Atomic Workers, Atomic City: Labor and Community in Oak Ridge, Tennessee, 1942-50

by

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ABSTRACT

This dissertation examines the experiences of Manhattan Project worker at Oak Ridge, Tennessee, between the years 1942 and 1950. It begins with an account of labor recruitment to the site, and housing and employment policies of the Army and its contractors. Next, it details the experiences of workers on the job, and the hazards they faced from radiation and chemicals. The next chapter turns to issues of workplace control, and the resistance of workers, including wildcat strikes, to management encroachment on worker's rights. The story then shifts to the post-war era, in which Oak Ridge changed from a temporary outpost to a permanent community, helping to bring about the unionization of Oak Ridge in 1946. Contract negotiations followed in 1947, but were stalemated by government and employer intransigence, as well as by new Federal restrictions on strikes in national defense facilities. Finally, the dissertation examines the radiation safety standards and human experimentation on workers that took place at the Oak Ridge facilities.

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Founding Oak Ridge

In September 1942, west of Knoxville, Tennessee, General Leslie Groves looked out on sparsely populated farmland tucked between two ridges, an area that would come to be known as Oak Ridge. The site was chosen for its proximity to rail lines, its safe distance from the coast, and the fact that the sound and fire of any accidental explosion would be muffled by the surrounding high ridges. Within months, the space was a swarm of construction equipment and workers, earthmovers and cranes. These men and machines built four facilities comprising over 400 buildings, in order to process atomic materials for the Manhattan Project. By 1943, full scale production of uranium and plutonium had begun, and tens of thousands of workers were hired to work the dials and valves of the electromagnetic and chemical machinery that separated isotopes of uranium.

Oak Ridge was one of four main sites for the Manhattan Project, along with Los Alamos, New Mexico, Hanford, Washington State, and Chicago, Illinois. The best known site, Los Alamos, was the scientific center of the project, where physicists and mathematicians developed the design of the bombs, and assembled its final components. The second site, the Chicago Metallurgical Laboratory created the world's first self-sustaining nuclear reaction beneath the football field of the University of Chicago. Less well known than the scientific sites were the production facilities of the Manhattan Project. In Oak Ridge and Hanford, Washington, engineers, scientists and workers processed materials that would form the core of the bomb. At Oak Ridge, great factory buildings separated U-235 and U-238, synthesizing the explosive for the first atomic bomb. At Hanford, plutonium, a newly discovered man made element, was created, gram by gram, for the second atomic explosive used at Nagasaki.

Oak Ridge was a critical link in the Manhattan Project, processing uranium into the explosive material for a working nuclear device. First uranium mined in the Belgian Congo and Canada was milled off site, then brought to Oak Ridge, where it was refined and separated into its two isotopes. In the gaseous diffusion plant (K-25), uranium was combined with fluoride and was pumped through a thin metal barrier that separated U-235 from U-238. Then, the product of K-25 was brought to Y-12, where it was further refined in cyclotrons to electromagnetically separate the isotopes, leaving a residue of U-235 dust for use in the bomb. At X-10, or Clinton Laboratories, tons of this uranium was used to create a few grams of plutonium, as a pilot plant for full-scale plutonium production at Hanford.

Work at Oak Ridge

The work at Oak Ridge was labor intensive. The great factory facilities were built quickly, requiring a small army of skilled construction workers. The wiring and plumbing for each facility needed to be nearly perfect in order to avoid spoiling the scarce product. Each step was critical, and close monitoring was necessary at all times. In addition, the entire facility needed maintenance and cleaning, requiring another work force.

Workers were recruited throughout the nation, from skilled trades workers from New York to unskilled laborers recruited out of the cotton fields and lumber mills of Alabama, to coal miners brought from throughout Appalachia to work in the factories. The Manhattan Project had the highest priority rating for recruitment of workers during World War II's tight labor market, but still found it difficult to keep its operation supplied with manpower: The project and its contractors sent recruiters throughout the South. Workers could only be told that they would be brought to Knoxville to work on a "government project." However, workers could not be told the purpose of the facility or of the job they were hired to do.

On arrival at Oak Ridge, workers were told that they were working for the cause of freedom, but paradoxically, those living in Oak Ridge found themselves in a military-base atmosphere. To exit or enter the city, residents passed through one of seven "gates" where badges would be checked (even children had them) and cars were searched by military police. The plants had checkpoints and fences of their own to keep out all but their employees. Within the three plants, the content and purpose of each job was a military secret. Element names, such as uranium, plutonium and fluoride, were changed into code, with a different code at each plant. Workers wore different colored overalls and badges unique to their job and were forbidden to discuss their jobs with fellow workers or family members. Outside the plants, badges could be checked at any time. The Army administered Oak Ridge without pretense of democracy; for the duration of the War, no local elections were held. Socially, Oak Ridge, resembled a coal company town, with a critical difference- in Oak Ridge, the Federal government was in charge, not a company.

During World War II, union organizing in the plants at Oak Ridge was forbidden by the military, which asked the Presidents of the AFL and CIO to refrain from organizing workers at the site. Military security, uniformed and plainclothes, kept an eye on workers both in the work place and in the city, relying on a network of thousands of informants.

The experiences of workers at Oak Ridge during World War II and after raise many questions for historians. How could workers gain any control of their workplace under strict security conditions? How did the situation at Oak Ridge change after the dropping of the atomic bomb? How did the union organizing drives at Oak Ridge in 1946 impact the plants and the community? How safe was work in the plants and life in the community?

From Oak Ridge's founding in 1943 until 1946, the recruitment process, structure of the workplace, and Army labor policy fundamentally limited workers' power in the processing and separation facilities at Oak Ridge. Under pressure from national unions and from grassroots covert union organizing, the Army decided in 1946 to allow union elections at Oak Ridge.

This dissertation will demonstrate that the success of the 1946 Oak Ridge union organization drive by the AFL and CIO fundamentally transformed the community. Oak Ridge changed, in the summer of 1946, from an Army controlled, highly regimented worksite, to a unionized, community still run by the Federal government, but in which residents had political, civic and labor rights. Unlike much of the rest of the South, at Oak Ridge, a majority of workers became union members, defying the stereotype of the passive or anti-union southern worker. These workers used their unions to make demands not only in the workplace, but also to confront the military about their control of the community.

After the union victory, however, the 1947 Taft-Hartley Act and AEC labor policy restricted Oak Ridge unions' right to collective bargaining and eliminated their right to strike. As a result, though unions made significant gains in the community, and in wages, seniority and benefits, the central issues of control of the factories and information about the work process remained in the hands of AEC and the contractors, much as before the war. As a consequence of this government monopoly on information, the AEC and the contractors kept information about workers' health and safety issues secret from both workers and the general public. Under the cloak of national security, the contractors and AEC at Oak Ridge knowingly exposed workers and the community to harmful levels of radiation and toxic substances.

Historiography of Oak Ridge

This thesis departs from the conventional literature on the history of Oak Ridge and the Manhattan Project in three ways. First, this dissertation treats workers and their organization as central to the history of the project. Official histories of the Manhattan Project give scant attention to workers. Second, the community and the work place are considered as interconnected arenas of struggle at Oak Ridge: labor activism influenced the

life of the community, and community activism enriched unionism. Prior studies have focused either on the community history, or on the work done within the plants, without drawing connections between the two. Finally, this dissertation bridges state level and community studies of labor history, treating Oak Ridge's community history as part of the national story of World War II, reconversion to peace, and the coming of the cold war.

Oak Ridge can viewed through several different lenses of historical inquiry. First, there has been the official histories of Oak Ridge. The Manhattan Project itself collected historical documents for preservation and internal analysis, as did its contractors. Though these sources did not become declassified until the 1960s, they were used by Atomic Energy historians Oscar Anderson and Richard Hewett in their 1962 The New World. Both the United States Army and the Army Corp of Engineers wrote their own histories of the project as well, stressing their contributions to the effort to build the atomic bombs.[1]

These official histories are monumental in character; they seek to memorialize the administrative and managerial accomplishments of their agencies, while downplaying the role of other agencies involved. These histories also seek to portray the project as an orderly, almost clinical undertaking. Official histories of radiation safety standards of the project, such as Barton Hacker's *The Dragon's Tail* and J. Samuel Walker's *Regulating the Atom*, depict the project as a model of radiation safety even under high-pressure conditions.

Historians of science and technology have drawn from these official histories in their accounts, and have expanded on them. Thomas Hughes, in his Networks of Power, places the Manhattan Project in the context of national technological development, such as the Tennessee Valley Administration (T.V.A.). Hughes cuts through the official bravado of the official histories, but he does not address the situation of workers on the project.[2]

Community histories of Oak Ridge have taken a different approach to the subject. Instead of viewing Oak Ridge as part of a huge, centrally driven technological system, the focus has been shifted to the grassroots level. Charles Jackson and Charles Johnson, in their *City Behind a Fence*, portray the Oak Ridge as a place where people lived, worked, and attempted to build a community. In *These are Our Voices*, writers from the Oak Ridge community tell their own history, from the days before the plants were built until the present day. However, community history approaches have been unable to make the links between workplace and community issues. This problem is made almost impossible to

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[1] Richard Hewlett and Oscar Anderson, *The New World: A History of the United States Atomic Energy Commission, Volume I, 1939-1946.* (Berkeley: Univ. of California Press, 1990 (Original Edition, 1962)). Vincent Jones, *Manhattan: The Army and the Atomic Bomb*, (Washington, D.C: Center for Military History, 1985). Richard Hewlett and Francis Duncan, *Atomic Shield: A History of the United States Atomic energy Commission, Volume II., 1947-52.* (Berkeley: Univ. of California Press, 1990 (Original Edition, 1962)). Barton Hacker, *The Dragon's Tail*, (Berkeley: University of California Press, 1987). Stephane Groueff, *Manhattan Project: The Untold Story of the Making of the Atomic Bomb.* Boston: Little, Brown and Co., 1967. Barton Hacker, *Elements of Controversy: The Atomic Energy Commission and Radiation Safety in Nuclear Weapons Testing, 1947-74.* Berkeley: University of California Press, 1994. George Mazuzan and J. Samuel Walker, *Controlling the Atom: The Beginnings of Nuclear Regulation, 1946-62.* Berkeley: University of California Press, 1985. Walker, J. Samuel. *Containing the Atom: Nuclear Regulation in a Changing Environment.* Berkeley: University of California Press, 1992.

[2] Thomas Hughes, *American Genesis: A Century of Invention and Technological Enthusiasm,* (New York: Penguin, 1989). Hoddeson, Lillian, et al. *Critical Assembly: A Technical History of Los Alamos During the Oppenheimer Years, 1943-1945.* (Cambridge: Cambridge University Press, 1993).

surmount since information on work inside the plants has been restricted since World War II, making it impossible for historians to learn enough about the subject to write about it.[3]

Labor history has yet to address the field of atomic work, such as that done in Oak Ridge. This lack of interest is the result of two factors; first, labor historians have concentrated on the era between the Progressive era and World War II, rather than addressing post war topics; second, the field has concentrated its energies on skilled workers and their transformation from artisans into workers, therefore making new industries less appealing subjects to explore. Jerry Lee Lembke has noted that both these tendencies have made labor history less relevant to present concerns of workers, alienating the field both from the mainstream of history, as well as from workers themselves.[4]

Dissertation Chapter Summary

In Chapter Two, I describe and analyze the recruitment of workers to Oak Ridge, and the factories and communities in which they worked and lived in the years 1942-5. The Manhattan Project, under strict Federal recruiting regulations, brought workers from throughout the South, promised workers a community with a better education system for their children, steady work for all family members, and decent, affordable housing. In this chapter, I argue that these broken promises shaped worker grievances at Oak Ridge, as workers organized around these "non-wage" issues after the war.

In Chapter Three, I argue that the Manhattan Project leadership structured the workplace so that employees would have no knowledge outside their specific job or of the ultimate purpose of what they were producing at Oak Ridge. The extensive security system enforced by the Project curtailed worker organization and activism, and kept workers in the plants and residents in their communities effectively isolated from those around them.

Chapter Four describes the War Department's labor policies at Oak Ridge and the decision to prohibit union organizing at Oak Ridge for the duration of the war. The Army's anti-union policy at Oak Ridge during World War II gave contractors a free hand in setting up the work system in ways that were detrimental to worker rights. However, workers did not always comply with military or contractor policy, and this chapter describes the actions workers took at Oak Ridge to resist what they saw as unjust actions.

In Chapter Five, the effects of the end of the war on Oak Ridge workers are explored. The military and industry both sought, through the Army "E" Award program, to take credit for the creation of the atomic bomb, and to maintain the Military-Industrial coalition that had dominated the city since the beginning. However, Oak Ridge workers had begun to question Army control of the community, and demanding the right to labor and civil rights. With the end of the war came a transformation of consciousness when residents began to shift their view of Oak Ridge from a temporary work place to a permanent community. This transformation had a profound effect on worker activism.

Chapter Six describes and analyzes the impact of the 1946 southern organizing drives of the CIO and AFL on Oak Ridge. Of the three plants at Oak Ridge, the CIO won one plant for its Gas, Coke and Chemical Workers, and a coalition of AFL unions won another, leaving a third with no union representation. Union successes at Oak Ridge after World War II were due to AFL and CIO campaigns to organize the entire Oak Ridge community, rather than only the factories. The union campaigns challenged military rules in the community, created free speech, press and assembly rights in the city. Community and

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[3] Charles Jackson and Charles Johnson, *City Behind a Fence: Oak Ridge, Tennessee, 1942-6.* (Knoxville, Univ. of Tennessee Press, 1981).

[4] For examples of Progressive to New Deal labor history, see Jerry Lee Lembcke's Labor History's "Synthesis Debate": Sociological Interventions. *Science and Society*, 59 (Summer 1995), pages 137-73.

work place issues were combined in such a way that made victory possible at Oak Ridge in ways it had not been possible elsewhere in the South.

In Chapter Seven, I describe the negotiations that followed these union victories, and the ways in which the AFL and CIO sought to change the work environment at Oak Ridge, only to be met by resistance on the part of contractors and the Federal government. Labor unions were legally unable to challenge management and Federal government control of the work process at the plants, due to restrictions on their right to strike. Collective bargaining did not produce the results for labor at Oak Ridge that were achieved in other industries, such as automobiles or steel.

In Chapter Eight, I explore the health and safety issues of work at Oak Ridge. The setting of health and safety policy at Oak Ridge remained the monopoly of the Atomic Energy Commission and its contractors in the postwar period. Workers were never fully protected from radiation and chemical hazards at the plant, or from environmental contamination in their communities. The Manhattan Project and Atomic Energy Commission both knew about the hazards of radiation and other chemicals at Oak Ridge, yet allowed occupational and environmental exposure to take place.

This exposure of workers to radiation was a result of the "permanent emergency" conditions of work at Oak Ridge. During the war, the Manhattan Project institutionalized a policy of maximum production in minimum time, in order to reach project deadlines. In the post war years, this system did not disappear. Instead, the cold war became the source of the emergency, and the pattern of putting production needs over safety and health concerns continued.

The story of workers at Oak Ridge is therefore, a microcosm of the transition from the "Good war" to the "Cold war." At Oak Ridge, the atomic problems associated with the cold war - the human radiation experiments, the seemingly infinite requirements to produce nuclear arms, the degradation of the environment in the name of national security - all had their origin in World War II policies of the Manhattan Project. All of these problems were "present at the creation" of the Manhattan Project, as the study of Oak Ridge during this period demonstrates.

Chapter 2: Recruitment of Workers for the Manhattan Project in Oak Ridge, Tennessee, 1943-45

One of the first questions that the Manhattan Project's leaders had to face was the issue of industrial manpower. Where and how would workers be recruited to work at Oak Ridge in the midst of World War II's tight, highly regulated labor supply. With millions of men sent overseas to fight, and war plants soaking up available workers across the country, where were there enough extra workers to man construction sites and factory equipment at Oak Ridge?

This task was made more difficult by the Federal restrictions on wartime labor recruiting and the many Federal organizations charged with enforcing these regulations. The War Manpower Commission [WMC] regulated recruiting practices by companies engaged in war work to prevent "labor piracy." The National War Labor Board [NWLB] held wage increases down to keep wartime inflation in check. Industrial recruiters during World War II faced a frustrating system of constraints on what they could offer prospective employees. This system of regulations restricted the ability of the Manhattan Project to recruit solely on the basis of wages, as these wages were limited to the local or national rate for the job performed. This inability to offer higher wages should have doomed the efforts to recruit hundreds of thousands of workers to unknown, remote locations where they would do tedious and difficult work.

The Manhattan Project circumvented these restrictions by offering other non-wage incentives to workers, which supplemented wages as a source of recruits. These incentives included the educational system at Oak Ridge, on-site housing in dormitories and trailers, and enough steady work for entire families to come to the site. Additionally, the Manhattan Project, through its contractors, sometimes disregarded governmental restrictions on "labor piracy" in order to bring African-American, white agricultural workers, and women to Tennessee with promises of better jobs, higher pay and increased job opportunities for blacks.

After the war, however, the promises (housing, wages, steady work) made to workers to get them to Oak Ridge, some kept, some postponed, were used against military authorities by unions to convince plant workers to unionize at Oak Ridge. The promises of steady work and a decent community that had been used by the Army as an incentive to relocate became rights that workers demanded. Therefore, the recruitment strategy ultimately was used against the military authorities at Oak Ridge, just as welfare capitalist strategies of non-union industrial employers in the 1920s were used against companies in the 1930s by the CIO.[1]

The Importance of Construction and Industrial Recruitment

From the beginning, the Manhattan Project leadership recognized the importance of labor, both skilled and unskilled, to its success. General Leslie Groves knew from the beginning that the Project would involve tens of thousands of workers. However, he did not predict the massive scale of the operation, that almost 500,000 workers would eventually work on the project, with a peak of 80,000 construction workers and 40,000 production or factory workers at any one time.

The War Manpower Commission, charged with regulating and coordinating the flow of workers in war industries, realized that the Manhattan Project had a seemingly

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[1] Lizabeth Cohen, *Making a New Deal : Industrial Workers in Chicago, 1919-1939.* Cambridge [England] ; New York : Cambridge University Press, 1990. For criticisms of Cohen's model, "A symposium on *Making a New Deal: Industrial Workers in Chicago, 1919-1939*, by Lisabeth Cohen." *Labor History* 32:562-98.

unlimited demand for workers. A December 15, 1943 WMC report for Knoxville, Tennessee, noted, "The unknown demand at Clinton Engineer Works overshadows all known demand. Despite hiring, which has taken place at this project for the past four months, it is entirely possible that the demand for the forecast period will double or triple the known demand."[2] Labor shortages were chronic at Oak Ridge. In 1943, the Project estimated that it would need 11,117 recruits to bring its labor force up to necessary staffing levels. This included 1,851 carpenters, 530 electricians and 4,482 "laborers and tenders." Two years later, the Project speculated that it needed 4,000 more workers to staff the factories at Oak Ridge, exclusive of replacing those workers that quit or were fired.[3] The lack of sufficient manpower could delay the project as much as any scientific or technological setback, and Groves kept track of any manpower or labor problems with great concern. Groves's diaries detail numerous imminent production bottlenecks, all due to the Project's vast needs for scarce construction laborers.

Skilled labor in particular was in short supply. These workers were, in some situations, more valuable than scientists, of which the Project possessed a surplus. Groves noted on June 19, 1944, "J.A. Jones needs 300 - 400 electricians" and suggested "securing loans of electricians through unions for a period of from 4 to 6 months."[4] The delays that could be caused by lack of men to wire up new factories or connect the pipes used for manufacturing processes threatened to bring the project to a halt. One month later, Groves wrote, "One of the areas completely down for lack of pipefitters. ... [They] have reached the point where they are talking of delay of a month."[5]

At that time, Knoxville was almost tapped out. The WMC estimated that in 1943-44, there would be only 400 unemployed men and 1,000 new female entrants to draw upon in the labor market area.[6] With such a "seller's market," and the additional security limitations imposed upon a recruiter's ability to describe the job or area, the Army offered potential recruits several incentives to come to Oak Ridge. Although the National War Labor Board held wages to the inflation rate for the duration of the war, workers could be offered higher-than-average wages and on-site housing, among other enticements. As one recruiter put it, "We gave them more money, we gave them a free bus ride, and we gave them rooms for $2 and a half."[7]

Faced with a labor shortage in Knoxville, many corporations travelled outside of the city in search of workers, and took extraordinary measures once they got there. Tennessee Eastman Corporation recruited in Knoxville, Lenoir City and La Follette, and surveyed households to determine potentially employable members of the household. Stone and Webster Engineering, another Oak Ridge firm, recruited throughout the South, stopping in one recruiting tour at Tutwiler, Marks, Webb, Batesville, Sardis and Crenshaw, Mississippi.[8] In one Tennessee city, a manufacturer

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[2]United States War Manpower Commission. "Labor Market Development Report," December 15, 1943, page 5. Box 11. Record Group 211, Region 7, National Archives Regional Branch, East Pointe, Ga. [Hereinafter LMDR]

[3]United States Army, Manhattan Engineer District. "Manpower Needs," Entry 5, Box 46, Decimal File 201. Record Group 77, National Archives, College Park, Md.

[4]Leslie Groves, Diaries of General Leslie Groves, June 19, 1944. Groves Gift Collection, RG 200, National Archives, Washington, D.C. [Hereinafter GD]

[5]GD, July 17, 1944.

[6]LMDR, page 8

[7]Jackson and Johnson Interview.

of Ferro-Manganese complained that Stone and Webster, to circumvent wartime restriction of employed workers' movements, was "encouraging our men to quit and take 30 days off to qualify them to take a job at [Oak Ridge]. We have recently lost a large number of employees on this account and unless it is stopped promptly we will be forced to curtail production."[9] The Project itself also combed the South; in 1944, the Manhattan District sent 41 recruiters out across the region in search of workers, targeting Nashville, Memphis, Knoxville, and Chattanooga in Tennessee, cities in Virginia, Georgia and Alabama.[10] Skilled construction workers, such as carpenters, electricians or plumbers, were drawn from as far away as New York City and Philadelphia.

