, National Museum of American History,
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Conference Travel Grant, American Studies Program, William & Mary, 2012-2016
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DIGITAL HUMANITIES

Primary Investigator, Mapping the Cost of Texas Oil Expansion, 2015-Present
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Annett Kolodny Prize Committee, Environment and Culture Caucus, American Studies Association 2016-Present
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Organizer, Environment and Culture Mentoring Breakfast, American Studies Association Annual Meeting, Toronto, ON, 2015

INVITED TALKS
“Better Living Through Oil: Texas Oil Reimagines Itself After World War II.”

CONFERENCE TALKS

Panels Organized


Panel Participation


"Perfecting Your Pitch,” ASA Students' Committee Round Table, Annual Meeting of the American Studies Association, Toronto, ON, October, 2015.

Papers Presented

“Risky Business: Capitalism, Labor, and the Environment in Twentieth Century
Texas Oil Communities,” Newberry Seminar in Labor History, the Newberry Library, Chicago, IL, May, 2017.


“Plumbing the Depths: Drilling as Ecological Knowledge in Texas Oil Communities,” Annual Meeting of the American Society for Environmental History, Chicago, IL, March 2017.


“From Farm to Refinery: Pulling Value From the Ground in Middle America,” When Nature and Numbers Don’t Meet Symposium, Holtz Center for Science and Technology Studies, University of Wisconsin-Madison, Madison, WI, April 2014.


CAMPUS TALKS


“Framing Remarks,” Monsatorama!: Second Annual Professors’ Round Table, Sadler Center, College of William & Mary, Williamsburg, VA, March 2013.

TEACHING EXPERIENCE

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Pleasure, Pain, and the End of Oil, Summer 2017
Technology in American Culture and Society (seminar), Fall 2015
Keio University/William & Mary Cross Cultural Collaboration Program, (seminar), Summer 2014

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Film Festival History and Production, Fall 2013
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Sexuality in America, Spring 2012

CAMPUS & COMMUNITY SERVICE

Researcher and Film Selection Committee, Boulder International Film Festival, Colorado Film Society, Boulder, CO, 2014 - Present
Assistant Director, William & Mary Global Film Festival, Roy R. Charles Center for Academic Excellence & Reves Center for International Education, 2012-2014
Assistant Director, Keio University/W&M Cross Cultural Collaboration Program, Reeves Center for International Education, 2013
Researcher and Museum Event Organizer, Preservation Virginia’s Bacon’s
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President, American Studies Graduate Student Association, College of William & Mary, 2012-2013
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Graduate Office Assistant, American Studies Program, 2010-2011

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