Housing in Oak Ridge: Creating a New "Company Town"

To attract workers, the Army built thousands of housing and dormiatory units at Oak Ridge, and providing shops, cafeterias and laundary facilities for its workers. Oak Ridge, therefore, began as a federally owned and operated company town; Oak Ridge during World War II was owned by the military, which leased housing to workers, and only employees and their families were allowed inside the gates of the city. Outsiders such as union organizers were not allowed inside by the Army. Within the gates, the Army provided entertainment for its workers, and managed the city government.

Though the company town is often thought of as a dying or dead institution by the end of the nineteenth century, it had only disappeared in New England, such as Lowell and other mill areas. In the South and West, the company town was alive and well until after World War II. The new, often remote sites chosen for mining, lumbering, and mill work meant that capitalists had to create a housing stock to attract workers.[11]

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[8]United States War Management Commission, Letter, Sullivan to Tate, June 14, 1943. Series 11, Box 3. Record Group 211, Region 7, National Archives Regional Branch, East Pointe, Ga.

[9]United States War Management Commission, Letter, Ashe to White, July 6, 1943. Series 11, Box 3. Record Group 211, Region 7, National Archives Regional Branch, East Pointe, Ga.

[10]United States Army, Manhattan Engineer District. "Manning of Clinton Engineering Works," January 12, 1944. Series, 66A962, Box 14, Entry CEW 004.04. RG 326. National Archives Regional Branch, East Pointe, Ga. The lengths to which recruiters went to find workers is illustrated by their disregard for WMC regulations. The J.A. Jones construction company, an Oak Ridge contractor, sent recruiters into rural Georgia, Arkansas, Mississippi and Alabama in search of workers, and trucked them North without receiving any clearance from the WMC. Farmers and other employers in these areas filed complaints with the WMC against J.A. Jones for illegal recruiting, particularly in Mississippi and Alabama. In August 1943, WMC officials in Alabama complained that "a Jones construction representative [backed up] a truck on the parking lot at the United States Employment Service office in Mobile, and presumed to load it up with some forty negroes to be transported to a construction job in Knoxville." The Alabama WMC charged Jones with "labor pirating." [United States War Manpower commission, Letter, Klugh to Ashe, August 21, 1943. Region 7, Series 11, Box 3. RG 211, National Archives Regional Branch, East Pointe, Ga.]

[11] The best summary of the full history of the company town is *Margaret Crawford, Building the Workingman's Paradise.* The Design of American Company Towns. (London:Verso, 1995). Other important works on this topic include James B. Allen, *The Company Towns of the American West, 1966.* (Norman: University of Oklahoma Press, 1966). K. Crandall Shifflett, *Coal Towns, Life Work and Culture in Company Towns in Southern Appaalachia, 1880-1960.* (Knoxville: University of Tennessee Press, 1991). For nineteenth century company towns see Jonathan Prude, *The Coming of Industrial Order : Town and Factory Life in Rural Massachusetts, 1810-1860.* (New York : Cambridge University Press, 1983).

The Federal government used this model of the coal and mill village in its public projects, creating its own towns, as part of projects such as T.V.A. The Manhattan Project drew on public and private sector experiences when it created Oak Ridge, seeking to attract workers to the site, while maximizing its control over the city and its residents, and minimizing the building and maintanence cost of the site. Though the Army did not use its town stores to openly steal from its workers, it did seek to maintain tight control over the area around its plants.

However, the image of paternal affection that companies worked for in creating company towns could be shattered by a strike or other worker upsurge. At the slightest sign of trouble, the facilities of the company town were used against workers. In the event of a strike or lockout, the company's image as an altruistic entity, constructed over years or decades, was destroyed forever in the eyes of its workers.[12] Therefore, the company town model, though it promised to help recruit workers and keep turnover low, had the potential for backfiring on an employer, undoing years of work and investment.

Who Was Recruited to Come To Oak Ridge?

Oak Ridge was built in a coal mining area; Tennessee ranked tenth in the nation in coal production, and in Anderson county, 20 percent of the men over age 14 worked in the mines.[13] Many unskilled and production workers at Oak Ridge came from farm and coal communities, both of which had seen economic hard times during the 1930s. Some of those who came to work on the Manhattan Project did so on a seasonal basis, returning to their home community in the summer after the winter at Oak Ridge. Others used the money gained at Oak Ridge to support the farm that they rented to sharecroppers in their absence. Finally, there were aspiring farmers who currently had no land, but sought money through industrial work to pay for their start in farming. Manhattan Project officials understood that their project was not a priority for its own workers, noting that they had to recruit "even farmers in the vicinity who found it necessary to absent themselves frequently in order to keep their farms going."[14]

In her autobiographical novel, *The War at Home*, Connie Green describes her family's journey from coal country, where her father was a mine supervisor, to Oak Ridge, where he worked in a factory. In addition, workers who came from coal communities sought higher wages and steady work. The atmosphere of Oak Ridge, the company owned

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Robert F. Dalzell, *Enterprising elite : the Boston Associates and the World They Made.* Cambridge: Harvard University Press, 1987. Thomas Dublin, *Women at work : the Transformation of Work and Community in Lowell, Massachusetts, 1826-1860.* (New York: Columbia University Press, 1979). Daniel Walkowitz, *Worker City, Company Town: Iron and Cotton Worker Protest in Troy and Cohoes, NY 1855-1884.* (Urbana: University of Illinois Press, 1978). For the twentieth century mill village, see Jacqueline Dodd Hall, *Like a Family: The Making of a South Carolina Mill World.* (Chapel Hill: University of North Carolina Press, 1987). For a representative listing of literature on the topic, see Rolf Knight, *Work Camps and Company Towns in Canada and the US: An Annotated Bibliography.* (Vancouver: New Star Books, 1975).

[12] Stanley Buder, *Pullman: An Experiment in Industrial Order and Community Planning, 1880-1930,* NY: Oxford University Press, 1967. For this transformation in coal towns in Virginia in the 1930s see Harry Caudill, *Night Comes to the Cumberlands,* (Boston: Little, Brown and Co., 1962).

[13]Medical Survey Group, Coal Mines Administration, United States Department of the Interior, "Medical Survey of the Bituminous Coal Industry." March 17, 1947. Washington, D.C.: Government Printing Office, 1947.

[14]Nichols to Chief of Engineers, 20 August 1945. Entry 66A1405, Box 50, Decimal File Man 004.03, "E award folder." RG 326, National Archives Regional Branch, East Pointe, Ga.

housing and long hours resembled coal communities. The most striking difference was that in Oak Ridge, workers' children attended school until age 18, instead of leaving at 14 to work in the mines. For many parents that was the determining factor in relocating to Oak Ridge, rather than remaining in coal mining towns.

Some migrants to Oak Ridge came as an entire family. Colleen Black, who worked in Oak Ridge remembered, "We moved from a two story house in Nashville to a double trailer in K-25 [A mobile home camp for construction workers].... My mother and father and eight brothers and sisters. I was the ninth child. The tenth child was fighting in the Army overseas. That's why we came to Oak Ridge-- to win the war, to bring him home.... My mother had never worked before, but she went down and got a job. My father worked at J.A. Jones, and I worked at Ford, Bacon and Davis, and mother worked at Carbide."[15] For Black, Oak Ridge was a step up for the entire family, as jobs were available for family members above age eighteen.

Some workers migrated from other industrial facilities. Oliver Evans was a production worker originally from Metropolis, Illinois, who served two and a half years in the Pacific with the Army, then came to Oak Ridge to work in the plants, drawn by high wages. He, like many others, remained after the end of the war.[16] Others workers came from Southern industries such as lumber processing. Oak Ridge workers from Mississippi told WMC interviewers that the offer of a higher paying job category brought them North to Knoxville. James Anderson of Philadelphia, Mississippi told the WMC, "I quit working for the lumber company because I was not making enough money to support my family. I made between $20-25 per week."[17] Jessie Red Collins reported, "I quit the lumber company as I asked for a raise, and they wouldn't give it to me. [The recruiter] told me that he would give me 67.5 cents per hour to come to Tennessee to work on a government project." Harvey Hartfield of Carthage, Mississippi explained, "I quit for more money. [The recruiter] told me a government job opened up here at Knoxville and would pay me 67.5 cents/hour and I could get as many hours as I wanted 7 days/week."[18]

Each of the different groups coming to Oak Ridge to work in construction or production came from backgrounds of scarcity and insecurity. While the wartime environment kept workers apart, in the postwar period, this common desire for steady work and higher wages was channeled into union organizing.

Twice Displaced: Women Workers at Oak Ridge

At Oak Ridge, as in other parts of the country during World War II, women moved into industrial work in unprecedented numbers. Unlike other war industries, women at Oak Ridge did not replace men who had done the job before, but were present at the creation of the industry itself.

Oak Ridge companies recruited rural women from the local area for both office and factory jobs. For women from rural backgrounds, these jobs were a significant step up the economic ladder. For many women of rural origin, they were moving both from an agricultural to industrial setting, and from women's unpaid farm and housework to wage

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[15]Colleen Black, Interview by Stanley Goldberg, March 3, 1987, Smithsonian Videohistory Program, Manhattan Project, Session 5, page 59. Smithsonian Archive.

[16]Mel Fiske, "Atomic Workers," *CIO News Victory Edition*, June 24, 1946.

[17]War Manpower Commission, Letter, Robeson to Shackelford, Sept 21, 1943. Box 3, Series 11, Region 7. Record Group 211, National Archives Regional Branch, East Pointe, Ga.

[18]Robeson to Shackelford, Sept 21, 1943. Box 3, Series 11, Region 7. Record Group 211, National Archives Regional Branch, East Pointe, Ga.

factory work. Helen Hall, just out of high school in 1943, took a job at Tennessee Eastman in Oak Ridge because it offered "higher pay than any factories paid in the area" she saw it as a was of "helping the boys."[cite] As textile work was the only other available alternative, Oak Ridge's plants were attractive compared to that low-wage industry. The organized social activities at Oak Ridge, such as weekly dances and movies, gave women far more freedom than they would ever have in a rural, coal or textile town setting. Many of these women would remain after the war, taking permanent jobs with the companies at Oak Ridge or remaining as spouses of men who worked there.

Tennessee Eastman Corporation was the largest employer of local women, and a recruiter recalled that he sought employees from the regions around the facility. Women were hired based on their ability to measure accurately and to recognize basic fractions. As a recruiter remembered, "To hire women Calutron workers, they were asked to find 1/2 inch, 1/8 inch on a ruler."[19] It was assumed that any woman who recognized small measurements could be trained to work uranium separation equipment.

Women whose husbands were unemployed or had deserted them worked at Oak Ridge to support their families. Lillie Phillips was a professional housekeeper at Oak Ridge, cleaning dormitory rooms. On top of this, Phillips kept house for as many as eleven relatives at her home, who passed through Oak Ridge to work, or on their way to other employment.[20] Phillips, the sole wage earner, depended on her job to keep herself and her children afloat.

Other women worked keeping house and finding food and supplies for male and female relatives who worked at the plants, often an entire extended family. As one women told an interviewer about her mother, "It was a full-time job to find food to put on her table."[21] Oak Ridge residents faced long lines for food, laundry and other day to day necessities, adding hours to women's workweek. For women who worked in the plants, the pressures to be at work and to run a home were almost intolerable. Even though Oak Ridge provided a laundry service for workers and their families, and housekeeping services were provided in dormitories, shopping was a full-time job in itself. "An Employed Couple" complained to the Oak Ridge Journal, "If we are on the job from 7 am to 5 PM, as we are requested and urged, when we drive to the trailer camp— all the stores are ready to close. Everything has been picked over until only the worse and sometimes none is left.... If this project's main aim is winning the war, THEN WHY NOT GIVE WORKING COUPLES A CHANCE SO THAT THEY CAN BE ON THE JOB AND HELP GET THIS THING OVER WITH?"[22]

Lack of housing and child care hit women hardest, especially those who were the sole wage earners. Oak Ridge housing policy was sex-biased, viewing women as dependents who were not eligible of their own accord to register for a place to live. Mona Myers, a TEC production worker wrote to the WMC:

> I do know that you have asked us women who could to go to work. I am taking training for a war job at Tennessee Eastman. While in training a representative of our company signed us up for a house. Now that I am in the area they tell me that because my husband does not work for our company I am not eligible for a house, even though I make enough to look after my family. ... My husband is a Southern Railway employee and only home during the weekends, so I have to be home part of each day because I

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[19] Jackson and Johnson Interview.

[20] *Oak Ridge Journal,* November 8, 1945.

[21] Jackson and Johnson, 3/26/76.

[22] *Oak Ridge Journal,* March 1, 1946.

> have two small daughters. ... I don't understand why if we women can do a man's job we can't rent a house. ... If industry is going to do this to women, how can they ask us to leave our homes and families and go to work?[23]

Women played a vital role Oak Ridge's labor force. However, in the social and work world at Oak Ridge, women workers were segregated into low-status, lower paying jobs. The grievances women had within the factories and in the community were, in many ways, greater than those held by men. However, sex segregation kept women apart from other Oak Ridge workers, and the companies, as well as the women themselves, were aware that these wartime jobs for women were considered "temporary," until the plants closed or the men returned from war to take women's place. This segregation and sense of temporary employment undermined women's attachment to unionism, a situation that continued into the post-war years.

Blacks at Oak Ridge

Oak Ridge was segregated by official policy. Since the military owned every store in Oak Ridge and controlled the housing leases, the segregation of public accommodations took place with their permission. The buses, operated on a contract by American Industrial Transit, were segregated by military policy. One white resident remembers that as a small child, he was chased to the front of the bus by a bus driver since he was sitting in the "wrong section."[24] Segregated housing was another officially sanctioned policy in Oak Ridge. At the beginning of the war, black married couples were not allowed to live together. Black women lived in segregated dormitories while men lived in the "Colored hutments." Colored hutments were one small room, had no plumbing, and were rented to four men at a time.

The Manhattan Project did not invent the practice of racial segregation in company towns. It drew both from the experience of coal companies, which if they hired blacks at all, housed them in separate sections of the company town, and of T.V.A., which had housed black workers in separate and substandard housing at dam construction sites in Tennessee.[25] Throughout the region, where agricultural areas might be a checkerboard of white and black farms, industrial housing such as coal and construction villages were strictly segregated by company and Federal policy.

Project administrators defended the practice of racial segregation. One personnel officer recalled that the "government had to attract people to the project with houses near to what they were used to. Black housing was better than what a black worker in Mississippi would have had, while a white scientist wouldn't feel the same way."[26] However, many whites were horrified by both the conditions of the hutments and the top-down imposition

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[23]War Manpower Commission. Letter: Myers to McNutt, August 20, 1943. Region 7, Series 10, Box 11, Tennessee folder. Record Group 211, National Archives Regional Branch, East Pointe, Ga.

[24]Interview with Donald Lane.

[25] Nancy Grant, *TVA and Black Americans: Planning for the Status Quo*. (Philadelphia: Temple University Press, 1990), pages 53, , 55, and passim. K. Crandall Shifflett, *Coal Towns, Life Work and Culture in Company Towns in Southern Appaalachia, 1880-1960*. (Knoxville: University of Tennessee Press, 1991), pages 60-66.

[26]Jackson and Johnson, 4/3/76

of racial segregation. One worker recalled that the "black hutments [were] a real disgrace."[27]

After arriving at Oak Ridge by bus or truck, blacks confronted many of the same problems they thought they had left behind. Promises made during recruitment of higher wages were not always kept, justified by a previously undisclosed racial policy. Lee Crawford told the WMC, "I quit working for the S.K. Fergusen company because [the recruiter] told me that I could make 7 - 8 cents more per hour in Tennessee as a truck driver or tractor operator. Upon arriving here I was told colored people were not allowed to drive trucks."[28] They were assigned the most menial and unskilled tasks— as "common laborers, janitors and domestic workers."[29] A scientist found that Oak Ridge made no effort to "recruit educated blacks for jobs," but looked for blacks to take low-level positions.[30] Blacks were not considered for transfers to higher paying job categories or for promotion by the companies at Oak Ridge.

To understand why African-American workers came to Oak Ridge to get the lowest-paid jobs and to live in segregated conditions, one must examine the context of employment conditions in the region. In her essay about the black community at Oak Ridge, resident Valerie Steele explains that during World War II, blacks at Oak Ridge were receiving "higher pay than they had ever known. For many blacks, the Great Depression years had been ... harsh and forbidding. Life had been a sheer struggle for survival, living on the bare edge of existence. In Oak Ridge, some of these conditions were alleviated, if not eliminated."[31] As one resident told Steele, "Everybody was so glad to have a job making some money. We weren't making money back home."[32] In spite of racism, work at Oak Ridge generally paid much better than did the farm fields and sawmills of Mississippi. Construction laborers made a minimum of 57.5 cents per hour, plus overtime, for a weekly total averaging $38.00. Since this would be a 50% raise for some workers, it was a significant draw northward.[33] In the midst of a South that still clung to sharecropping and domestic service as the major job opportunities for blacks, a high cash wage was the key to greater personal freedom as well as prosperity.

In *City Behind a Fence,* Charles Jackson and Charles Johnson describe the experience of a male black worker who came to Oak Ridge from 50 miles away because of a strike at the Alcoa aluminum plant. The man explained, "I just wanted to work."[34] However, he found that racial segregation was more pronounced than in his old community

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[27]Jackson and Johnson, 5/1/76.

[28]War Manpower Commission. Letter: Robeson to Shackelford, Sept 21, 1943. Region 7, Series 11, Box 3. Record Group 211, National Archives Regional Branch, East Pointe, Ga.

[29]Valeria Steele, "A New Hope" in *These Are Our Voices,* (Oak Ridge: Oak Ridge Children's Museum, 1987), page 200

[30] Jackson and Johnson Interview.

[31]Valeria Steele, "A New Hope," page 199

[32]Valeria Steele, "A New Hope," page 199.

[33]United States War Manpower Commission. Letter: Garner to United States Employment Service, October 18, 1943. Series 3, Box 10, Folder C530.2. Record Group 211, National Archives Regional Branch, East Pointe, Ga.

[34]Charles Jackson and Charles Johnson, *City Behind A Fence.* (Knoxville: University of Tennessee, 1981), page 212.

of Maryville, and that the job opportunities, "janitor or laborer," were the same as anywhere else in the South. His wife remained behind at Maryville, since the hutments "just wasn't no fit place" for her to stay. Fighting and theft were common in both black and white dormitories, and there was only one cafeteria in which blacks were allowed to eat. After the war, his wife and he found a small house in Oak Ridge, and settled there. He told the authors, "She likes it and I like it, and we bought two lots to be buried here."[35]

This story of this black worker at Oak Ridge is remarkable in several respects. The narrator lacks the kind of bitterness one might expect in such a situation. The affection for Oak Ridge seems out of place, since it never provided the worker with anything beyond the lowest job possible. However, the frame of reference this man has are important to keep in mind. One of his goals at Oak Ridge, he says, was not "getting into trouble" with the law. With a family to support, "I just made up my mind I wasn't going to no jail."[36] Since this man's goal was to avoid becoming a victim of the Southern criminal justice system, and to earn a living for his family, Oak Ridge lived up to his expectations.

The experiences of black workers predisposed them to unionism for two reasons. Blacks were at the bottom of the occupational ladder at Oak Ridge, but their jobs in loading, transport and maintenance were connected to the factories in which they worked. Though there was social and employment segregation, black and white workers came into daily contact with each other on the job. In addition, black workers came to Oak Ridge for steady, long term work. They sought a foothold in the factories and the community, as many perceived that they had no better alternative. Workplace contact between blacks and whites, and black workers' desire for steady, secure employment, led them to engage in postwar unionization efforts unlike women workers.

Conclusion: Promises Kept and Broken

The recruitment strategy of the Manhattan Project reveals two key facts: First, Oak Ridge recruited most of its workers through non-wage incentives and promises that made industrial work at Oak Ridge more appealing than the farm or factory work left behind. Second, in the postwar years, workers viewed these recruitment strategies as unkept promises, encouraging labor organizing at Oak Ridge around the issues of housing, steadiness of work, and wages. When, at the end of the war, the Army sought to raise rents, lay off unneeded workers and trim social programs, workers viewed these actions as the breaking of the promises that had brought them to Oak Ridge. Thus, in the recruitment strategy of the Manhattan Project lay the seeds of its future unionization.

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[35] Charles Jackson and Charles Johnson, *City Behind A Fence*. (Knoxville: University of Tennessee, 1981), page 213-4.

[36] Charles Jackson and Charles Johnson, *City Behind A Fence*. (Knoxville: University of Tennessee, 1981), page 213.

In spite of the restrictive community and workplace regulations described in the last chapter, Oak Ridge was not entirely free of workplace conflict. Like the rest of America's workers, employees at Oak Ridge wanted America to win the war and worked to support the war effort. However, they also faced a conflict between their support of the war and the grievances with their employers. After Pearl Harbor, most Americans viewed strikes as unpatriotic; moreover, top union leaders had made a "no strike pledge" for the duration of the war. However, to ignore conflicts over wages, hours and working conditions was against all traditions of trade unionism.

Workers all over America faced the same problems. The NWLB's wage control meant that salary increases were limited to the rate of inflation for the duration of the war, undermining the workers' bargaining leverage in a tight labor market. Under pressure to produce for wartime, many companies sought to return to piecework and incentive pay scales rather than the hourly and daily pay rates won by workers in the 1930s. Management sought to retake the control of the shopfloor that it had lost in the 1930s, and attempted to reassert its power to discipline and fire workers at will.

Nationwide, conflicts over wages and job control led to an unprecedented number of wildcat, or unauthorized, strikes by workers during the years 1944 and 1945. Many of these actions were "quickie" strikes lasting less than a single shift, often focused around one shop issue, such as work speed or a problematic foreman. None of these strikes were authorized by labor union officials, and in some cases, union officials were dispatched to discipline the strike's leadership and convince the men and women to return to work until the problem could be settled.

Unlike other cities, the Army controlled Oak Ridge, controlled the community and through its contractors, managed the city's workforce. The structure of labor policy at Oak Ridge kept most workers on the job for the duration of the war- less than .x% of workhours were lost to strikes. Those workers represented by unions at Oak Ridge, mostly building trades, were not backed by their unions in case of strikes or labor disputes, as the International unions had pledged not to strike during the war.

Workers at Oak Ridge did not acquiesce to the militaty's dominance of the workplace and city; Even though many workers lacked effective representation, they engaged in collective action to achieve their goals. Though these actions were not always effective, and in some cases led to a dismissal of all participants, this activism laid the groundwork for postwar labor organizing at Oak Ridge. The wartime struggles in the workplace carried out by small groups of workers can best be seen as a series of rehearsals for the wider postwar struggles to organize Oak Ridge. However, for the duration of the war, the struggle for control in the workplace was limited to the plants and the construction sites. Only with the war's end was the conflict over labor at Oak Ridge is made part of the community's struggle for self-determination.

Workers and World War II: A Mixed Legacy

Contrary to national memory of World War II as a time of social consensus on the home front, the years 1942 to 1945 represented a high point in American strike activity. Across the nation, workers walked out of their jobs over issues of pay, shop-floor control and frustration with long hours and poor working conditions. Scholars have debated the meaning of this strike wave for the past two decades. Labor historian Nelson Lichtenstein, in his *Labor's War at Home,* describes the strikes as the product of shop floor grievances that the labor bureaucracy ignored. At the forefront of these strikes was "the organic leadership" of factory workers; the issues of these strikes emerged from "rank and file militancy [that was] rooted in the concrete social and technical structures of the factory workplace." These striking workers did not view themselves as being against the war effort. Instead, many workers supported the no-strike pledge in principle, but felt that,

when pushed too far, they had a right to strike in defense of their rights. This led to a "divided consciousness," between feelings of patriotism and those of grievance, that workers alternated between during the war.[1]

Other labor historians view the wartime strikes less positively. Labor historian Joshua Freeman writes that strikers were mostly "green hands," new to industrial work and that their strikes were "spontaneous, unchanneled, uncoordinated and untempered by larger union or political concerns." According to Freeman , wildcat strikes were mostly over wages and hours – the product of individual greed rather than worker solidarity. Many walkouts, especially those in northern cities such as Detroit, were racially motivated, as workers walked off the job with the promotion of blacks to production line or skilled positions. The real business of labor during the war, according to Freeman, was "delivering the goods" to the soldiers at the front fighting the Nazis and Japanese, not striking for higher wages or an all white workforce.[2]

The evidence of worker activism at Oak Ridge supports Lichtenstein's conclusions in several respects: workers who walked off the job during the Second World War were the most experienced unionists, and their demands were primarily about issues of working conditions and job control, not primarily over wages or hours. To understand the causes, dynamics and results of worker activism during this period, we need to explore the labor and workplace policies of the Manhattan Project and its employers. Therefore, I will first describe the formulation of the Manhattan Project's labor policy at Oak Ridge, and the ways in which this policy was implemented in the workplace by project contractors. Next, I will examine forms of workplace resistance to these policies, in a range of forms, not simply strikes. These forms of resistance include absenteeism, turnover, conflicts over the definition of worker "efficiency," and finally, strike actions (as well as threatened strike actions) by workers. Finally, I analyze which workers went on strike during this time period, and why some groups of workers were successful in their actions, while others failed.

The Labor Policies of the Manhattan Project

General Groves's management of labor was as vital to the Manhattan Project's success as was the coordination of science, engineering, raw materials and supply. He faced several difficult problems in formulating a labor policy. Although the Manhattan Project sought to forestall union organization in Oak Ridge's plants, labor shortages on the American home front meant that the Project required the aid of labor unions to recruit skilled workers. In addition, Groves and the management of Oak Ridge's contractors wanted to maximize the efficiency of workers, but in a tight labor market it was difficult to discipline or fire workers who could simply move on to another high paying job.

General Groves's own attitude towards labor can be seen in his siting of Oak Ridge. Groves was looking for a site in an isolated part of the nation, rich in electric power and water resources, and inland from the coasts. However, he was also looking for "friendly," meaning nonunion, territory, according to one biographer.[3] In siting the Oak Ridge facility, Groves had only to contend with local Knoxville A.F. of L. unions, rather than the rising C.I.O. unions found in the Northeast and Midwest. However, one should not believe that Groves's desire to avoid unions in his facilities meant that he did not take a pragmatic orientation towards them. As the Manhattan District official history shows, the

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[1]Nelson Lichtenstein, "Auto Worker Militancy and the Structure of Factory Life, 1937-55," *Journal of American History*, 67:2, 335-53, page 53.

[2]Joshua Freeman, "Delivering the Goods: Industrial Unionism During World War II," *Labor History Reader*, 383-406, at 401.

[3]William Lawren, *The General and the Bomb*, (New York: Dodd Mead, 1988).

project utilized skilled labor unions in recruiting members, especially in fields such as pipefitting, plumbing and electrical crafts where the war created unprecedented labor shortages.[4] The problem of constructing a labor policy that would include unions when needed and exclude them from the plants was undertaken by Groves and John Ohly, an officer with the Army Service Forces who was an expert in labor relations.

Conflicts in Labor Policy

General Groves had "autocratic" views of the role of labor in the Manhattan Project; he sought to channel and control labor much as he sought to buy and direct the flow of raw materials. For Groves, the complex system of the Manhattan Project required a strong central manager (himself) who could send orders directly from Washington to the construction site at Oak Ridge. David Noble, in "Command Performance: A Perspective on the Social and Economic Consequences of Military Enterprise," describes Groves's style perfectly: "The military term for management is command, a rather straightforward notion that means the superior gives the orders and the subordinate executes them, no ifs, ands, or buts."[5]

However, Groves did not create labor policy for Oak Ridge alone. The War Department sent John Ohly, an officer with the Army Service Corp, to help Groves create a labor policy for Oak Ridge. Ohly, an expert in industrial relations, confounds the traditional picture of military officials as autocratic. Instead, Ohly was from the "human relations" school of management, and wanted to make workers at Oak Ridge content with their wages, working and living conditions, in order to forestall union organizing.

The conflict between these two men and their perspectives on labor policy is revealed in the 1944 policy debate over the role of unions at Oak Ridge. This debate reveals that there was no one military "style" of labor relations during World War II; autocratic and human relations schools of management both existed in the military, as they did in industry.

Labor Policy at Oak Ridge: Command or Cooperation?

In November, 1944, Groves described his goals of Manhattan Project labor policy at Oak Ridge in terms of expediency and security. He wrote that most important were:

> Getting out the production required in accordance with schedules.... Safeguarding the operation from sabotage or other subversive interference, and preventing the disclosure of any information [that] ... might benefit a foreign power. ... Obtaining the highest degree of efficiency and economy of operations.

Groves wrote that unions would make these goals impossible to meet. He noted that "If unions are permitted to exist on the project, a whole series of difficult problems arise which could be avoided if unions were not present." Problems included possible breaches of security, jurisdictional disputes, possibility of strikes, union control of hiring, "organizational activity which may be disruptive to production," and the flow of information to international union officers.[6]

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[4]Jones, page 354.

[5]David F. Noble, "Command Performance: A Perspective on the Social and Economic Consequences of Military Enterprise," in Merritt Roe Smith, ed., *Military Enterprise and Technological Change*, (Cambridge: MIT Press, 1985), page 333.

However, Groves's most important objection was that unions would lead to breaches in security. He wrote, "if unions are permitted, there will be union meetings which will be a hazard to security. ... Union meetings are more dangerous because they may bring together people engaged in related work and who are likely to talk about their work." These meetings would need to be "controlled in the same fashion as the meetings of all other organizations on the project." Therefore, due to production and security concerns, he suggested barring union organizing at Oak Ridge for the duration of the war.[7]

John Ohly recommended a different strategy to the War Department. First, he noted that workers possess "the right to join a union" under the Wagner Act and that "this is a clearly established right to which there are no exceptions." This right to organize would be enforced by workers themselves, as "this right to join unions is the most zealously guarded right of organized labor, in fact its foundation stone, and the War Department would be unrealistic to attempt openly or secretly to abrogate it." Ohly wrote, "There is no practical way, short of discharge or exclusion from the project, in which the War Department can prevent men joining, or organizing themselves into unions, if they really wish to do so." Firing union members or driving them off the project grounds would also be dangerous because "the only effect ... would be to drive any union underground or force it to carry on its meetings off the project ... From a security standpoint it would be far more difficult to control in any fashion."

Ohly did not believe it would be necessary to exclude unions from the project, if "living and working conditions on the project, and wage rates, are such that there may be a lack of incentives for workers to band together." He recommended that "continuance of the best possible conditions, including the application of the fairest possible grievance procedures, ... would make the general development of unions unlikely." Ohly, therefore, thought that high wages would keep grievances down, postponing union development.

In late November 1944, Groves contacted the heads of the different plants at Oak Ridge about the possible impact of unions in the factories. On November 27, 1944, Groves spoke to Clark Center, K-25 plant manager for Carbon and Carbide Chemicals, who told him, "We feel unionization would slow up the job, but [we are] not antagonistic to unions." A Tennessee Eastman official told Groves, "On this particular job there would be immediately some delay in work, but [it would] hard to tell long run effects."[8] Thus, the officials at the two main contractors at Oak Ridge were willing to accept unionization of workers under the condition that it would not cause delay to the Project.

Groves decided to recognize and negotiate with union affiliated A.F. of L. construction unions, as they were needed to recruit skilled construction workers. Production workers who manned the factories at Oak Ridge, however, would be prevented from organizing unions. Groves justified this decision on two grounds. First, he assumed that "95 percent of construction workers never come in contact with classified information or materials, whereas the converse is true with production workers." More importantly, however, there was the fact that "the construction workers who came to the project ... were already union members organized into strong unions, and the unions were themselves instrumental in staffing the ... project."

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[6]United States Army. Manhattan Engineer District. John Ohly, "Formulation of Labor Policies to Govern Operation of C.E.W." November 10, 1944, Folder 80, Harrison-Bundy Papers, National Archives, Washington, D.C.

[7]United States Army. Manhattan Engineer District. John Ohly, "Formulation of Labor Policies to Govern Operation of C.E.W." November 10, 1944, in Folder 80, Harrison-Bundy Papers, National Archives, Washington, D.C.

[8]Leslie Groves, Diaries of General Leslie Groves, November 27, 1944. Groves Gift Collection, RG 200, National Archives, College Park, Md.

Groves asked the National Labor Relations Board to postpone action on any workers' requests for official union recognition. At the same time, Groves asked top AF of L, CIO and United Mine Workers officials to keep local unions from organizing in the plants at Oak Ridge. On November 29, 1944, Groves learned that his request to postpone NLRB action on unions at Oak Ridge had been granted - the NLRB would not process worker petitions for unions for the duration of the war.[9] In December 1944, Groves learned that District 50, the United Mine Workers' organization for industrial workers, "had tried to get in the area but without success and as far as we can ascertain there hasn't been any [District 50 activity] on the project at all."[10] Thus, the labor strategy adopted by Groves included postponement of union organizing, obstruction of NLRB procedures and a quarantine of workers at Oak Ridge from the influence of union organizers.

Workers' Response to Project Labor Policies

The Manhattan Project sought a work force that would work quickly and efficiently to produce a maximum of atomic materials at a minimum of cost. Workers had a strong desire to help the war effort through their work, but came into conflict with the project. Many of these jobsite conflicts have been lost to history, due to the fact that little notice was paid to routine workplace disagreements over the pace of work or the rate of pay. Project records demonstrate that workers left the job or did not show up to work, in part to protest job conditions or pay rates. These records also show that workers and managers clashed over the meaning of "efficiency" on the job. There is also extensive and detailed evidence of worker resistance to military and management authority in the Labor Diaries of the Manhattan Project, which reported daily on any strikes, threatened strikes, and problems with staffing. All of these pieces of evidence demonstrate that the project's workers were far less quiescent than official histories have portrayed them.

Absenteeism

No discussion of worker resistance to managerial control of the workplace would be complete without a discussion of absenteeism. Absenteeism and labor turnover plagued the management of the Manhattan Project. Both the Army and its contractors realized that turnover and absenteeism were problems caused by worker dissatisfaction with their jobs and with Oak Ridge living conditions. Though some workers came with the intention of staying indefinately in Oak Ridge, many used Oak Ridge as a source of ready cash or a stopping place on the way further north, frustrating the project leadership with high absentee and turnover rates. Groves noted on July 20, 1943, that the "common labor" situation had "taken a bad curve again due to absenteeism."[11] These chronic shortages prompted Groves to consider using prisoners, Italian prisoners of war, and Mexican braceros as labor for the project. Notably, Groves rejected these options due to problems of housing, rather than on ethical grounds.

Schulman Electric, whose electricians had a 35 percent absentee rate, required employees to fill out cards recording their reasons for absence and were told they would be fired if the reason listed was not satisfactory. The company reported to the District that the

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[9] Leslie Groves, Diaries of General Leslie Groves, November 29, 1944.Groves Gift Collection, RG 200, National Archives, College Park, Md.

[10]Leslie Groves, Diaries of General Leslie Groves, December 12, 1944. Groves Gift Collection, RG 200, National Archives, College Park, Md.

[11]Leslie Groves, Diaries of General Leslie Groves, July 20, 1943. Groves Gift Collection, RG 200, National Archives, College Park, Md.

top three causes of absence were, "1. Sickness of the person or of his family, 2. Business, 3. Visits to home or relatives." These responses highlight the official explanations for absenteeism at Oak Ridge — whether accurate or not — it is clear that workers would not make the total commitment to the project that was needed.[12]

The overall turnover for the project was high; most workers passing through Oak Ridge stayed for less than one year, in spite of labor shortages there. This would indicate that workers were less satisfied with Oak Ridge, relative to opportunities elsewhere, than official histories would have us believe.

The MED countered with a "presenteeism" campaign in which companies and their workers would win recognition for the highest percentage of men present each day on the job. This campaign involved encouraging workers not to take time off, and shaming as unpatriotic those with poor attendance records. The District Engineer's office suggested to one construction company that another contractor had good results when "men are terminated who habitually absent themselves during the week but report for work on premium days," and when weekly War Bond raffles were held, only those with good attendance records were eligible.[13] The William Pope Company, stressing that workers were soldiers on the home front, hung signs that pictured a timeclock stating, "This is your bazooka! Don't fail to use it! Stay on the Job!"[14]

Workers and Bosses Define Efficiency

Even when workers were not absent or had not quit, managers found it difficult to convince them to submit to direct management control. Manhattan Engineer District Industrial Relations records from the period detail daily struggles between managers and employees over their rights. Most conflicts focused on the competing definitions of efficiency. These conflicts reveal that skilled workers at Oak Ridge had more control over their work than might be expected in a militarized and regimented workplace, and that during the war, this control was contested by management who sought to impose a new discipline on workers time.

Manhattan District leaders and contractors designed and implemented an efficiency campaign to change work practices, giving management more control over the skilled workforce. Though workers were asked to give their input into the campaign, it was run entirely by the contractors and the military with their own purposes in mind. The conflict lay in the meaning of the term "efficiency." Workers submitted ideas to the campaign that stressed positive reinforcement and also encouraged the Army bureaucracy to be more responsive to workers' needs. Sven Ekhalm, a cable splicer on the project thought that "service ribbons" for three or six months of uninterrupted war work would help boost morale and would serve to shame "slackers" into better attendance.[15] Workers at the A.S. Schulman Electric Company wrote that "improvement of food in the cafeterias" and "simplifying the procedure for obtaining tires and gasolene from the rationing board" were

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[12]Schulman Electric Company, "Absenteeism Report," July 14, 1944. Entry 66A962, Box 14, Decimal File CEW 004.04 "Industrial Mobilization," RG 326, National Archives Regional Branch, East Pointe, Ga.

[13]William Cornelius to W.C. Brandan, July 28, 1944. Entry 66A962, Box 14, Decimal File CEW 004.04 "Industrial Mobilization," RG 326, National Archives Regional Branch, East Pointe, Ga.

[14]Pope to Foremen, July 10, 1944. Entry 66A962, Box 14, Decimal File CEW 004.04 "Industrial Mobilization," RG 326, National Archives Regional Branch, East Pointe, Ga.

[15]Sven Ekholm memo, July 14, 1944. Entry 66A962, Box 14, Decimal File CEW 004.04 "Industrial Mobilization," RG 326, National Archives Regional Branch, East Pointe, Ga.

high priorities for increasing efficiency. For workers, efficiency meant that the system should be arranged to cut red tape and improve services.

Contractors defined efficiency in terms of restrictive measures against workers. A.S. Schulman Electric Company, as part of its efficiency plan, told the men that "idleness, loafing and unexcused absences will be reason for discharge for cause."[16] Stone and Webster construction company reported that "supervisors and foremen have been instructed to discharge loafers. An examination of termination records for the project shows that loafers and undesirables are being weeded out."[17] The director of Clinton Laboratories told the District Engineer's office of "our intent to dispense with the services of inefficient personnel."[18] In 1944, District recruiting efforts picked up in an attempt to have more employees with which to replace those fired.[19]

The Schulman company instituted a policy of "spot checks ...to insure maximum efficiency and organizational balance," and instructed foremen to "weed out inefficient personnel who will not respond to instructions and will not put forth an effort to turn out a reasonable days work."[20] A company letter to employees let them know that "avoidable absenteeism is sabotage at its worst" and that "loafing, inefficiency and time-killing will be cause for dismissal... An employee terminated for cause may not be re-employed at the Clinton Engineer Works."[21] Every moment was of concern to the efficiency campaigners. As part of the campaign, James A. Jones Construction Company shortened their cafeteria hours in the morning to prevent eating on the job, and checked to make sure that employees ate their lunch quickly.[22]

The differences between what managers and workers viewed as efficient was a major cause of conflict at Oak Ridge. Workers defined efficiency as methods that increased their ability to work as they saw fit. Managers viewed efficiency as heightened measures of control that would restrict workers' actions.

Control on the Job

The nature and conduct of the efficiency campaigns at Oak Ridge demonstrates two points. First, the companies used efficiency as a way to reduce the workplace control of skilled workers. Second, and more importantly, these campaigns demonstrate that skilled trade workers had substantial control on the job prior to the campaign.

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[16]Wikle to District Engineer, July 26, 1944. Entry 66A962, Box 14, Decimal File CEW 004.04 "Industrial Mobilization," RG 326, National Archives Regional Branch, East Pointe, Ga.

[17]Williams to District Engineer, July 31, 1944. Entry 66A962, Box 14, Decimal File CEW 004.04 "Industrial Mobilization," RG 326, National Archives Regional Branch, East Pointe, Ga.

[18]Whitaker to DE, July 25, 1944. Entry 66A962, Box 14, Decimal File CEW 004.04 "Industrial Mobilization," RG 326, National Archives Regional Branch, East Pointe, Ga.

[19]Manning of CEW, 12 January 1944. Entry 66A962, Box 14, Decimal File CEW 004.04 "Industrial Mobilization," RG 326, National Archives Regional Branch, East Pointe, Ga.

[20]Wikle to District Engineer, Enclosure. Entry 66A962, Box 14, Decimal File CEW 004.04 "Industrial Mobilization," RG 326, National Archives Regional Branch, East Pointe, Ga.

[21]Wikle to District Engineer, Enclosure. Entry 66A962, Box 14, Decimal File CEW 004.04 "Industrial Mobilization," RG 326, National Archives Regional Branch, East Pointe, Ga.

[22]JA Jones to District Engineer, July 16, 1944. Entry 66A962, Box 14, Decimal File CEW 004.04 "Industrial Mobilization," RG 326, National Archives Regional Branch, East Pointe, Ga.

H.V. Appen, a project manager for J.A. Jones Construction Company, described some of the barriers to maximum efficiency: "There is entirely too much loafing on the job. ... Very few men actually start on time... Their main thought seems to be to punch the time clock before the whistle blows. We must remind them that the whistle blowing means for the men to start work and not rushing through the clock aisles. ... Men are quitting ahead of time, in order to get a front seat next to the clock aisles at punching out time. ... Believe it or not, every day we are finding men asleep on the job, on government time and government pay."[23]

Appen actually had to tell his compressor operators that they "will refrain from lying down at and around their compressors, and will try to assume a vertical position as much as possible."[24] Attempts to control work and work pace applied to lunch as well. Appen told his truck drivers to discontinue "giving rides to a great number of workmen before or at lunch time to the several cafeterias," as the men should instead bring their lunch with them in order to save time on the job.[25]

Appen's memo to the men on January 18, 1944 reads:

> Conditions at the project make it again necessary for the following rules and regulations to be reiterated...
>
> 1.There is positively not to be any gambling ... during work time
>
> 2. There will be positively no drinking of intoxicating liquors of any shape, type or kind.
>
> 4. The lunch period on this project is from 12 to 12:30... Workmen [need to] carry their own lunches.
>
> 5. Warming fires are to be kept to a minimum...
>
> 6. A full day's work is mandatory and we will positively not tolerate any more loafing on this project.
>
> ... Repeated violation of the above will result in discharge for cause, without release."[26]

These rules, presumably created to address existing problems, illustrate that workers viewed their work time as a combination of labor and leisure time. Since many workers were putting in 10-12 hour days and 6 day weeks, this should not be surprising that work would not be viewed as nonstop. These rules suggest that work at many Oak Ridge worksites was an alternation of hard work and leisure, in which workers viewed themselves as on call, but did not feel obliged to keep up contant activity. It is a remarkable document in that it expresses the tension between managerial control and the drive for efficiency, and the fact that labor shortages made it difficult to fire skilled and unskilled workers.

Wildcat Strikes

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[23]Appen to All Foremen, June 16, 1944. Entry 66A962, Box 14, Decimal File CEW 004.04 "Industrial Mobilization," RG 326, National Archives Regional Branch, East Pointe, Ga.

[24]Appen to Superintendents, May 27, 1944. Entry 66A962, Box 14, Decimal File CEW 004.04 "Industrial Mobilization," RG 326, National Archives Regional Branch, East Pointe, Ga.

[25]Appen to Truck Drivers, April 7, 1944. Entry 66A962, Box 14, Decimal File CEW 004.04 "Industrial Mobilization," RG 326, National Archives Regional Branch, East Pointe, Ga.

[26]Appen, Notice, January 18, 1944. Entry 66A962, Box 14, Decimal File CEW 004.04 "Industrial Mobilization," RG 326, National Archives Regional Branch, East Pointe, Ga.

In the official histories of the Manhattan Project, workers do not resist the Army's policies in the workplace. Vincent Jones's *Manhattan: The Army and the Atomic Bomb* states, "Perhaps the most concrete evidence of the effectiveness of the project's labor policies was the almost complete absence of work stoppages from late 1944 to the end of the war. Manhattan Production plants had lost only about 86 thousand man hours, or about .028 percent of their potential working time, as a result of work stoppages."[27]

The record of Manhattan Project walkouts indicates that skilled construction workers struck far more often (31 times) than those involved in production (1). Secondly, the skilled trades within the construction field participated in more actions (25) than unskilled laborers (7). Unions such as the Plumbers (6), Carpenters (5), and Electricians (4) struck the most often, indicating that it was skilled crafts, and especially those in highest demand, who felt able to walk out with confidence that they would not be fired for their action. The image of the green worker who is interested only in high wages and racial exclusivity is not substantiated at Oak Ridge, where it might be expected to be even more prevalent than in northern cities.

The reasons for the walkouts given in the records indicate that these skilled craftspeople demanded more than simply the highest wage they could get. Complaints over wages and hours accounted for only 8 strikes (25 percent of actions) during the war years. Conflicts over supervision and discipline were, in fact, the leading cause of disputes, with 9 walkouts. Questions of jurisdiction and the closed shop caused 7 disputes, and layoffs and working conditions led to 4 work actions each. Records show that skilled, not unskilled workers, were the backbone of resistance to managerial authority at Oak Ridge, and that wages were not the primary issue of the majority of strikes.

The Determinants of Wildcat Action

There are four factors that separated the workers that struck the Manhattan Project from those who remained on the job. These were the leverage possessed by workers due to their skills and the difficulty of replacement, the solidarity of group work, the position in the technological process, and prior union identification. These factors, similar to those found by James Zetka in his study of wildcat strikes in the auto industry, help explain why construction workers on the project struck far more than production workers, and why workers assigned to monitoring the uranium enrichment process did not strike at all.

Machinists were unionized prior to the project, worked in groups and were in high demand at the project. Therefore, they were able to bring forward demands for control of their work with more success than other workers. In August 1945, a group of machinists at Tennessee Eastman Corporation [TEC] in Oak Ridge walked out over issues of time and work control. According to Manhattan Project records, "TEC machinists in building 9766 (Processing laboratory) went out on strike this morning between 0900 and 0930. They gave as their reasons two grievances: 1. they are tired of waiting for a decision as to whether their hours are to be changed back from 08:15 to 17:00 to 07:15 to 15:45, and 2. They are of the opinion that they were allowed 15 minutes, morning and afternoon to clean up and change clothing, but they were docked yesterday for taking this usual period" (1 August). The Army promised to resolve the issue the next day and workers agreed to return to the job, so long as they set the hours of work.

Unionized pipefitters and welders were another group that used their important position on the project and their group solidarity in order to win better working conditions. Working in an unventilated building in the heat of a Tennessee August, they walked off the job in protest over the lack of fans. This strike defied both the Manhattan Project policy of

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[27]Jones, page 376.

no interruptions in construction work and the "no strike pledge" given by the union in recognition of wartime exigencies. The company had previously promised to install fans to ventilate the work site. On August 3, 1945, with no fans forthcoming, workers picked up their tools, clocked off the job, and went home, telling the company that they would not return until the fans were installed. Their union representative telephoned the Manhattan Project office at Oak Ridge, and relayed the news of the walkout. The Project officials then ordered the contractor to install the fans that night, in order that work could resume the next morning.

With the fan installation, the pipefitters and welders agreed to return to work the next morning, and maintained that, in fact, there had never been a walkout at all, and that the men had simply clocked out early to allow for installation of the fans. The men followed all of the rules of the company, down to clocking out before leaving, in order to demonstrate that they were not intentionally disrupting the project. However, they insisted that the company keep its promise of better working conditions, and called upon the greater authority of the military to enforce that promise.

These two examples indicate that wildcat walkouts during the project were attempts by workers to gain greater control over the conditions and terms of labor. Unlike accounts of wildcat strikes that stress their uncontrolled nature, these actions indicate not only purposeful collective action, but also a strong sense of what E.P. Thompson called "moral economy." In the case of the welders and pipefitters, the situation was not presented to management as a walkout, but as an orderly and routine clocking out.

The only walkout by workers in production facilities was by International Brotherhood of Electical Workers craft workers who objected to the dismissal of one of their members. Electricians in the Oak Ridge powerhouse, who considered themselves part of the I.B.E.W., requested that their union be recognized by their employer, Carbon and Carbide Chemical Corporation. They were told that, as production workers, they could not organize due to security reasons, but that they would be recognized informally by the company and would have access to a grievance procedure for their complaints. The union found its requests for an officially recognized shop steward blocked by the company's argument that it would violate "security regulations." A union official, however, found this reasoning "absurd, since the manner in which power is produced is more or less standardized the world over," and, "Any janitor can glance up and see how much total load is produced," as the instruments were out in the open.

When the electricians charged that company personnel were biased against union members, one was fired shortly thereafter. Fourteen men walked off the job, and all were fired by the company for their actions. One union member wrote in protest to the Manhattan District, "The War Department requested the IBEW to postpone the [NLRB] hearing since the War Department believed the publicity of the court proceedings would jeopardize the security of the Clinton Engineer Workers [Oak Ridge]. The IBEW members at the plant, being good American citizens and 100 percent behind the war, instructed their representative to comply with the request of the War Department." However, the company had "taken advantage of our patriotism, since we have postponed our legal rights in the matter because of patriotic reasons."

This example demonstrates that for workers in the atomic factories, unprotected by unions or the NLRB, resistance to Manhattan Project and company labor policies was difficult to organize, and even more difficult to sustain. Workers fired for participating in wildcat strikes were expelled from their housing at Oak Ridge, blacklisted from working at other contractors in the area, and had their draft deferments revoked. The fact that workers struck at all in these conditions is quite remarkable, considering the consequences involved: losing one's job, house, and possibly being sent to fight in the Pacific.

The record of workplace activism during the Manhattan Project demonstrates that workers were never as compliant as the official history suggests. Instead, workers fought for their rights as unionists and citizens whenever possible. The groups who were able to

resist most effectively had previous union experience, worked in groups, and possessed skills that made replacement difficult.

Worker resistance at Oak Ridge also demonstrates the "divided consciousness," as workers and citizens, that characterized workers in World War II America. Workers viewed themselves both as dedicated patriots involved in important war work, and as workers whose rights were violated by heavy handed management. As Leslie Carr wrote after his dismissal for strike activity at Oak Ridge, workers felt that their patriotism had been exploited for the private interests of corporations and military officials. This conflict would not come to an end at Oak Ridge with the close of the war. Instead, this dialectic of patriotism and worker activism would remain at Oak Ridge until the present, with both ideas competing for workers' allegiances.

Chapter 4: Work Structure in the Plants at Oak Ridge: Work Experience and Radiation Safety at Oak Ridge During the Manhattan Project

Introduction

At first view, the atomic factories at Oak Ridge would seem to be Frederick W. Taylor's dream come true. In Oak Ridge's uranium processing and separation plants, work was divided into the smallest units possible, and these steps were brought together into an automated process. Workers only knew about their small part of the production process, and did not even know what the final product of their labor was. When Frederick W. Taylor wrote *Principles of Scientific Management* in 1911, he wrote that knowledge of the production process was management's monopoly, and that work should be divided into mental and physical components; the worker needed to know nothing about the job except his specific task and the manager would present these task in simplified diagrams. This management technique took away the "shop knowledge" that workers could use as leverage over their bosses, and reduced workers to efficient drones.[1]

Harry Braverman, in *Labor and Monopoly Capital*, wrote that Taylorism revolutionized industry, destroying the craft system of work, and "deskilling" the workplace. Scholars from sociology, history of technology, and labor studies have debated the "Braverman thesis" ever since, finding that some industries have indeed been deskilled by automation, while others, although highly automated, have remained dependent on skilled workers.

At Oak Ridge, the highly divided and compartmentalized system of labor had different effects than the Braverman thesis would have predicted. The uranium separation process, though highly automated, did not lead to a de-skilled workplace. Instead, as managers and scientists recognized, production workers at Oak Ridge were highly skilled in the tasks they did, more so than the scientists who worked on the equipment previously. However, the Army and the contractors, through division of labor and compartmentalization of information, were successful in keeping workers ignorant of the purpose of their job and the hazards of the materials and processes they worked with. The military security system at Oak Ridge insured that workers did not talk or organize around workplace issues. At Oak Ridge, the structure of work created a labor force that was both highly skilled and powerless to change their workplace.

The Taylorized work process at Oak Ridge and the compartmentalization and security system therefore had the effect of separating two aspects of "skill:" technical know-how and autonomy over work pace and conditions. The image of the nineteenth century skilled worker that David Montgomery has given us no longer applies in World War II Oak Ridge. Even the most skilled machinists at Oak Ridge, who had great craft skill in the traditional sense, had no knowledge of many of the substances they were called upon to machine. The component of skill that came from knowledge of the materials involved in production had been transferred from the skilled workers to the scientist and engineers, who did not let this information trickle down to the workers.

In this chapter, I examine the implications of the military's Taylorized work structure at Oak Ridge. In the first part of this chapter, I describe the work environment of the factories at Oak Ridge and the ways in which the work process was divided at Oak Ridge, but was not de-skilled. In the second part of the chapter, I discuss what was known about the dangers of radiation at the time of the Manhattan Project, and how the standards for radiation exposure were set. In the final part of the chapter, I present a case study of a single building at Oak Ridge, and the hazards that workers were exposed to as a result of wartime production pressures.

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[1] Harry Braverman, *Labor and Monopoly Capital*, (New York: Monthly Review Press, 1974), page 113.

The operation of the electromagnetic separation and gaseous diffusion process of uranium at Oak Ridge was not unskilled labor. Operators were required to have fairly extensive training, and needed to follow a set of complicated procedures in order to process uranium to its maximum concentration. Operators were responsible for the complex starting procedures, as well as for adjustment of equipment for varying conditions. At the Y-12 electromagnetic separation plant, the work done by women had previously been done by graduate students at the University of California, Berkeley. However, the women who worked at Oak Ridge, by all accounts, ran the machines better, producing a purer product. As an Oak Ridge engineer recalled, "Nobody had ever operated one of those units except a Ph.D. in physics or an M.S. in engineering at Berkeley.... Those women operators, who were mostly high school graduates, some had never done anything before. ... But once they got over the shock, they could sit in front of that cubicle and be the most patient person in the world. With a really small amount of supervision, they really did the electromagnetic process."[2]

Training for using the machines was difficult, as the work and work environment was alienating and threatening. One trainer recalled, "We were told to get these operators used to the great noise and the sparking ... because it was frightening. [There was so strong a magnetic field] you couldn't wear bobby pins."[3] An engineer remembered, "I had seen girls break into tears, just walking into the building and seeing all those giant pumps and cranes and noise and everything."[4] These feelings of discomfort in the plant were not limited to women process workers. An engineer recalled, "We had mechanics ... who would not go into the magnetic field, because they'd feel it tugging at their keys in their pocket, and they were afraid."[5] The work environment at Oak Ridge was alienating to many workers, due to the vast scale of the operation, but also due to the strange conditions created by the electricity and magnetism that saturated the facility.

Within this work environment, managers went to great lengths to keep workers ignorant about their jobs. Women who ran the cubicles that electromagnetically separated U-235 from U-238 read gauges without labels to operate the machines. One trainer of workers at Y-12 recalled, "I didn't know what everything meant about a cubicle or a track at all. I wasn't supposed to ask any questions. All I was supposed to do is to get the proper readings on certain needles."[6] Workers were instructed to keep the needle at a certain point on the meter, but there were no numeric values on the equipment, giving no clue as to what was being processed. Connie Bolling, a Y-12 operator, recalled, "I didn't tell [people] anything [about my job]. I had them ask me 'What is this? What does this stand for.' I would not answer. I'd say, 'I don't know.' Because many did answer questions and say things or even get what it is, and they were gone the next day."[7] Thus, as uranium was

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[2]Robert Livingston, Interview by Stanley Goldberg, March 5, 1987, Smithsonian Videohistory Program, Manhattan Project, Session 6, page 68. Smithsonian Archive.

[3]Colleen Black, Interview by Stanley Goldberg, March 3, 1987, Smithsonian Videohistory Program, Manhattan Project, Session 5, page 32. Smithsonian Archive.

[4]Robert Livingston, Interview by Stanley Goldberg, March 5, 1987, Smithsonian Videohistory Program, Manhattan Project, Session 6, page 68. Smithsonian Archive.

[5]Chris Keim, Interview by Stanley Goldberg, March 5, 1987, Smithsonian Videohistory Program, Manhattan Project, Session 6, page 88. Smithsonian Archive.

[6]Connie Bolling, Interview by Stanley Goldberg, March 3, 1987, Smithsonian Videohistory Program, Manhattan Project, Session 5, page 20. Smithsonian Archive.

processed and reprocessed to greater and greater concentrations, operators did not know it, as the needle remained in the same location. One engineer remembered, "The electrical groups would go through there and they'd put shunts on the meters, so as far as the girls were concerned, the meters were always reading the same ratio.... As the quality increased, we would shunt one of the meters so they would always read the same thing for them."[8] As long as the women kept the needly between the two lines provided, they needed to know no more about the process going on within the machine.

Unlike the Y-12 electromagnetic separation plant the gaseous diffusion process in K-25 employed both men and women in uranium separation. This process involved taking gaseous Uranium Hexafluoride, a heavy and corrosive gas, and running it through a separation process within a system of sealed pipes. At K-25, much of the work focused on keeping the system running, and especially on stopping any leaks of air into the system.

One worker recalled her work as a constant search for problems. She remembered, "I worked in the conditioning plant at K-25, [We would look for a leak] and then we'd mark it, call the inspector, and she would come inspect the leak and see if it were really leaking. Then we'd call the millwright and he'd take the pipe away. And we did this all day long to make sure the pipes were tight, to go over to the big building. ... I didn't know what they were doing with these pipes."[9]

This work was often done in uncomfortable quarters, and lack of knowledge about the process made it unclear to workers whether it was dangerous or not. Y-12 worker Colleen Black remembered, "In another part of it, they called it the basement, they were doing converters. I don't know exactly what they were doing, but sometimes they would send me down there to find leaks, and you had to climb up real high... and you had to climb all over these pipes and find the leak. I didn't know what we were doing. I didn't ask. I know one time one of the GI's told me, 'If you ever smell anything, get out of here.' So I thought, something must be going through these pipes that smells bad."[10] Not only did UF_6 smell bad, it was a highly toxic substance.

Workers were not warned about possible uranium or fluorine poisoning at K-25, however, due to "security regulations." As one trainer recalled, "It was a challenge to train [K-25 operators] adequately, make them understand the importance of leaks in the plant, the importance of keeping things in a steady state and smooth operating, without really explaining what it was we were doing and why exactly some of these things needed to be done. Also, the safety problems. You know, these are hazardous gases, and so a lot of attention was paid to that, without people getting overly concerned about it."[11]

These regulations meant that many workers did not know about possible exposure to health hazards until after the war was over. One worker recalled:

> I got a call to bring some electricians to a secret warehouse on the East end of Oak Ridge, to put some fans in. The warehouses were getting so hot that they were afraid that they were going to blow up. They told me, "You can

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[7]Connie Bolling, Interview by Stanley Goldberg, March 3, 1987, Smithsonian Videohistory Program, Manhattan Project, Session 5, page 25. Smithsonian Archive.

[8]George Banic, Interview by Stanley Goldberg, March 5, 1987, Smithsonian Videohistory Program, Manhattan Project, Session 6, page 69. Smithsonian Archive.

[9]Colleen Black, Interview by Stanley Goldberg, March 3, 1987, Smithsonian Videohistory Program, Manhattan Project, Session 5, page 44-45. Smithsonian Archive.

[10]Colleen Black, Interview by Stanley Goldberg, March 3, 1987, Smithsonian Videohistory Program, Manhattan Project, Session 5, page 47. Smithsonian Archive.

[11]Paul Vanstrum, Interview by Stanley Goldberg, March 5, 1987, Smithsonian Videohistory Program, Manhattan Project, Session 7, page 24. Smithsonian Archive.

> take your men in there for 30 minutes, take them out for 40 minutes, then they can go back for another 30 minutes. I was curious about this, and when I went in, I saw all these sacks of what looked like fertilizer, about the width of a boxcar, five foot high and maybe 80 foot length. ... When the bomb was dropped, there was a picture in a newspaper of all these bags of uranium sitting on a dock in Canada. And that's when I realized what I had been looking at. And they didn't know at the time how much radiation you could get out of that.[12]

Workers, in both construction and production were routinely placed in situations in which exposure to radiation or other hazardous substances was possible. However, they were never given a choice to refuse a hazardous assignment, or told their exposure level. Instead, like the worker above, they learned about the hazards of their work only retroactively, after the end of the war, if at all.

The Compartmentalization of Work at Oak Ridge

Within the plants, the compartmentalized and secretive nature of work insured that workers did not know anything about the plant outside their own job. Workers at Y-12 were classified by number according to where they could go in the plant, and by how much they were allowed to know about their job. Those who were at level one were limited to maintenance work in the basement. The process workers were at level two, and were allowed on the main factory floor to work their "cubicle," though not to know what they were processing. Supervisors and engineers up to level three and four knew more about the process, but were not told the ultimate goals of the project. As one worker at Y-12 remembered, these work rules helped create a divided workforce. Workers were limited in their mobility according to badge number within the factory, "and the heater operators and the vacuum operators, they just had a 1 on their badge, and they couldn't come upstairs. The vacuum people in the basement and the heater people that operated the heaters, they couldn't come up on the top floor where the cubicles were. They had a guard at the stairs."[13]

At K-25, the other major production plant, the colors on the badge indicated a range of access. One woman remembered, "This is my husband's badge. It has three colors on it. Now he was allowed to go in ... where he worked in the conditioning building, and to the cafeteria and a color to the restroom. And we were not allowed to go anywhere else. ... We were just in our little compartments."[14] This structure for every part of work life, down to which bathroom one could use, was rigorously enforced within the factories. One worker recalled, "That was really how they kept that compartmentalization. That's what they called it, the way they kept it secret, because people really couldn't put things together."[15] Even the next highest badge level, which included engineers, scientists and managers, were also restricted by these regulations. As an engineer recalled, "They very carefully discouraged any conversations between projects, like between Chicago-Berkeley plutonium program

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[12] Jackson and Johnson, 5/15/76.

[13] Connie Bolling, Interview by Stanley Goldberg, March 3, 1987, Smithsonian Videohistory Program, Manhattan Project, Session 5, page 42. Smithsonian Archive.

[14] Colleen Black, Interview by Stanley Goldberg, March 3, 1987, Smithsonian Videohistory Program, Manhattan Project, Session 5, page 44. Smithsonian Archive.

[15] Jane Larson, Interview by Stanley Goldberg, March 3, 1987, Smithsonian Videohistory Program, Manhattan Project, Session 5, page 42. Smithsonian Archive.

and Y-12, and then between X-10 and Y-12, and also on the diffusion side. That compartmentalization worked remarkably well."[16]

This system of compartmentalization limited communications between workers, as well as scientists and engineers. It ensured that even when people did have an idea about what the goal of the Manhattan Project was, they could not piece together information about the different plants and facilities involved. This meant that only a few top officials knew all of the information, and that the vast majority of workers had little knowledge, and therefore power, to challenge management in the factories.

The Security System

The military security system at Oak Ridge was designed to keep workers from talking in public about their jobs or the purpose of the project. It relied on uniformed and undercover police, as well as a network of informers in the plants and in the community. This system kept workers from comparing information about their jobs, including working conditions, hours or wages.

Engineers and supervisors were a part of the elaborate deceptions of security. One engineer remembered, "You couldn't describe what the materials were. You couldn't say uranium hexafluoride like we do now- it was C616. ... So they would talk in code."[17] Since different project locations, such as Chicago and Berkeley, had different codes, it would be difficult for a scientist or engineer in one location to communicate with another. The head of a laboratory section recalled that security concerns pervaded the workplace and became self-enforcing. He said, "Being in the supervisory end of the business, a military man would come up and he would introduce himself. He would say that anything I would see that needed to be reported, I could give him the information and the source would never be told.... This was very common on the job and every once in a while a person would be terminated. A good worker, would come up in tears, but we would never know why.... It was so ingrained in us that even we would question a person that we thought shouldn't be there."[18] One foreman recalled that his wife worked as a guard at the Y-12 facility, and that "people [were] taken in for questioning and then disappeared," from Oak Ridge, as they were fired for security reasons and their housing taken away. He thought he had an intelligence officer in his crew, "a highly educated man who went around checking batteries" - who was assigned that task to send him throughout the facility to eavesdrop on workers' conversations.[19]

The security system affected workers both inside and outside the plants. Security personnel monitored meetings of more than three people on the streets, and undercover agents mingled at any social public occasions. Manhattan District documents show that there were at least 18 full-time undercover intelligence agents at Oak Ridge, and 178 full-time intelligence and security personnel. This did not even include the 866 military guards in the community and installations.[20] All movements were monitored. One worker recalled, "Everyone had to wear a badge. And even if you walked out on the streets and went to a

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[16]Clarence Larson, Interview by Stanley Goldberg, March 5, 1987, Smithsonian Videohistory Program, Manhattan Project, Session 6, page 76. Smithsonian Archive.

[17] Paul Vanstrum, Interview by Stanley Goldberg, March 5, 1987, Smithsonian Videohistory Program, Manhattan Project, Session 7, page 43. Smithsonian Archive.

[18]Jackson and Johnson, 7/24/76

[19]Jackson and Johnson, 7/24/76

[20]RG 77, MED E5, 319.1 Box 52. This document is an audit of MP security division and lists the numbers and ranks of security and intelligence personnel throughout the project.

movie, you should wear a badge. And you were stopped at the gates going into the city to make sure that you had your badge, or you could get a pass for someone."[21]

Even mundane activities were used to keep tabs on employees. At the Oak Ridge Post Office, the security system was part of routine mail delivery. One postal worker recalled that the workers at the office "recorded magazines received and the point of origin of letters, for FBI and military intelligence."[22] Another post office employee recalled that ordinary people in Oak Ridge sent reports to military intelligence by sending letters to "Acme Credit corporation with any reports."[23] At the post office, many such letters arrived daily for this bogus company.

Other employees confirm that the security system prevented any open communication between workers about job-related issues. One man recalled, "After a while, you got so used to the thing, and the security program was so successful, you just had no desire to talk about it [or its product]."[24] The implicit threats of the system, losing one's job, being evicted from Oak Ridge, and being drafted by the military, were effective in keeping workers isolated. As one employee remembered, one "didn't mind keeping quiet because the alternative was getting shipped overseas."[25]

Off-site events could have an adverse affect on workers as well. One worker said, "Someone [with my name] wrote a letter to *Daily Worker*. I was called in for questioning - I couldn't figure out why until afterward."[26] This security system served, during the war, to keep workers isolated, and after the war, continued to make employment at Oak Ridge isolated and insecure for workers.

Setting Standards for Worker Exposure to Radiation

Before World War II, scientists and physicians knew that radiation and radioactive substances were dangerous.[27] Knowledge of radiations dangers were based on several key cases of radiation overexposure. The first cases were the injuries caused to researchers in the late Nineteenth century by x-rays and radioactive substances. In the 1920s and 1930s, cases of radium poisoning occurred in New Jersey luminous dial factories, in which several woman dial painters died and others were permanently injured by radium poisoning.[28]

As a response to these problems with radiation, the National Committee on Radiation Protection (NCRP) was founded to set radiation exposure standards. However,

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[21] Colleen Black, Interview by Stanley Goldberg, March 3, 1987, Smithsonian Videohistory Program, Manhattan Project, Session 5, page 44. Smithsonian Archive.

[22]Jackson and Johnson, 7/17/76.

[23]Jackson and Johnson, 3/25/76.

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[25] Jackson and Johnson, 7/24/76.

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[27]See Barton Hacker, *The Dragon's Tail,* pages (Berkeley: University of Califronia Press, 1987), 10-33.

[28]Claudia Clark, "Radium Poisoning Revealed: A Case Study in the History of Industrial Health Reform," *Humboldt Journal of Social Relations*, Volume 16, Number 2 (1991).

the NCRP was comprised of scientists and physicians from universities, manufacturers and hospitals who sought to promote the use of radiation as a therapeutic, scientific or industrial tool; representatives of workers or patients were not invited to participate in any of its panels or decisions. As Gilbert Whittemore has shown in his dissertation on the NCRP, the committee sought to set a safe exposure level that would not slow the development and use of radiation in industry and medicine.

The NCRP set a "tolerance" standard for worker or patient radiation exposure that was not a "harmless" level of exposure, but an "acceptable" level of risk. As Gilbert Whittemore has shown in his study of the NCRP, the "tolerance dose" of radiation for workers was simply the dose that could be considered "tolerable" by the NCRP.[29] The officials of the NCRP knew that damage did in fact occur to workers below this level. Hermann Muller's 1927 article, "The Artificial Transformation of the Gene," showed that genes were damaged by radiation at low doses, and the NCRP accepted this damage as real, but unavoidable if use of radioactive materials and processes were to increase.[30]

The Manhattan Project's Radiation Protection Program

There is no evidence that the Manhattan Project's Medical and Health Physics personnel were ignorant about the harmful effects of radiation on living tissue. Radium and other radioactive substances were known to be dangerous before World War II.[31] The Manhattan Project's Medical Division gathered reports on radiation safety in order to set project exposure standards. Reports from the Medical Division demonstrate that officials knew from the scientific literature of the time that radium and other radioactive substances were harmful if ingested or inhaled. Wartime Medical Division animal research demonstrated that radioactive dust or gas in the air causes lung cancer, and that overexposure to radiation could cause tissue damage, and in high doses, death by radiation sickness.[32] These damaging aspects of radiation were investigated by the MED as the basis for a radiological weapons program.

By 1944, the Medical Division's wartime animal experimentation program showed that uranium could cause 'nephritis' of organs, and caused damage to the kidneys, the central nervous system, and changes in blood chemistry.[33] By 1945, animal experimentation revealed that exposure to radiation caused leukemia, lung, bone and ovarian cancer. Medical Division Associate Director Robert Stone wrote, "In cases of people with overexposure we will have to admit the possibility of a connection between the employment [with the Manhattan Project] and the disease, and accept the responsibility."[34] However, the Project never warned workers about these risks, primarily out of fear that

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[29]Gilbert Whittemore, "The National Committee on Radiation Protection, 1928-1960" Ph.D. Thesis, History of Science, Harvard University, 1986, page 88.

[30]Whittemore, "The National Committee on Radiation Protection," page 177, and Hacker, *The Dragon's Tail,* pages 26-7.

[31]See Hacker, *The Dragon's Tail,* pages 10-33.

[32]These findings were all documented in the papers of Harrison Martland, whose work was used as an early basis of Manhattan Project health and safety policy.

[33]"Special Hazard Survey," 44-7-603, 1944, EH00182, Public Reading Room, Oak Ridge Operations Office.

[34]Robert Stone to Members of Medical Division, 3/29/45. ES00199 Public Reading Room, Oak Ridge Operations Office.

project workers would not wish to be exposed to these substances, and that workers already exposed to these substances would sue the project. Instead, workers were reassured that their jobs exposed them to no real harm.

The Medical Division's findings about the dangers of radiation did not lead the Project to impose more rigorous safety practices. Quite the opposite occurred. As more was being learned about radiation damage from 1942 to 1945, the project's production schedule was accelerating; paradoxically, just as the dangers of radiation exposure were being understood, even minimal exposure standards were relaxed to meet the demands of production. Workers were exposed to higher levels of radiation than pre-war standards would permit, even though scientists were questioning whether these pre-war standards were sufficient.

Case Study: Building 706-C of the Clinton Laboratories

Every month, Clinton Laboratories, (X-10) processed tons of uranium slugs in order to create only grams of plutonium; this was a long, frustrating process that involved over 1400 employees.[35] The volume and rate of production limited safety considerations and effectively made it impossible to limit workers' exposure to contemporary radiation standards.

Worker safety was subordinated to production needs, due to lack of time, proper amounts of space, and enough personnel to rotate workers properly. Though Medical and Health Physics personnel brought the problem of worker overexposure to the attention of their superiors, and demanded changes in laboratory procedure, production considerations meant that improvement of safety conditions was put off indefinitely.

One of the safety problems at Building 706-C was that the laboratory used higher levels of radiation than it had been designed for. The X-10 Section Chief for Fission Products wrote in January 1945 that 706-C was "terribly overcrowded for work of high urgency, that work is being done in the building at a level ... in excess of design with respect to curies of hard gamma emitter and mass of uranium."[36] X-10 Chemistry Section Leader Waldo Cohn wrote, "706-C was designed for a maximum of 80 C at a point, and 10 C of hard gamma (it is a one slug building) and a maximum of 10 men. It is being used for 400 C of hard gamma production on a 2300 slug basis, and it is populated by over 20 men. Janitorial and laboratory assistance is not in proportion to need in spite of effort to procure it. The pressure to produce is antagonistic to the slowness and care with which we should prefer to operate on such super-hot material."[37] This lack of space and personnel meant that workers received overdoses of radiation.

Manhattan Project records reveal that overexposure to radiation, and near tolerance level exposure to radiation were not isolated incidents at 706-C. Instead, the Medical Section and Health Physics fought a constant losing battle to keep radiation levels at the Project's tolerance dose. In early November, 1944, Dr. John E. Wirth complained that the conditions in 706-C were leading to over-exposure of personnel. Wirth wrote, "It is necessary to bring certain information to your attention regarding slight over-exposure (based on a tolerance of 100mr/day) of personnel to radiation in the 706C building during the recent hot runs. Analysis shows ... 11 persons with readings greater than 100 mr/day

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[35] M.D. Whitaker to E. J. Murphy, September 2, 1994. 44-9-542 Production. ORF01762. Public Reading Room, Oak Ridge Operations Office.

[36] Coryell to Johnson, 1/13/45, ORFO1362 Public Reading Room, Oak Ridge Operations Office.

[37] Waldo E. Cohn to W.C. Johnson, 1/13/45. ORFO0559. Public Reading Room, Oak Ridge Operations Office.

upon one or more occasions." [38] Waldo Cohn explained that these exposures were caused by the speed and volume of production, "All 706-C operations, to this date, have been conducted under pressure. To do our job, and to get it done, means taking calculated risks."

The extent of radiation exposure in 706-C and in all of Clinton laboratory was undercounted due to failure to monitor workers with hand or personal dosimeters (radiation detectors) during routine operations. Health physics reports indicate that on several occasions, hand meters or film badges were not worn, or that readings were not recorded, due to the speed and pressure of the job.[39] A former worker at X-10 testified that in 1945, the radiation monitoring and safety system was ineffective:

> When I went to work there we had problems with the Geiger counter. We had one assigned to the department for each shift and half the time it wouldn't work. But we still had to carry on. It didn't change the shift procedure because we were on a production schedule. [At X-10] we didn't know what a tolerance [dose] was when I went to work there. Our dosimeters didn't work half the time, they changed different styles. We've even had dosimeters assigned to us that didn't have film in them.[40]

Within a workplace contaminated with radiation from a variety of sources, to allow workers to work without proper badges and safety equipment could not help but lead to an underestimation of worker radiation exposure.

Conclusion

The Taylorized structure of work at Oak Ridge meant that workers had little knowledge of what they were producing or of the dangers of the materials with which they worked. This critical lack of knowledge limited what questions workers could ask about safety. It would not be until after World War II that workers would organize and begin to question the structure of work at Oak Ridge. This is not to say that workers were completely acquiescent in Oak Ridge, as the next chapter on labor policy and worker resistance will show. However, since issues of radiation and chemical safety were handled entirely by management, workers could be kept in the dark about possible health effects. As Steven Lukes and John Gaventa have written, to keep questions from arising is the ultimate source of power, as the Army and the management of the plants at Oak Ridge knew.[41]

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[38] John Wirth to M.D. Whitaker, 11/7/44 ORFO2535 Public Reading Room, Oak Ridge Operations Office.

[39] Simons to Morgan, 7/26/45, ORFO2610 Public Reading Room, Oak Ridge Operations Office.

[40]Testimony of Floyd Grizzell, ACHRE Panel Meeting, Knoxville, TN, March 2, 1995.

[41] Steven Lukes, *Power: A Radical View.* (New York: Macmillan, 1974). John Gaventa, *Power and Powerlessness: Quiessence and Rebellion in an Appalachian Valley.* (Urbana: University of Illinois Press, 1980).

Chapter 5 Work Structure in the Plants at Oak Ridge: Work Experience and Radiation Safety at Oak Ridge During the Manhattan Project

Introduction

At first view, the atomic factories at Oak Ridge would seem to be Frederick W. Taylor's dream come true. In Oak Ridge's uranium processing and separation plants, work was divided into the smallest units possible, and these steps were brought together into an automated process. Workers only knew about their small part of the production process, and did not even know what the final product of their labor was. When Frederick W. Taylor wrote *Principles of Scientific Management* in 1911, he wrote that knowledge of the production process was management's monopoly, and that work should be divided into mental and physical components; the worker needed to know nothing about the job except his specific task and the manager would present these task in simplified diagrams. This management technique took away the "shop knowledge" that workers could use as leverage over their bosses, and reduced workers to efficient drones.[1]

Harry Braverman, in *Labor and Monopoly Capital*, wrote that Taylorism revolutionized industry, destroying the craft system of work, and "deskilling" the workplace. Scholars from sociology, history of technology, and labor studies have debated the "Braverman thesis" ever since, finding that some industries have indeed been deskilled by automation, while others, although highly automated, have remained dependent on skilled workers.

At Oak Ridge, the highly divided and compartmentalized system of labor had different effects than the Braverman thesis would have predicted. The uranium separation process, though highly automated, did not lead to a de-skilled workplace. Instead, as managers and scientists recognized, production workers at Oak Ridge were highly skilled in the tasks they did, more so than the scientists who worked on the equipment previously. However, the Army and the contractors, through division of labor and compartmentalization of information, were successful in keeping workers ignorant of the purpose of their job and the hazards of the materials and processes they worked with. The military security system at Oak Ridge insured that workers did not talk or organize around workplace issues. At Oak Ridge, the structure of work created a labor force that was both highly skilled and powerless to change their workplace.

The Taylorized work process at Oak Ridge and the compartmentalization and security system therefore had the effect of separating two aspects of "skill:" technical know-how and autonomy over work pace and conditions. The image of the nineteenth century skilled worker that David Montgomery has given us no longer applies in World War II Oak Ridge. Even the most skilled machinists at Oak Ridge, who had great craft skill in the traditional sense, had no knowledge of many of the substances they were called upon to machine. The component of skill that came from knowledge of the materials involved in production had been transferred from the skilled workers to the scientist and engineers, who did not let this information trickle down to the workers.

In this chapter, I examine the implications of the military's Taylorized work structure at Oak Ridge. In the first part of this chapter, I describe the work environment of the factories at Oak Ridge and the ways in which the work process was divided at Oak Ridge, but was not de-skilled. In the second part of the chapter, I discuss what was known about the dangers of radiation at the time of the Manhattan Project, and how the standards for radiation exposure were set. In the final part of the chapter, I present a case study of a single building at Oak Ridge, and the hazards that workers were exposed to as a result of wartime production pressures.

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[1] Harry Braverman, *Labor and Monopoly Capital*, (New York: Monthly Review Press, 1974), page 113.

Running the Factories

The operation of the electromagnetic separation and gaseous diffusion process of uranium at Oak Ridge was not unskilled labor. Operators were required to have fairly extensive training, and needed to follow a set of complicated procedures in order to process uranium to its maximum concentration. Operators were responsible for the complex starting procedures, as well as for adjustment of equipment for varying conditions. At the Y-12 electromagnetic separation plant, the work done by women had previously been done by graduate students at the University of California, Berkeley. However, the women who worked at Oak Ridge, by all accounts, ran the machines better, producing a purer product. As an Oak Ridge engineer recalled, "Nobody had ever operated one of those units except a Ph.D. in physics or an M.S. in engineering at Berkeley.... Those women operators, who were mostly high school graduates, some had never done anything before. ... But once they got over the shock, they could sit in front of that cubicle and be the most patient person in the world. With a really small amount of supervision, they really did the electromagnetic process."[2]

Training for using the machines was difficult, as the work and work environment was alienating and threatening. One trainer recalled, "We were told to get these operators used to the great noise and the sparking ... because it was frightening. [There was so strong a magnetic field] you couldn't wear bobby pins."[3] An engineer remembered, "I had seen girls break into tears, just walking into the building and seeing all those giant pumps and cranes and noise and everything."[4] These feelings of discomfort in the plant were not limited to women process workers. An engineer recalled, "We had mechanics ... who would not go into the magnetic field, because they'd feel it tugging at their keys in their pocket, and they were afraid."[5] The work environment at Oak Ridge was alienating to many workers, due to the vast scale of the operation, but also due to the strange conditions created by the electricity and magnetism that saturated the facility.

Within this work environment, managers went to great lengths to keep workers ignorant about their jobs. Women who ran the cubicles that electromagnetically separated U-235 from U-238 read gauges without labels to operate the machines. One trainer of workers at Y-12 recalled, "I didn't know what everything meant about a cubicle or a track at all. I wasn't supposed to ask any questions. All I was supposed to do is to get the proper readings on certain needles."[6] Workers were instructed to keep the needle at a certain point on the meter, but there were no numeric values on the equipment, giving no clue as to what was being processed. Connie Bolling, a Y-12 operator, recalled, "I didn't tell [people] anything [about my job]. I had them ask me 'What is this? What does this stand for.' I would not answer. I'd say, 'I don't know.' Because many did answer questions and say things or even get what it is, and they were gone the next day."[7] Thus, as uranium was

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[2]Robert Livingston, Interview by Stanley Goldberg, March 5, 1987, Smithsonian Videohistory Program, Manhattan Project, Session 6, page 68. Smithsonian Archive.

[3]Colleen Black, Interview by Stanley Goldberg, March 3, 1987, Smithsonian Videohistory Program, Manhattan Project, Session 5, page 32. Smithsonian Archive.

[4]Robert Livingston, Interview by Stanley Goldberg, March 5, 1987, Smithsonian Videohistory Program, Manhattan Project, Session 6, page 68. Smithsonian Archive.

[5]Chris Keim, Interview by Stanley Goldberg, March 5, 1987, Smithsonian Videohistory Program, Manhattan Project, Session 6, page 88. Smithsonian Archive.

[6]Connie Bolling, Interview by Stanley Goldberg, March 3, 1987, Smithsonian Videohistory Program, Manhattan Project, Session 5, page 20. Smithsonian Archive.

processed and reprocessed to greater and greater concentrations, operators did not know it, as the needle remained in the same location. One engineer remembered, "The electrical groups would go through there and they'd put shunts on the meters, so as far as the girls were concerned, the meters were always reading the same ratio.... As the quality increased, we would shunt one of the meters so they would always read the same thing for them."[8] As long as the women kept the needly between the two lines provided, they needed to know no more about the process going on within the machine.

Unlike the Y-12 electromagnetic separation plant the gaseous diffusion process in K-25 employed both men and women in uranium separation. This process involved taking gaseous Uranium Hexafluoride, a heavy and corrosive gas, and running it through a separation process within a system of sealed pipes. At K-25, much of the work focused on keeping the system running, and especially on stopping any leaks of air into the system.

One worker recalled her work as a constant search for problems. She remembered, "I worked in the conditioning plant at K-25, [We would look for a leak] and then we'd mark it, call the inspector, and she would come inspect the leak and see if it were really leaking. Then we'd call the millwright and he'd take the pipe away. And we did this all day long to make sure the pipes were tight, to go over to the big building. ... I didn't know what they were doing with these pipes."[9]

This work was often done in uncomfortable quarters, and lack of knowledge about the process made it unclear to workers whether it was dangerous or not. Y-12 worker Colleen Black remembered, "In another part of it, they called it the basement, they were doing converters. I don't know exactly what they were doing, but sometimes they would send me down there to find leaks, and you had to climb up real high... and you had to climb all over these pipes and find the leak. I didn't know what we were doing. I didn't ask. I know one time one of the GI's told me, 'If you ever smell anything, get out of here.' So I thought, something must be going through these pipes that smells bad."[10] Not only did UF_6 smell bad, it was a highly toxic substance.

Workers were not warned about possible uranium or fluorine poisoning at K-25, however, due to "security regulations." As one trainer recalled, "It was a challenge to train [K-25 operators] adequately, make them understand the importance of leaks in the plant, the importance of keeping things in a steady state and smooth operating, without really explaining what it was we were doing and why exactly some of these things needed to be done. Also, the safety problems. You know, these are hazardous gases, and so a lot of attention was paid to that, without people getting overly concerned about it."[11]

These regulations meant that many workers did not know about possible exposure to health hazards until after the war was over. One worker recalled:

> I got a call to bring some electricians to a secret warehouse on the East end of Oak Ridge, to put some fans in. The warehouses were getting so hot that they were afraid that they were going to blow up. They told me, "You can

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[7]Connie Bolling, Interview by Stanley Goldberg, March 3, 1987, Smithsonian Videohistory Program, Manhattan Project, Session 5, page 25. Smithsonian Archive.

[8]George Banic, Interview by Stanley Goldberg, March 5, 1987, Smithsonian Videohistory Program, Manhattan Project, Session 6, page 69. Smithsonian Archive.

[9]Colleen Black, Interview by Stanley Goldberg, March 3, 1987, Smithsonian Videohistory Program, Manhattan Project, Session 5, page 44-45. Smithsonian Archive.

[10]Colleen Black, Interview by Stanley Goldberg, March 3, 1987, Smithsonian Videohistory Program, Manhattan Project, Session 5, page 47. Smithsonian Archive.

[11]Paul Vanstrum, Interview by Stanley Goldberg, March 5, 1987, Smithsonian Videohistory Program, Manhattan Project, Session 7, page 24. Smithsonian Archive.

> take your men in there for 30 minutes, take them out for 40 minutes, then they can go back for another 30 minutes. I was curious about this, and when I went in, I saw all these sacks of what looked like fertilizer, about the width of a boxcar, five foot high and maybe 80 foot length. ... When the bomb was dropped, there was a picture in a newspaper of all these bags of uranium sitting on a dock in Canada. And that's when I realized what I had been looking at. And they didn't know at the time how much radiation you could get out of that.[12]

Workers, in both construction and production were routinely placed in situations in which exposure to radiation or other hazardous substances was possible. However, they were never given a choice to refuse a hazardous assignment, or told their exposure level. Instead, like the worker above, they learned about the hazards of their work only retroactively, after the end of the war, if at all.

The Compartmentalization of Work at Oak Ridge

Within the plants, the compartmentalized and secretive nature of work insured that workers did not know anything about the plant outside their own job. Workers at Y-12 were classified by number according to where they could go in the plant, and by how much they were allowed to know about their job. Those who were at level one were limited to maintenance work in the basement. The process workers were at level two, and were allowed on the main factory floor to work their "cubicle," though not to know what they were processing. Supervisors and engineers up to level three and four knew more about the process, but were not told the ultimate goals of the project. As one worker at Y-12 remembered, these work rules helped create a divided workforce. Workers were limited in their mobility according to badge number within the factory, "and the heater operators and the vacuum operators, they just had a 1 on their badge, and they couldn't come upstairs. The vacuum people in the basement and the heater people that operated the heaters, they couldn't come up on the top floor where the cubicles were. They had a guard at the stairs."[13]

At K-25, the other major production plant, the colors on the badge indicated a range of access. One woman remembered, "This is my husband's badge. It has three colors on it. Now he was allowed to go in ... where he worked in the conditioning building, and to the cafeteria and a color to the restroom. And we were not allowed to go anywhere else. ... We were just in our little compartments."[14] This structure for every part of work life, down to which bathroom one could use, was rigorously enforced within the factories. One worker recalled, "That was really how they kept that compartmentalization. That's what they called it, the way they kept it secret, because people really couldn't put things together."[15] Even the next highest badge level, which included engineers, scientists and managers, were also restricted by these regulations. As an engineer recalled, "They very carefully discouraged any conversations between projects, like between Chicago-Berkeley plutonium program

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[12] Jackson and Johnson, 5/15/76.

[13] Connie Bolling, Interview by Stanley Goldberg, March 3, 1987, Smithsonian Videohistory Program, Manhattan Project, Session 5, page 42. Smithsonian Archive.

[14] Colleen Black, Interview by Stanley Goldberg, March 3, 1987, Smithsonian Videohistory Program, Manhattan Project, Session 5, page 44. Smithsonian Archive.

[15] Jane Larson, Interview by Stanley Goldberg, March 3, 1987, Smithsonian Videohistory Program, Manhattan Project, Session 5, page 42. Smithsonian Archive.

and Y-12, and then between X-10 and Y-12, and also on the diffusion side. That compartmentalization worked remarkably well."[16]

This system of compartmentalization limited communications between workers, as well as scientists and engineers. It ensured that even when people did have an idea about what the goal of the Manhattan Project was, they could not piece together information about the different plants and facilities involved. This meant that only a few top officials knew all of the information, and that the vast majority of workers had little knowledge, and therefore power, to challenge management in the factories.

The Security System

The military security system at Oak Ridge was designed to keep workers from talking in public about their jobs or the purpose of the project. It relied on uniformed and undercover police, as well as a network of informers in the plants and in the community. This system kept workers from comparing information about their jobs, including working conditions, hours or wages.

Engineers and supervisors were a part of the elaborate deceptions of security. One engineer remembered, "You couldn't describe what the materials were. You couldn't say uranium hexafluoride like we do now- it was C616. ... So they would talk in code."[17] Since different project locations, such as Chicago and Berkeley, had different codes, it would be difficult for a scientist or engineer in one location to communicate with another. The head of a laboratory section recalled that security concerns pervaded the workplace and became self-enforcing. He said, "Being in the supervisory end of the business, a military man would come up and he would introduce himself. He would say that anything I would see that needed to be reported, I could give him the information and the source would never be told.... This was very common on the job and every once in a while a person would be terminated. A good worker, would come up in tears, but we would never know why.... It was so ingrained in us that even we would question a person that we thought shouldn't be there."[18] One foreman recalled that his wife worked as a guard at the Y-12 facility, and that "people [were] taken in for questioning and then disappeared," from Oak Ridge, as they were fired for security reasons and their housing taken away. He thought he had an intelligence officer in his crew, "a highly educated man who went around checking batteries" - who was assigned that task to send him throughout the facility to eavesdrop on workers' conversations.[19]

The security system affected workers both inside and outside the plants. Security personnel monitored meetings of more than three people on the streets, and undercover agents mingled at any social public occasions. Manhattan District documents show that there were at least 18 full-time undercover intelligence agents at Oak Ridge, and 178 full-time intelligence and security personnel. This did not even include the 866 military guards in the community and installations.[20] All movements were monitored. One worker recalled, "Everyone had to wear a badge. And even if you walked out on the streets and went to a

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[16]Clarence Larson, Interview by Stanley Goldberg, March 5, 1987, Smithsonian Videohistory Program, Manhattan Project, Session 6, page 76. Smithsonian Archive.

[17] Paul Vanstrum, Interview by Stanley Goldberg, March 5, 1987, Smithsonian Videohistory Program, Manhattan Project, Session 7, page 43. Smithsonian Archive.

[18]Jackson and Johnson, 7/24/76

[19]Jackson and Johnson, 7/24/76

[20]RG 77, MED E5, 319.1 Box 52. This document is an audit of MP security division and lists the numbers and ranks of security and intelligence personnel throughout the project.

movie, you should wear a badge. And you were stopped at the gates going into the city to make sure that you had your badge, or you could get a pass for someone."[21]

Even mundane activities were used to keep tabs on employees. At the Oak Ridge Post Office, the security system was part of routine mail delivery. One postal worker recalled that the workers at the office "recorded magazines received and the point of origin of letters, for FBI and military intelligence."[22] Another post office employee recalled that ordinary people in Oak Ridge sent reports to military intelligence by sending letters to "Acme Credit corporation with any reports."[23] At the post office, many such letters arrived daily for this bogus company.

Other employees confirm that the security system prevented any open communication between workers about job-related issues. One man recalled, "After a while, you got so used to the thing, and the security program was so successful, you just had no desire to talk about it [or its product]."[24] The implicit threats of the system, losing one's job, being evicted from Oak Ridge, and being drafted by the military, were effective in keeping workers isolated. As one employee remembered, one "didn't mind keeping quiet because the alternative was getting shipped overseas."[25]

Off-site events could have an adverse affect on workers as well. One worker said, "Someone [with my name] wrote a letter to *Daily Worker*. I was called in for questioning - I couldn't figure out why until afterward."[26] This security system served, during the war, to keep workers isolated, and after the war, continued to make employment at Oak Ridge isolated and insecure for workers.

Setting Standards for Worker Exposure to Radiation

Before World War II, scientists and physicians knew that radiation and radioactive substances were dangerous.[27] Knowledge of radiations dangers were based on several key cases of radiation overexposure. The first cases were the injuries caused to researchers in the late Nineteenth century by x-rays and radioactive substances. In the 1920s and 1930s, cases of radium poisoning occurred in New Jersey luminous dial factories, in which several woman dial painters died and others were permanently injured by radium poisoning.[28]

As a response to these problems with radiation, the National Committee on Radiation Protection (NCRP) was founded to set radiation exposure standards. However,

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[34]Robert Stone to Members of Medical Division, 3/29/45. ES00199 Public Reading Room, Oak Ridge Operations Office.

project workers would not wish to be exposed to these substances, and that workers already exposed to these substances would sue the project. Instead, workers were reassured that their jobs exposed them to no real harm.

The Medical Division's findings about the dangers of radiation did not lead the Project to impose more rigorous safety practices. Quite the opposite occurred. As more was being learned about radiation damage from 1942 to 1945, the project's production schedule was accelerating; paradoxically, just as the dangers of radiation exposure were being understood, even minimal exposure standards were relaxed to meet the demands of production. Workers were exposed to higher levels of radiation than pre-war standards would permit, even though scientists were questioning whether these pre-war standards were sufficient.

Case Study: Building 706-C of the Clinton Laboratories

Every month, Clinton Laboratories, (X-10) processed tons of uranium slugs in order to create only grams of plutonium; this was a long, frustrating process that involved over 1400 employees.[35] The volume and rate of production limited safety considerations and effectively made it impossible to limit workers' exposure to contemporary radiation standards.

Worker safety was subordinated to production needs, due to lack of time, proper amounts of space, and enough personnel to rotate workers properly. Though Medical and Health Physics personnel brought the problem of worker overexposure to the attention of their superiors, and demanded changes in laboratory procedure, production considerations meant that improvement of safety conditions was put off indefinitely.

One of the safety problems at Building 706-C was that the laboratory used higher levels of radiation than it had been designed for. The X-10 Section Chief for Fission Products wrote in January 1945 that 706-C was "terribly overcrowded for work of high urgency, that work is being done in the building at a level ... in excess of design with respect to curies of hard gamma emitter and mass of uranium."[36] X-10 Chemistry Section Leader Waldo Cohn wrote, "706-C was designed for a maximum of 80 C at a point, and 10 C of hard gamma (it is a one slug building) and a maximum of 10 men. It is being used for 400 C of hard gamma production on a 2300 slug basis, and it is populated by over 20 men. Janitorial and laboratory assistance is not in proportion to need in spite of effort to procure it. The pressure to produce is antagonistic to the slowness and care with which we should prefer to operate on such super-hot material."[37] This lack of space and personnel meant that workers received overdoses of radiation.

Manhattan Project records reveal that overexposure to radiation, and near tolerance level exposure to radiation were not isolated incidents at 706-C. Instead, the Medical Section and Health Physics fought a constant losing battle to keep radiation levels at the Project's tolerance dose. In early November, 1944, Dr. John E. Wirth complained that the conditions in 706-C were leading to over-exposure of personnel. Wirth wrote, "It is necessary to bring certain information to your attention regarding slight over-exposure (based on a tolerance of 100mr/day) of personnel to radiation in the 706C building during the recent hot runs. Analysis shows ... 11 persons with readings greater than 100 mr/day

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[35] M.D. Whitaker to E. J. Murphy. September 2, 1994. 44-9-542 Production. ORF01762. Public Reading Room, Oak Ridge Operations Office.

[36] Coryell to Johnson, 1/13/45, ORFO1362 Public Reading Room, Oak Ridge Operations Office.

[37] Waldo E. Cohn to W.C. Johnson, 1/13/45. ORFO0559. Public Reading Room, Oak Ridge Operations Office.

upon one or more occasions." [38] Waldo Cohn explained that these exposures were caused by the speed and volume of production, "All 706-C operations, to this date, have been conducted under pressure. To do our job, and to get it done, means taking calculated risks."

The extent of radiation exposure in 706-C and in all of Clinton laboratory was undercounted due to failure to monitor workers with hand or personal dosimeters (radiation detectors) during routine operations. Health physics reports indicate that on several occasions, hand meters or film badges were not worn, or that readings were not recorded, due to the speed and pressure of the job.[39] A former worker at X-10 testified that in 1945, the radiation monitoring and safety system was ineffective:

> When I went to work there we had problems with the Geiger counter. We had one assigned to the department for each shift and half the time it wouldn't work. But we still had to carry on. It didn't change the shift procedure because we were on a production schedule. [At X-10] we didn't know what a tolerance [dose] was when I went to work there. Our dosimeters didn't work half the time, they changed different styles. We've even had dosimeters assigned to us that didn't have film in them.[40]

Within a workplace contaminated with radiation from a variety of sources, to allow workers to work without proper badges and safety equipment could not help but lead to an underestimation of worker radiation exposure.

Conclusion

The Taylorized structure of work at Oak Ridge meant that workers had little knowledge of what they were producing or of the dangers of the materials with which they worked. This critical lack of knowledge limited what questions workers could ask about safety. It would not be until after World War II that workers would organize and begin to question the structure of work at Oak Ridge. This is not to say that workers were completely acquiescent in Oak Ridge, as the next chapter on labor policy and worker resistance will show. However, since issues of radiation and chemical safety were handled entirely by management, workers could be kept in the dark about possible health effects. As Steven Lukes and John Gaventa have written, to keep questions from arising is the ultimate source of power, as the Army and the management of the plants at Oak Ridge knew.[41]

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[38] John Wirth to M.D. Whitaker, 11/7/44 ORFO2535 Public Reading Room, Oak Ridge Operations Office.

[39] Simons to Morgan, 7/26/45, ORFO2610 Public Reading Room, Oak Ridge Operations Office.

[40]Testimony of Floyd Grizzell, ACHRE Panel Meeting, Knoxville, TN, March 2, 1995.

[41] Steven Lukes, *Power: A Radical View.* (New York: Macmillan, 1974). John Gaventa, *Power and Powerlessness: Quiessence and Rebellion in an Appalachian Valley.* (Urbana: University of Illinois Press, 1980).

When the prohibition on union organizing at Oak Ridge was lifted in the Spring of 1946, the struggle to build a labor movement became intertwined with the struggle for constitutional and democratic rights in the community. Through labor organizing, the CIO and the AFL helped to force the military to "open" Oak Ridge, founding Oak Ridge's first non-military newspapers, demanding the rights to hold meetings and distribute literature, and asserting that workers at Oak Ridge were citizens as well as workers. This struggle for both sets of rights, community and labor, made Oak Ridge a successful part of the southern organizing drives of the AFL and C.I.O., which largely failed to organize the South's growing industrial workforce.

"Operation Dixie" comes to Oak Ridge

Historian Barbara Griffith termed Operation Dixie, the CIO drive to organize the American South, "the crisis of the American labor movement." In one sweep, the CIO and AFL sought to organize the American South, the region with the fewest union members and the lowest wages. The CIO dispatched hundreds of paid organizers to the region to spread the gospel of trade unionism at textile mills, chemical factories and other industrial sites. The opening battle in this drive was the struggle to organize the Atomic Energy Commission's atomic weapons facilities at Oak Ridge, Tennessee. By the end of the war, Oak Ridge employed 33,000 men and women, and was the sixth-largest city in the state of Tennessee. Nestled in the American South, a region of small industrial and textile plants located in hostile rural communities, Oak Ridge was an industrial city, much like those organized by unions in the Northeast and Midwest in the 1930s.

However, the Southern drive was not as successful in the South as the CIO had expected. Though Operation Dixie (and the A.F. of L. Southern organizing drive of the same period) brought thousands of workers into unions, and exposed many more to the promise of unionism, historians have judged the southern drive an overwhelming failure. The CIO quietly terminated the drive in the 1953, due to the cost and lack of benefit for the unions involved. The south remains, to this day, a bastion of "right-to-work" laws and ununionized labor.

Barbara Griffith, in *The Crisis of the American Labor Movement,* argues that both institutional and leadership failings doomed the drive. Though many organizers were prepared to organize in the hostile communities of the South, they often concluded in the face of resistance that Southerners did not want unions, and gave up after initial defeats. Most importantly, Operation Dixie lacked a "galvanizing" victory that would have broken through the paternalism and repression of Southern industrial life.[1]

Robert Zieger contends in *The CIO, 1935-55,* that institutionally, Operation Dixie simply did not have the institutional support of the CIO unions that it needed to succeed. Lack of financial support hampered the drive, but a lack of spirit suffused the enterprise. Zieger notes, "CIO leaders believed that the time for laborite revival had passed. With a solid footing in the Democratic party, with labor law at last seemingly endorsing collective bargaining, and with a proud record of wartime patriotism, the CIO was not going to revert to the street tactics of the 1930s."[2] In 1946, though strikes

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[1]Barbara S. Griffith, *The Crisis of American Labor: Operation Dixie and the Defeat of the CIO,* (Philadelphia: Temple University Press, 1988), page 170.

[2]Robert Zieger, *The CIO: 1935-1955.* (Chapel Hill: University of North Carolina Press, 1995), page 241.

in automobiles, coal, electrical manufacturing, and steel swept the nation, these were marked by far less violence than the strikes of the 1930s.

Historian Michael Honey argues that Operation Dixie was hampered by the CIO failure to support the advancement of Civil Rights for African-Americans in the South. He acknowledges that employer "red-baiting, stool pigeons, vigilantes and race hatred" were imposing obstacles to the success of the drive, but adds, "Had the CIO used a different approach, one which helped advance the cause of black civil rights as well as unionization, it might have produced a significantly different result. At the very least, it would have left a more inspiring memory."[3]

These historical perspectives, one primarily institutional in focus, the other centered on issues of race, go a long way toward explaining the CIO's failure in the South, as well as the persistance of the anti-union climate in the region to the present. However, their bleak findings that Operation Dixie was, as Barbara Griffith terms it, "a moment of high tragedy from which [the labor movement] has yet to recover," misses the successes of the drive.[4] Oak Ridge represents a deviant case of successful labor organizing in a southern community. Unions at Oak Ridge not only organized the atomic factories, but also democratized the community. This deviant case, I argue, sheds light on why Operation Dixie failed elsewhere in the South.

Labor organizers used neighborhood issues and grievances, as well as workplace concerns, to win the support of the workers and the broader community. The unions successfully tied together the lack of constitutional and political rights at Oak Ridge with the lack of economic rights in the factories. Also, union organizing took place at the historic juncture at which Oak Ridge changed from a wartime boom town to an established community. Finally, the mixed racial and gender compositions of the plants made it impossible for the AF of L or CIO to win an NLRB election without campaigning for the votes of blacks or women, forcing both unions away from racially exclusionary unionism.

Conditions that Made Unions Attractive at Oak Ridge

Workers at Oak Ridge had endured a number of indignities during the war and shortly thereafter that caused them to organize after the war. These were problems with hiring and firing policies of the companies, lack of a fair grievance system, rising food and living prices, and the powerlessness of living under military and company rule.

The first source of insecurity at Oak Ridge was the lack of seniority protection for workers. During 1946, Carbon & Carbide Chemical Corporation and Tennessee Eastman laid off men and women as part of a "reduction in force," then hired workers to take the jobs of those fired. The CIO's new local newspaper, *The Atomic Worker*, reported, "While dozens of Tennessee Eastman workers are getting notices of termination daily, dozens more new, lower paid workers are being hired every day in the company's Knoxville and Oak Ridge offices." The CIO sent an organizer to look for a job at TEC, and was not only offered a job, but told to bring along any relatives in need of work.[5] By August 1946, 59,000 workers had been laid off in Oak Ridge, and 20,000 hired, making the CIO's case seem plausible to many in the community. The layoffs and lack of seniority protection meant that workers who were thinking of

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[3]Michael Honey, "Operation Dixie," *Labor History*, Volume 31, Number 3 (Spring 1990) 373-8, quotes at 374 and 378.

[4] Griffith, *Operation Dixie*, page 176.

[5]*The Atomic Worker*, July 24, 1946. Found in RG 326, Industrial Relations Collection, at Federal Records Center, East Pointe, Ga. [Hereinafter, AW]

staying indefinitely in Oak Ridge were more likely to look to unions to protect their jobs. At the same time, layoffs and quitting at the factories siphoned off many of the more temporary-minded workers who would have been less inclined towards unionism.

Wage rate differentials between workers also made unions attractive. As the CIO told workers, "Men working side by side on the same machines were not getting the same pay. In one building, some workers earned 72 cents an hour and other workers doing comparable work were earning $1.02."[6] The CIO used the slogan "equal pay for equal work" to oppose this company policy, as well as to support woman workers in their quest for equal wages.

Another source of worker insecurity was the lack of a fair grievance system. At Carbide, an employee fired for alleged incompetence went through the company-sponsored grievance system, but found that he could not have a representative, or his own stenographer, as part of the proceedings. As a last step, the company would choose and appoint an arbitrator to hear the case, but no union or worker input was allowed in the process.[7]

Rising costs also fueled union organizing. The companies that ran the plants at Oak Ridge paid more than coal mines or other industrial facilities in the area. However, inflation during and after wartime was rapidly eating into the prosperity Oak Ridgers were enjoying. With the demise of Office of Price Administration restrictions in 1945, food prices in Oak Ridge shot up. Butter prices rose from 54 cents per pound to 95 cents per pound. Beef prices increased from 52 cents per pound to 72 cents. Lard rose from 25 cents to 85 cents per pound, and pork from 40 cents to 68 cents per pound.[8] This rise in prices was estimated to mean a 30 percent wage cut for workers, and was a potent issue for both the AF of L and CIO.

Finally, the military's autocratic rule of Oak Ridge propelled many workers into unions. The lack of a free press at Oak Ridge meant that even the news of the atomic bomb explosion had to be read about in the *Knoxville Sentinel,* rather than the military-run *Oak Ridge Journal.* Civic organizations still needed permission to hold meetings at Oak Ridge. Distribution of unofficial literature was forbidden. The local churches needed military permission to hold vestry meetings, as these involved more than three people. These denials of basic freedoms were accepted in wartime conditions, but with the end of the war, workers had expected their rights back. Unions offered workers a collective voice to demand these rights, and to press the military for concessions.

The CIO Targets Oak Ridge

The CIO needed a victory at Oak Ridge. With few CIO resources or contacts in the area as of 1945, the union faced long odds in organizing 10,000 workers in a matter of months, and faced competition from an AF of L that had been present in Oak Ridge since 1943. The CIO United Gas Coke and Chemical Workers Union [UGCCWU] created the Atomic Workers Organizing Committee [AWOC] to run its Oak Ridge Drive. UGCCWU was not one of the CIO's biggest unions, with only 15,000 members at the time, and it relied on the CIO for financial help to remain alive.

Headed by C. W. Danenburg, the UGCCW campaign known as the Atomic Workers Organizing Committee [AWOC] sought to organize all "50,000 Atomic

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[6]*AW*, May 29, 1946.

[7]*AW*, June 26, 1946.

[8]*AW*, July 17, 1946.

workers into one big effective union."[9] However, AWOC was slow getting started. In early May 1946, Paul Christopher, Tennessee CIO Director, and Danenburg telegraphed to Van Bittner, the head of Operation Dixie, "Oak Ridge campaign stymied because of lack of publicity man... Please advise when we can expect publicity man with authority to proceed. Immediate action vitally important."[10] Organizationally, the Oak Ridge effort was slow in getting off the ground.

The initial drive was also blocked by restrictive security regulations. The MED set the ground rules for organizing. The policy, set by Curtis Nelson of the District Engineer's office, was as follows:

> a. literature may be distributed on the general area side of any plant gate to outgoing personnel by one union in any one 24 hour period. The literature will have the prior approval of this office.
>
> b....The Labor Branch will schedule the organization to distribute literature.
>
> c. Former members of the armed forces will not be permitted to engage in union organizational activities at this installation while wearing any part of their service uniform.
>
> d. If the distribution of literature at plant gates causes any security violation, breach of the peace, confusion resulting in a safety or traffic hazard, this policy will be rescinded or modified to one of a more restrictive nature.[11]

This policy was so strict as to make almost all literature distribution illegal, and was interpreted to the letter by military authorities. When a union organizer with two boys, ages 11 and 13, were leafletting at Carbon and Carbide, a military policeman asked them to step back from the gate, and asked for the children's names and addresses. The names were then sent on to the company and to the chief of police.

Under these rules, distributing literature was virtually a criminal offence. At Carbon and Carbide, union organizers for both the AFL and CIO were caught evading distribution rules. An AFL organizer was spotted "within the parking lot of the restricted area... [He] took from his personal car a wrapped bundle of literature, unwrapped some, and distributed some among the automobiles parked nearby and also distributed some to employees nearby... in violation of the established procedure in this matter."[12] A worker who supported the CIO was seen "carrying with him a bundle,... went through the post [into the plant area] and proceeded to distribute the literature which he had brought to work... The guard not being sure of his position made no comment and failed to secure the badge number of the employee."[13] Though workers had the right under the Wagner Act to

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[9]Atomic Workers Organizing Committee Press Release, May 24, 1946. Found in Littauer Library vertical collection, Harvard University. [Hereinafter, *AWOC*].

[10]Christopher to Bittner, May 11, 1946. Tennessee Series. Folder: "United Gas, Coke and Chemical Workers," Operation Dixie Collection, Duke University. [Hereinafter, *OD*.]

[11]United States Army, Manhattan Engineer District. Letter: Nelson to International Association of Machinists, 23 May 1946. Box 74, IAM folder. RG 326, National Archives Regional Branch- East Pointe, Ga.

[12]United States Army, Manhattan Engineer District. Letter: Fraser to Crawford, 28 June 1946. Box 74, Decimal File Man 080, Folder "CEW- Unions." RG 326, National Archives Regional Branch- East Pointe, Ga.

talk union and distribute literature and buttons on their breaks, this was ruled illegal by military authorities.

Scientists also complained of restrictions on their activities at Oak Ridge. The president of the Federation of Architects, Engineers, Chemists, and Technicians told the CIO Executive Council in November 1945 that scientists from Oak Ridge had told him "a rather gruesome story of intimidation and suppresion of thinking" at the site. Those scientists who had spoken out in favor of international and civilian control of atomic energy had been "hounded and harrassed and that they live in constant fear of retaliation."[14]

Under these conditions, the task of organizing these plants was almost impossible. Paul Christopher wrote in May 1946 that "the task requires, of course, a legion of volunteer organizers within the plants (425 different plants). We have about 50 who are presently doing this Jimmy Higgins work; later we will have many more." Christopher had high hopes— he ordered 5,000 AWOC membership buttons in May 1946, and told the vendor that he hoped to order another 25,000 soon.[15]

However, in May 1946, not very much organizing was getting done by the CIO. For the week of May 18, the AWOC had collected only 184 signed union cards; of these, 100 paid $1 in dues, while 74 were veterans, who paid no dues. Of the eleven organizers listed as being with CIO at the time, only 5 recruited more than 10 members, several others bringing in fewer than five new members. At this pace, 10,000 workers at Oak Ridge were not going to be organized anytime soon.[16]

The CIO Campaigns for Votes

From the beginning, AWOC stressed that young workers belonged in the CIO. AWOC claimed that workers at Oak Ridge were "in the world's newest and most important industry; an industry that ended the most tragic war in the history of mankind, an industry that will continue to make history and even shape world affairs in the future."[17] This sense of youth and energy is portrayed in a CIO cartoon of the A.F.L. represented as a farmer in a horse-drawn carriage, tailgated by the CIO motor bus eager to drive off into the future.[18] Newness was a major CIO selling point. Workers would want to "assist in making AWOC the most up to date union in the world." The CIO also appealed to members' youth, telling workers, "You will want to tell your friends that you belong to a Young Industry, a Young Union with dynamic Young people as members; a union that does not have old fogies sitting in swivel chairs acting as dictators."[19] This attempt to differentiate AWOC from the AFL was a recurrent theme in CIO literature of the drive, which directed more criticism at the AFL than on the military or the companies at Oak Ridge.

Workers at Oak Ridge, often the head of young families, needed economic security as much as any workers in the economy. The CIO told these workers that only

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[13]Fraser to Crawford, 28 June 1946, CEW CORR Box 74 Man 080 CEW- Unions RG 326

[14]CIO Executive Board Minutes, Nov 1,2, 1945, pages 271-2. CIO Executive Board Minutes Collection. Walter Reuther Library and Archive. Wayne State University.

[15]Christopher to Huberman, May 15, 1946. *OD*.

[16]Christopher to Huberman, May 15, 1946. *OD*.

[17]*AWOC*, May 27, 1946.

[18]*AWOC*, "Ten Years of C.I.O., 1935-45."

[19]*AWOC*, May 27, 1946.

a union contract, and not company paternalism, could protect their jobs. In June 1946, AWOC told workers that its goals were "1. Wage increases 2. Proper Job classifications. 3. A seniority clause." AWOC explained, "As you can see, a strong seniority clause will do away with favoritism and unjust termination and also give the person who merits promotion a chance for a better paying job."[20] AWOC also promised better grievance machinery, including "an experienced union representative to help and advise you and carry your case to arbitration if necessary."

Since workers fired from the plants were evicted from their Oak Ridge home almost immediately, the threat of being unjustly fired was a real one. The CIO set up a grievance committee to help workers in this regard, and asked the local courts to void eviction orders of those who claimed that they were fired due to unfair labor practices.[21]

AWOC let women know that it stood for higher wages and "equal pay for equal work."[22] This organizing campaign attempted to win women's votes at Oak Ridge. In a pamphlet, "The Woman and Her Job" the CIO pointed out that women's wages were 25 percent below men's wages at one Oak Ridge plant. The CIO asked, "Is the woman worker an economic old shoe, to be used only in the war emergency or at the lowest wage rate, and to be cast aside at the whim of the employer?"

The CIO promised women workers that "it is the CIO's policy and practice to establish equal pay for equal work, with no discrimination as to sex." It also promised women "participation in industrial democracy in a CIO union" where "women and men stand shoulder to shoulder in the common cause." It concluded, "In the CIO women workers are finding the way to better wages, better working conditions, and to real economic equality based upon no discrimination."[23]

Though CIO unions had a mixed record on protecting the rights of woman workers, at Oak Ridge, AWOC argued that women were integral to the union. It hired Esther Demeo to organize women at TEC, where a majority of women worked, and looked to women who worked at K-25 and X-10 as well. Since women workers at Oak Ridge had seniority, and had not replaced men to get their jobs, they were in a better position to hold their jobs after the war. This made them the margin of victory for the CIO, and their concerns could not be ignored.

The CIO also hired a full-time organizer to work with African American workers at Oak Ridge, who had the lowest paying, hardest jobs, as well as the worst housing conditions. Promises of higher wages were especially relevant in the black community, whose members predominantly held maintenance positions in the plants.

The CIO stressed that it fought the military on behalf of workers. The CIO paper at Oak Ridge, the *Atomic Worker*, claimed that it introduced "a free and unfettered press" to Oak Ridge, and that it had "brought freedom of expression to Oak Ridge," and had given "pitiless publicity to injustices at Oak Ridge," making it "like a fresh ocean breeze blowing after a hot sultry day."[24]

The CIO also tried to shed its radical image and embrace a more respectable and rural image for the campaign at Oak Ridge. Shortly after the drive began, Tennessee CIO Director Paul Christopher sought religious allies to shore up his position, hoping that organizations such as the Knoxville Religion and Labor Fellowship could deflect

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[20]*AWOC*, June 1946.

[21]*AW*, July 5, 1946.

[22]*AWOC*, May 1946.

[23]"The Woman and Her Job at TEC," *AWOC*.

[24]August 16, 1946. *AWOC*.

from these charges.[25] AWOC, smarting from charges that the CIO was un-American, told its members that it was a "union that believes in and practices true democracy; a union that is as American as Thomas Jefferson, Abraham Lincoln or George Washington."[26]

Christopher also sought to keep left-wing protest out of the area. He wrote to the Workers' Defense League, who proposed a peace demonstration for the area, "If this is done, ... you will have done irreparable harm to our current organizing drive among these workers. We will be forced to take drastic measures to denounce your program, which we would not like to do."[27] Though the *Atomic Worker* carried news stories about the atomic scientists movement, as well as the debates over civilian control of the atom, it avoided taking sides in policy disputes such as that around the Bikini atomic bomb tests, for fear of alienating workers.

The CIO utilized some of the traditional entertainment of Tennessee — the Atomic Worker newspaper had an "old-Timers" column full of rural jokes that were old in 1946. It also used music in its drive. Lyric sheets survive for the songs "The CIO Makes Us Strong" ("Solidarity Forever"), "Oak Ridge Valley" ("Red River Valley"), and "Put On Your CIO Button" ("Put On Your Old Gray Bonnet"). These songs contained a new message, unionism, to old tunes. "Put On Your CIO Button" promises, "When the struggle's over/we'll be in the clover/bargaining collectively."[28] In this way, the CIO attempted to integrate existing "folk culture" in a new, industrial environment.

The CIO sought to organize Oak Ridge through mobilization of workers' desire to live a better, more secure, less regimented life. It stressed freedom, security, and the end of military rule at the facility, and promised equality for all who worked there. The CIO in Oak Ridge embraced the cause of women and blacks to a far greater extent than in other areas of the South. In order to avoid losing elections, the AFL had to try to attract these groups, though they did not try as hard as the CIO.

The AFL campaign for Oak Ridge

The AFL campaign at Oak Ridge revolved around the theme of Americanism. AFL publications sought to assure workers who had never been part of a union that the AFL, and unions in general, were an American tradition. In the AFL's *Knoxville Labor News*, Oak Ridge edition, the AFL told workers that "Oak Ridge workers, coming from school room and farm at the call of their country have had little opportunity to learn of vote procedure in National Labor Relations Board Elections." The AFL assured workers that the NLRB and AFL were "American" and not subversive institutions. AFL campaigns went so far as to claim that "The AFL has the right to wave old glory!"[29] Not only was the AFL the most American union, it was, "more typically American than all national groups. The historic mission of the American Federation of

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[25]Christopher to Ramsay, June 15, 1946, *OD*.

[26]*AWOC*, June 1946.

[27]Christopher to Peck, June 12, 1946. *OD*.

[28]CIO Songsheet found in *AWOC*.

[29]*Knoxville Labor News*, August 1, 1946. [Hereinafter, *KLN*]

Labor is to spread prosperity. There is no place in AFL for Communists, PAC or similar front groups; It is Deep Rooted in the American Soul."[30]

The AFL attacked the CIO as a Communist-dominated organization, charging that Charles Doyle, an officer in the CIO Chemical Workers Union was a Communist, and had been arrested and found with communist literature in his car in 1937. The AFL asked, "Has anybody here seen Doyle— Communist Member of CIO Board?" and printed his mug shot on the front page of their newspaper.[31] This insinuation that Doyle was in Oak Ridge was simply speculation, as Doyle lived and worked in Niagara Falls.

The AFL made a firm stand against the military and company rule of Oak Ridge. It would not submit its periodicals for pre-distribution review by the military, and in July, the military dropped this requirement. It also attacked the General who was in charge of the Manhattan Project, General Leslie Groves, as an overrated, publicity-seeking fraud. An issue of the Knoxville Labor News told readers, "General Groves not so hot here in the Atomic City."[32]

In the case of woman workers, the A.F. of L. advertised that it had ended the 72 hour week for women in manufacturing establishments, and claimed that workers "now enjoy the 40 hour week with price and one half for overtime; all because of the long, hard struggle made by the AFL."[33] Like the CIO, the AFL also asked the vote of women workers on the grounds that it had supported "equal pay for equal work," and an end to wage differentials between male and female workers.[34]

However, there was a strong patriarchal element to AFL appeals to workers. One AFL flier reminded men, "You be the judge— You are head of your own household. You have to be the judge of what is best for your own family."[35] The AFL pamphlet "Women in Industry and in the Home" shows that the AFL was more comfortable appealing to family values than to woman workers. The AFL told women, "Many men have died that women might have better lives," and that "industry gradually shackled American womanhood to the machine, doing so for the sole purpose of reducing wages and increasing profits."[36] This would indicate that the AFL was interested in freeing women from the shackles of industry, but it is unclear whether this would come through improvement of conditions or by replacement by male AFL workers.

Though the AFL was uneasy about the propriety of women in factory jobs, it did recognize a need for their votes in the NLRB elections. The AFL wrote in one publication, "These women [at Oak Ridge factories] are not free. Any one of them can be terminated at the will or whim of the boss. They have no job security, no seniority rights, no grievance procedure, no voice in anything pertaining to their working conditions, wages, hours, or

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[30]*KLN* ,June 20, 1946.

[31]*KLN*, August 15, 1946.

[32] *KLN*, June 20, 1946.

[33]"Some things which the AFL has done for workers of Oak Ridge." AFL press release. Found in RG 326, Industrial Relations Collection, at Federal Records Center, East Pointe, Ga. [Hereinafter, *AFL*]

[34]"Women in Industry and the Home." *AFL.*

[35]"You be the judge." *AFL.*

[36]"Women in Industry and the Home." *AFL.*

conditions of employment."[37] The sheer number of women working at Oak Ridge meant that they could not be ignored in union elections, forcing the AFL into a more liberal position on matters of working women than it otherwise might have taken in the South.

On matters of race, the AFL would only go so far as to sponsor a party for black workers before the election: it never mentioned them in their literature. However, the campaign remained free of racial slurs or divisions, for fear that any votes lost in the election could spell total defeat for the AFL.

The CIO in the Final Stretch

The AWOC campaign received a boost on July 19, 1946, when TEC announced a layoff of 1,500 workers. The CIO used this as an opportunity to press for seniority rights that would protect workers who had worked at Oak Ridge the longest. AWOC asked workers, "Can you find another job? Can you find another place to live elsewhere in an already crowded community? Can you afford to pay excessive and exorbitant rents in already overcrowded communities since OPA [Office of Price Administration] was allowed to die? Should you or your associates have to live in this atmosphere of fear, uncertainty and insecurity?"[38] These dismissals helped the CIO at Oak Ridge, demonstrating that company-backed prosperity would not remain forever.

The CIO still found signing up dues-paying members difficult. Organizers had signed up only 1,605 members in Oak Ridge by June 21, 1946, and only 975 of these had paid dues to the union. Organizing was particularly weak at Monsanto, which was being organized at the rate of four workers per week, lagging behind every other plant and category of worker. Workers at Tennessee Eastman were slow to join the CIO, as they were joining at roughly half the rate of Carbon and Carbide workers (72/week versus 44/week).[39]

The volunteer organizers in which Christopher and Danenburg had placed their faith in had proven to be a disappointment. Christopher wrote to organizer Elmer Darnell, "On May 20, you signed up and promised to come by the office the following Thursday in order to pay your $1 initiation fee in the AWOC. You also took some cards and promised to sign up some of your buddies. Something must have happened to you. I know you would not intentionally let this slip by unless something was wrong. Won't you kindly telephone me ... and let me know something."[40]

The CIO sought to warn workers against charges of Communism by the AFL or employers, and to bring the issue out in the open. "Smoke Screen Ahead," read one CIO handout, which told workers, "They're sure to resort to the old smoke screen! They'll try to hide the real issues with lies, half-truths and misleading statements. And in final desperation, one of them is sure to drag out that OLD RED HERRING! ... So when this happens, we know you'll see it for what it really is— an insult to your intelligence."[41]

In late July 1946, the CIO publicly predicted that it would win a majority vote at Carbon and Carbide, but that workers should aim for a "100 percent" victory in order to bolster the "CIO bargaining policy." It also told workers at TEC that "an analysis of

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[37]"Women in Industry and the Home." *AFL*.

[38]*AWOC*, July 19, 1946.

[39]Christopher to Darrymple June 24, 1945, *OD*.

[40]Christopher to Darnell, June 4, 1946, *OD*.

[41]Smoke Screen, *OD*.

the straw poll conducted a few days ago... [shows that] if the election had been held on August 1st, TEC employees would have voted 69.2 percent in favor of CIO." It concluded "Let's get the 90 percent vote!"[42]

However, internal AWOC records show that there was no such majority in the plants. In fact, membership totals were far below what had been hoped for. There were 1,509 members at Carbon and Carbide, 67 of Monsanto and 1,095 of Tennessee Eastman. CIO membership was only one-third at Carbon and Carbide, one-fifth at Tennessee Eastman, and one-eighth at Monsanto. Attempts to inflate CIO membership were undertaken in the belief that workers would vote for the CIO if they believed that it was a sure thing.

The NLRB Election- Round One

Over 90 percent of workers cast ballots in the NLRB elections held on August 21, 1946. The results of the first round of the election were that in all three elections, a runoff was needed, since in no case did a union, or the category "no union," win a majority of votes.[43]

Company	CIO	AFL	No Union
Tennessee Eastman	1531	1721	2579
Monsanto	121	289	176
Carbide and Carbon	1429	1612	1373

These elections being inconclusive, a second round of balloting was scheduled for September 10-12, 1946. Under NLRB regulations, if "Neither Union" is in second place in the balloting, but one other union receives 20% of the vote, "Neither" does not go on the runoff ballot, much to the dismay of employers like Monsanto, who sought to keep "no union" on the ballot.[44]

When the election results came in, the CIO leadership was disappointed with the results, but did not despair. Operation Dixie director Van Bittner wired his organizers, "Tell the boys not to worry about the results of the election at Oak Ridge. I know you all did everything humanly possible and that's the best anyone can do. Keep your chin up." [45]

The CIO explained its poor showing to workers of Oak Ridge by noting, "CIO has been in Oak Ridge about three months. Other unions have been in Oak Ridge for more than three years." *The Atomic Worker* continued to press for victory at Carbide and Carbon and Monsanto in the runoff. It told workers, "Organize— CIO victory is

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[42]*AWOC*, August 5, 1945.

[43]MED Labor Diary, Oak Ridge, Entry for August 23, 1946. In RG 326, Industrial Relations Collection, at Federal Records Center, East Pointe, Ga.

[44]MED Labor Diary, Oak Ridge, Entry for August 28, 1946. In RG 326, Industrial Relations Collection, at Federal Records Center, East Pointe, Ga.

[45]August 23, 1946. *OD*.

within the grasp of every CIO member and worker in Carbide and Monsanto."[46] The CIO urged TEC workers to vote "no union" so that the CIO could petition for another election. The CIO also promised a $1 initiation fee (free to veterans) and maximum dues of $1.50 per month, unlike AFL's high initiation fees (sometimes over $100) in addition to dues and assessments. Finally, the CIO promised one union for all production workers, and raised the possibility that production workers could be split into many different unions under the AFL— including the "hod carriers and common laborers international union." It asked workers, "Can you afford to be classified as a hod carrier or laborer?"[47] For many workers, the title "Hod carrier" was meaningless, making the AFL system of separate unions seem complex and ridiculous. The CIO also represented a step up for unskilled workers in the plants; a CIO victory would make all Oak Ridge workers equal in one union, reducing the importance of the line between skilled and unskilled workers.

NLRB Elections - Round 2

The second round of NLRB elections, held on September 10 through September 12, split the Oak Ridge workforce along three separate lines. Monsanto, the smallest employer, went to the AF of L by a 2-1 margin. At Carbide, the CIO won its only victory, by the slim margin of 1,918 to 1,893. At TEC, "No Union" won, 3,120 to 2,503. In all three elections, turnout exceeded 70 percent, with 88 percent of workers voting at Carbide and 91 percent voting at TEC.

The AF of L challenged the vote count at Carbide, claiming that ballots had been improperly filled out, though the NLRB did not uphold this challenge. The MED noted that the election led to "extreme tension and threats of violence." AFL leaders charged NLRB and CIO with cheating and also vilified the contractors and the Army. When Mr. Crawford of the CIO told AFL leader James Stewart, "Congratulations on Monsanto, tough luck on the other two," Stewart responded, "Yes, thanks to you, and give the Colonel my thanks. We'll get you s.o.b.'s yet."[48]

The situation only got more tense during the recount that night, when AFL leaders, described by the MED reports as "drunk- a fact which made their charges more reckless and also increased the possibility of violence," charged that the NLRB had fixed the election. The ballots were escorted to the train station in a police radio car, and put on the midnight train to Washington to safeguard the ballots. The police were called by MED and the meeting ended without violence on their arrival.[49]

The outcome of the election campaign gave both sides a victory (Carbide for CIO, Monsanto for AFL) but left the largest employer (TEC) unorganized altogether. The bitterness between AFL and CIO did not end with the election, but continued as a rivalry for members and for prestige. The stalemate at Oak Ridge was symbolic of the larger stalemate of the labor movement— the AFL and CIO were locked in an inconclusive, mutually destructive conflict, while thousands of workers remained without the protection of a union.

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[46]*AW*, Volume 1, #15.

[47]*AWOC*, September 5, 1946.

[48]MED Labor Diary, Oak Ridge, Entry for Sept 12, 1946. In RG 326, Industrial Relations Collection, at Federal Records Center, East Pointe, Ga.

[49]MED Labor Diary, Oak Ridge, Entry for Sept 13, 1946. In RG 326, Industrial Relations Collection, at Federal Records Center, East Pointe, Ga.

Several factors might help explain why the union drives at Oak Ridge were relatively successful while the CIO and AFL drives in the rest of the South failed. The CIO at Oak Ridge sought the votes of African-Americans, as well as the votes of women workers, and this fact accounts for part of their success in the elections. However, more broadly, the CIO and AFL at Oak Ridge each sought to form a broad coalition of all workers to fight for economic rights in the factories at Oak Ridge, but also against the military authorities that ran the city. It was because the struggle for constitutional and labor rights were intertwined at Oak Ridge that the atomic city became a union city in the midst of open-shop territory.

However, in another way, Oak Ridge's 1946 union campaign represents a lost opportunity for the labor movement in general. Had the AFL and CIO come to an agreement about the ground rules of their campaigns, in the name of preserving the good name of the labor movement, fewer workers would have voted no-union. Reading the literature of the period, it is hard to imagine a worker who never had been a union member joining either organization– since one was run by cold-blooded communists, and the other by corrupt racketeers, at least according to each other's literature. With such attacks on one another, the AFL and CIO ceased to discuss the corporations or the military, and thereby squandered their greatest asset — solidarity against a common enemy. In the case of the run-off election at TEC, the CIO strategy of urging workers to vote "no-union" rather than AFL in the runoff was particularly short-sighted, as it meant that these workers would remain ununionized and without elementary job protections or rights.

The legacy of Operation Dixie and the AFL Southern Organizing Campaign was therefore a mixed one. The two labor organizing campaigns helped to bring about economic and political changes at Oak Ridge that were unthinkable only weeks before they began in 1946. Through union struggles, workers at Oak Ridge won the rights of citizenship: free press, free speech and free assembly. Unlike other areas of the South, workers at Oak Ridge organized across race and gender lines with no sign of the "Jim Crow" unionism that persisted in the area. However, the split between the AFL and CIO unions weakened unions in their upcoming negotiations with their employers and the Federal government.

Chapter 7 Federal Government Labor Policy and the Stalemate of Labor Unions at Oak Ridge, 1946 to 1950

The victory of unions at the ballot box in NLRB representation elections, described in the last chapter, did not lead to the changes in Oak Ridge's work places that unions originally promised. Instead, the CIO and AFL victories in Oak Ridge were the beginning of a long, frustrating process of bargaining between unions and contractors over wages, seniority, and working conditions. Between the years 1946 and 1950, these negotiations were marked by repeated stalemates and crises. This stalemate was caused by two factors; first, the passage of the Taft-Hartley Act of 1947 limited the rights of national defense workers to strike; second, the division of workers at Oak Ridge between AFL and CIO unions caused a lack of worker unity during negotiations.

In this chapter, I will assess the causes of this stalemate, and the role that Federal policy played in limiting the power of labor unions at Oak Ridge. I will also describe the debate in labor history over the role of the state as an agent of liberation or regulation for unions and workers. Then, I will examine the changing attitude of liberals towards labor, in the new context of the cold war. Finally, I will analyze contract negotiations at Oak Ridge between 1946 and 1950, and the role of the Federal government in preventing workers from making gains at the bargaining table.

Federal Power in Oak Ridge

The Atomic Energy Commission, a Federal agency, set the ground rules for labor negotiations at Oak Ridge. The AEC was free to hire and replace contractors, to set the rules about what unions could bargain for, and to enjoin strikes and lockouts at the facilities. During the years 1946 to 1950, the AEC used this power to progressively limit the power of labor unions to bargain and to strike.

Oak Ridge is an illustration of how Federal policies shifted from the New Deal-style support of unions, to the cold war restriction of union activities. In the 1930s, the labor movement turned to the Federal government to grant workers the right to organize unions in the workplace; in return, the Roosevelt administration counted on union votes and funds to win election campaigns.

However, by 1946, this relationship had shifted drastically. The Truman administration, though dependent on labor for electoral support, saw union militancy as a threat to national security during the opening of a new "cold war." A new Republican congress restricted workers' and unions' rights in the Taft-Hartley Act of 1947 (NLRA). Under a provision of this act, the President could enjoin strikes or lockouts at any facility necessary for the "health and safety" of the nation.

This shift in national policy meant that Oak Ridge workers and their unions lost power between 1946 and 1950. Though unions struggled to obtain better wages and safer working conditions, collective bargaining did not produce the gains workers had expected when they organized unions. Since AEC facilities such as Oak Ridge were considered vital for national defense, strikes were barred. Without the right to strike, workers could do nothing when bargaining reached an impasse.

This impasse in collective bargaining did not mean that workers did not gain from having unions at Oak Ridge. It meant, however, Federal policy limited what workers could demand, and the areas in which they could challenge management and government authority. Without a right to strike or undertake other workplace action, collective bargaining became a source of frustration, rather than strength, for workers at Oak Ridge.

The most important long term result of this impasse was that issues of workplace health and safety were excluded from negotiations between unions and the companies. Instead, the government and the corporations set the standards for worker exposure to radioactive and other hazardous substances, without oversight from workers or their representatives,

How does Federal Policy Affect Unions?

For the past decade, the impact of Federal involvement on labor union and worker rights has been a subject of debate in twentieth century labor history. Labor historian Christopher Tomlins argues that during the period 1930-60, the Federal government bestowed upon workers a "counterfeit freedom" to organize and bargain collectively with corporations. The New Deal revolution that gave workers the right to organize was a sham, according to Tomlins. Instead, the Federal government used labor unions to restrict workers' rights, rather than protect them.[1]

Labor historians Melvyn Dubofsky and Robert Zieger have questioned Tomlins' view, arguing that the Federal government has been instrumental in the victories of workers since the 1930s. According to Dubofsky and Zieger, when a pro-labor administration supports labor unions, as Franklin Roosevelt's did, unions grow and workers prosper. However, administrations less favorable to labor, such as the Eisenhower administration, can hurt the labor movement.[2]

The central question of this debate is whether government intervention in labor policy is always harmful to labor, as Tomlins argues, or whether it can work for the good of workers, as Dubofky and Zieger argue. In the case of Oak Ridge, government intervention was not favorable to worker and unions between 1946 and 1950. However, this negative relationship was due to the onset of the cold war and anti-labor shifts among liberals, not because of government involvement alone.

The Liberals Turn Against Labor: The Case of AEC Chairman David Lilienthal

When Congress decided in 1945 to place atomic weapons production under the supervision of a new Atomic Energy Commission, it intended to break the military's monopoly on atomic technology and information. Organized labor was overwhelmingly in favor of David Lilienthal's appointment to the AEC when he was nominated. The *C.I.O. News* wrote that Lilienthal was a "Sure Bet" for AEC Chairman. When his nomination was attacked in the Senate, the CIO backed Lilienthal as the choice of the "overwhelming majority of the American people." C.I.O. President Thomas Murray wrote, "The CIO and the American people as a whole are convinced that on any basis of justice, decency or ability to handle the job, Mr. Lilienthal should be confirmed speedily for this new assignment."[3]

From the beginning of his career, Lilienthal had been a supporter of the rights of workers. In his diary entry of December 24, 1919, Lilienthal (then age twenty) wrote, "My greatest interest now, as before, has been in Labor; largely, I believe, because it has so close a human connection. ... My interest in industrial

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[1] Christopher Tomlins, *The State and the Unions: Labor Relations, Law and the Organized Labor Movement in America, 1880-1960.* (Cambridge: Cambridge University Press, 1995).

[2] Melvyn Dubofsky, *The State and Labor in Modern America.* (Chapel Hill: University of North Carolina Press, 1994). Robert Zieger, *The CIO, 1935-1955.* (Chapel Hill: University of North Carolina Press, 1995).

[3] *CIO News*, April 7, 1946, page 12.

conditions and means of ameliorating its undesirable features; my indignation at the inequalities of distribution of wealth, causing a surplus at one extreme and insufficiency for the common decency on the other, has been of relatively long standing."[4] However, he added, "Although my sympathies now as before are with labor, I am trying to preserve to preserve a balance— to suspend my judgement until I am competant to judge." Out of this concern, Lilienthal vowed to become a lawyer who would represent workers and consumers against the corporate giants that ignored their interests.

During his tenure as Chairman of the Tennessee Valley Authority, Lilienthal became disillusioned with labor unions, especially AF of L craft unions. He wrote, "A closed shop removes the necessity for labor officials to stir their bones and do a job for their membership. They become dues collectors. They become just as fat-headed and sterile as they dare to be ... and a closed shop in a tight industry gives the opportunity for about the maximum of inertia and fat-headedness."[5] By the time Lilienthal took up command of the AEC, Tennessee's Senator McKeller and other congressional conservatives had savagely attacked Lilienthal for being too soft on communism and other security risks. Congress and President Truman expected the AEC, unlike the TVA, to work closely with, and not against, corporations in the field. The Federal government did not want the AEC to be a "yardstick" to force private companies to provide better service to the public for less money, as TVA had been; the AEC was to be a cheerleader and midwife to a new industrial applications of atomic energy.

Lilienthal changed his outlook to a pro-business and pro-enterprise stance. He told Oak Ridge unionists in 1948:

> The Commission certainly believes that this atomic industry can never flourish and grow and find its proper place among the elements of our national strength unless it sends its roots deep and wide into the same soil that has nourished the automotive and other industrial giants, the soil of competitive private industry.... We do not forget that the mammoth developments inherited from the Manhattan Project were built, improved and operated by American industry under governmental direction.[6]

In this speech, Lilienthal showed how far his liberalism had come over the years; he had changed from a labor supporter to a corporate booster.

Lilienthal is a prime example of the shift of many New Deal liberals from a pro-labor to pro-corporation position. During his tenure as AEC Chairman, Lilienthal limited union power at the AEC's workplaces, and restricted which unions could represent employees involved in AEC research or production. This shift would have a profound effect at Oak Ridge, as unionists there had been counting on Lilienthal being on their side in their negotiations with their employers.

The First Labor Negotiations at Post War Oak Ridge

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[4]David Lilienthal, *Journals of David Lilienthal*, The Tennessee Valley Authority Years, page 9.

[5]Lilienthal, *Journals*, 597.

[6]David Lilienthal, "Points to be made in discussion with AFL group on X-10 situation tuesday," May 4, 1948. Entry E1, Box 11, "Oak Ridge Labor Dispute" folder. RG 326, National Archives, College Park, Md.

The first round of labor negotiations at Oak Ridge showed workers that the union victories won in 1946 would not produce immediate results. These talks did not produce a transformation of power relations at the work place, but instead provided a modest wage increase, as well as a codification of the seniority and grievance system. Unlike union victories at automobile manufacturers in the 1930s, which created a cadre of militant shopstewards on the shop floor, at Oak Ridge, the AEC and contractor management retained the unconditional "right to manage."

The CIO's United Gas Coke and Chemical Workers [UGCCW] set about negotiating its first contract with Carbon and Carbide in late 1946. C.W. Dannenburg, the union's southern regional director, handled the negotiations for the new local. The membership put the CIO's negotiating team under pressure to bargain quickly to demonstrate their ability to deliver what they had promised during the organizing drive. However, this strategy failed to produce gains for workers; Instead, security restrictions imposed by the AEC in October 1946 stated that any contract between Carbide and the UGCCW would include a clause that made any "stoppage or slowdown" a cause for immediate dismissal. This ban on strikes left the union without recourse in case of disputes. The union also had to agree that the "continuity of operations" would take precedence over any other issue in labor relations.[7]

Throughout October and November, officers of the UGCCW met with Carbon and Carbide and the United States Department of Labor's Federal Mediation and Conciliation Service to work out an agreement. The initial negotiations were hobbled by security regulations. Interim security clearance needed to be arranged for all involved in negotiations.[8] Federal Mediation and Conciliation Service commissioner Hitchcock wrote that information about negotiations was "scanty due to secretiveness of operations in this plant. More complete data to be available upon issuance to commissioner of 'interim clearance' by Army permitting participation in conferences."[9]

On December 10, Carbide and the UGCCW announced that the agreement was complete. It included:

1. 10 cents per hour wage increase
2. Voluntary check off of union affiliation
3. 5 cent premium for second shift, 10 cent premium for third shift
4. Time and a half for holidays worked, nothing for those not worked
5. No provision for sick leave
6. No wage reopening for one year

This contract was not the victory workers had wanted. Though the pay increase was substantial, post-war inflation would almost certainly erode it within a year. The lack of provisions for sick time, holiday pay and vacation pay meant that workers would be on the job constinuously, or have to take unpaid time off.

This contract was disappointing compared to other unions' 1946 victories. In Detroit, the United Auto Workers were attempting to "open the books" of General Motors to link wage raises of 30 cents per hour to corporate profits (The UAW settled for 18 and a half cents). The United Mine Workers, under John L. Lewis, were negotiating for a health

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[7]United States Atomic Energy Commission, "History of labor relations," page 9. Entry 87-07 Box 4, Carbon and Carbide Folder. RG 326, National Archives Regional Branch- East Pointe, Ga.

[8]United States Federal Mediation and Conciliation Service. E.F. Hitchcock, "Progress Report (11-19-49)" Case 464-1765, FMCS Case Files, 1913-48, in RG 280, National Archives, College Park, Md.

[9]E.F. Hitchcock, "Assignment Report, (11-16-46)", FMCS Case Files, 1913-48, Case 464-1765. RG 280, National Archives, College Park, Md.

and welfare fund that would pay for retirement and health benefits of workers and their families. The first UGCCW contract was, by these contemporary standards, anemic.

The AF of L had the benefit of negotiating its contract with Monsanto after the Carbon and Carbide negotiations had concluded. Monsanto had taken over control of the X-10 plant on July 1, 1945, from the University of Chicago, which had run the plant since it had been built by Du Pont in 1943. This fragmentation of ownership may have helped the union in negotiations, as the current team running the plant had only been in place for a little over a year. The union negotiated with Monsanto from November to mid-December, and came to the following agreement with the company on December 17, 1946:

1. A 10 percent wage increase
2. A 5 cent differential for the first shift, and a 10 cent differential for the second and third shifts (This was an original Du Pont policy governing the plant)
3. Apprentices would take 3 years to rise to skilled worker pay rates.
4. Craft rates would run between $1.605 per hour to $1.785 per hour.

This contract was a victory for the AF of L in comparison to the results of the Carbide/UGCCW negotiations. The AF of L had given up differences of pay based on craft (one pay grade for metalworkers, another for pipe-fitters), but instead negotiated one high rate for all workers. Workers would be paid a premium on all shifts, which boosted pay 5 cents per hour.

This contract, in terms of the percentage wage increase, did not overshadow the CIO contract. However, in terms of base wages paid, it meant that workers at Monsanto were the highest paid workers in Oak Ridge, well above their fellow workers at Carbon and Carbide and Tennessee Eastman. Monsanto explained that this high wage rate was due to the fact that wages at X-10 were higher initially to "compensate for the hazard factor."[10] This "hazard factor" is suggestive of the way in which AF of L unions viewed health issues (workers should be paid more for hazardous work), but the contract said nothing about management reducing these hazards.

Monsanto's reasons for negotiating such a favorable contract are an open question. The company may have been considering pulling out of Oak Ridge (as it did one year later), and since labor costs were passed along to the Federal government, wages and benefits were not paid by the company. Other aspects of the contract were more favorable to workers as well. There was "management prerogative" clause in the Monsanto project, which would grant the employer full control over the operation of the work place.

The UGCCW Responds

When the terms of the AFL contract was announced, the UGCCW charged that Monsanto had been more favorable to the AFL than Carbon and Carbide had been to the CIO. Dannenburg took up the issue with the AEC, charging that "the Atomic Energy Commission representative had assured CIO that no other contractor would be permitted to negotiate with a union for a higher wage increases" than the CIO.[11] He also charged the AEC with AFL favoritism, and asked to speak directly to AEC Chairman Lilienthal in Washington, DC. However, the AEC labor relations official at Oak Ridge, Colonel C. A. Nelson, told the union that he was the sole representative for their purposes at Oak Ridge.

In March 1946, the AEC met with the UGCCW negotiating team to discuss grievances about the contract. The UGCCW brought not only the negotiating team, but also

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[10]United States Atomic Energy Commission, "History of labor relations," page 7. Entry 87-07 Box 4, Monsanto, Folder. National Archives Regional Branch- East Pointe, Ga.

[11]United States Atomic Energy Commission, "History of labor relations," page 13. Entry 87-07 Box 4, Carbon and Carbide Folder. RG 326, National Archives Regional Branch- East Pointe, Ga.

fifty shop stewards to the meeting. The union attacked the AEC for favoritism, and the AEC officials responded that "the contract with Carbide had been studied by some of the best qualified Industrial relations men in the country, and that these men uniformly considered the contract an advantageous one from the employee's point of view."[12]

However, the UGCCW persisted in its complaints, and on April 18, 1947, representatives of Carbide and Carbon, the AEC, and the union met in Washington, D.C. to discuss problems with the contract. The union requested that Carbon and Carbide grant UGCCW the same terms Monsanto granted the AF of L, as well as give the union more control in the grievance process. The UGCCW also aimed to allow vacancies in the plant to be posted so that men could "bid" on a job based on seniority. New UGCCW demands included "better sick benefits up to twelve months" and "worker representation on Safety Groups."[13]

On April 29, Carbide accepted a number of these proposals, including "to extend health and accident policies in lieu of sick leave."[14] However, the AEC did not approve the contract until the next month, and added the following stipulations: first, that "continuous and constant operations" must continue under all conditions. Second, "It is recognized that all members of the Union, the Contractor, and all employees of the Contractor are required to comply with all protective security measures now in effect or may be adapted under the authority of the AEC. If any provision of this contract should later be found in conflict with such security measures the security measures shall be deemed to be paramount."[15] This security clause meant that the AEC was the final arbiter of its own policies, as well as those of its contractors and the unions that worked in the facilities.

The AEC Tightens Its Labor Policy

After the first union contracts proved difficult to negotiate, the AEC, in January 1947, appointed a board of labor experts to review union contracts. Labor Lawyer Lloyd Garrison (future counsel to J. Robert Oppenheimer in his 1954 hearings) David Morse and Industrial Relations Professor George Taylor were enlisted to read over the Oak Ridge contracts and suggest changes. The recommendations of the Garrison committee were a sign that liberals were prepared to restrict the rights of unions and workers in the name of national security and secrecy.

These three men, liberals on questions of labor relations, warned that the two contracts provided for different wage and benefit levels. They believed that this could lead to "'whip-lashing' under which each union will try to gain for itself advantages previously obtained by the other, and then to seek further gains on top of that."[16] The committee suggested that perhaps "the plants should be operated by the government rather than by private companies" as this would "bring about a

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[12]United States Atomic Energy Commission, "History of labor relations," page 14. Entry 87-07 Box 4, Carbon and Carbide Folder. RG 326, National Archives Regional Branch- East Pointe, Ga.

[13]United States Atomic Energy Commission, "History of labor relations," page 17. Entry 87-07 Box 4, Carbon and Carbide Folder. RG 326, National Archives Regional Branch- East Pointe, Ga.

[14]United States Atomic Energy Commission, "History of labor relations," page 18. Entry 87-07 Box 4, Carbon and Carbide Folder. RG 326, National Archives Regional Branch- East Pointe, Ga.

[15]United States Atomic Energy Commission, "History of labor relations," page 18. Entry 87-07 Box 4, Carbon and Carbide Folder. RG 326, National Archives Regional Branch- East Pointe, Ga.

[16]United States Atomic Energy Commission. Letter: Garrison, Morse and Taylor to AEC, January 4, 1947. Box 35, AEC Labor Folder. RG 126, National Archives, College Park, Md.

greater uniformity of labor policies" and "the risk of work stoppages might perhaps be less than under private operation."[17]

The Committee noted that both contracts prohibited "strikes, lockouts, work stoppages, picket lines, slowdowns, secondary boycotts or disturbances, even of a momentary nature. The Union guarantees to support the company fully in maintaining operations in every way. Participation by any employee, or employees, in an act violating this provision in any way will be complete and immediate discharge by the Company."[18] The committee did not disagree with these provisions, but suggested stronger security measures.

In the area of security, the Garrison committee suggested that the AEC policy that "The Union and the Company agree that they will do their utmost to protect the security of classified information" be amended to read "nor will any employee or union or company representative be entitled to such information except where the information is necessary for the performance of work desired by the government."[19]

Furthermore, the Garrison committee suggested tightening Army regulations about access to AEC facilities. They suggested that the contract read: "It is recognized that the company has agreed not to employ or to grant access to the plant any person designated by the government whose employment or access to the plant is considered prejudicial to the government, and to remove from this work or from the plant and exclude from the area any person whose continued employment or presence is deemed by the government to be prejudicial to the interests of the Government."[20] In the climate of the cold war, even liberals such as Garrison found that the government had a right to fire those it suspected of subversion without a hearing or trial.

Within the AEC bureaucracy, officials were considering eliminating unions from Oak Ridge and other facilities altogether. Fletcher Waller, Director of Organization and Personnel at the AEC, suggested in June 1947 that "the history of collective bargaining at Oak Ridge and the current unsettled conditions might include the desirability of the commission initiating policy action to bar collective bargaining from all units of the atomic energy program."[21]

The AEC, Waller wrote, had put itself in an untenable position, as both the labor unions and contractors expected the AEC to intervene in disputes between labor and management. Waller wrote, "Both the company and the union recognize that they are placed in a situation [where] their bargaining is merely groping in the dark and not likely to result in any final conclusion."[22] Waller suggested an

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[17]United States Atomic Energy Commission. Letter: Garrison, Morse and Taylor to AEC, January 4, 1947, page 13. Box 35, AEC Labor Folder. RG 126, National Archives, College Park, Md.

[18]United States Atomic Energy Commission. Letter: Garrison, Morse and Taylor to AEC, January 4, 1947, page 13. Box 35, AEC Labor Folder. RG 126, National Archives, College Park, Md.

[19]United States Atomic Energy Commission. Letter: Garrison, Morse and Taylor to AEC, January 4, 1947, page 13. Box 35, AEC Labor Folder. RG 126, National Archives, College Park, Md.

[20]United States Atomic Energy Commission. Letter: Garrison, Morse and Taylor to AEC, January 4, 1947, page 13. Box 35, AEC Labor Folder. RG 126, National Archives, College Park, Md.

[21]United States Atomic Energy Commission. Letter: Waller to Wilson, June 26, 1947. Entry E1, Box 8, Folder "Correspondence: Labor." RG 326, National Archives, College Park, Md.

[22]United States Atomic Energy Commission. Letter: Waller to Wilson, June 26, 1947. Entry E1, Box 8, Folder "Correspondence: Labor." RG 326, National Archives, College Park, Md.

arbitration board, independent of AEC to settle labor disputes, or a system in which AEC practice would be compared to other industries, and set based on prevailing standards of wages, working conditions and benefits.

The Congressional Joint Committee on Atomic Energy [JCAE] undertook an investigation of AEC labor policy in 1947. In January 1948, the AEC reported to the JCAE its guidelines for labor policy. The new AEC guidelines included the following principles for labor relations at AEC facilities:

> a. Wholehearted acceptance by contractors and by labor and its representatives of the moral responsibility inherent in participation in the atomic energy program.
>
> b. Development of procedures to assure that all participants in the program are loyal to the United States, including those whose participation involves the exercise of negotiating and disciplinary authority over bargaining units.
>
> c. Continuity of production at vital AEC installations.
>
> d. The least possible government interference with the efficient management expected from AEC contractors.
>
> e. Minimum interference with the traditional rights and privileges of American labor.[23]

Each of these policies gave unions and workers less power, making point "e" a meaningless gesture. Without a right to strike, workers could have little bargaining power. AEC loyalty policies restricted the unions that workers were allowed to choose as their representatives. In the report to the JCAE, the AEC suggested that its options included: "a denial of the right to join unions, a legal ban on strikes, a ban on strikes accompanied with compulsory arbitration, government determination of conditions of employment, or direct government operation of atomic plants."[24] Within this new, anti-labor context, workers at K-25 and X-10 at Oak Ridge began negotiating their new contracts.

The CIO's Bid for a New Contract

In the context of tightening AEC labor policy, the unions found it more difficult to negotiate contracts with their employers. Federal mediator E.F. Hitchcock told his superiors in July 1947 that the Carbon and Carbide/UGCCW negotiations were stalled, as "relations between the parties are deplorable and marked by an absolute lack of confidence and respect."[25] On August 19, 1947, the UGCCW issued a message to members on health and safety describing the union's frustrated effort to set up a joint health and safety committee. The union also prepared a resolution on health and safety, calling for a "joint committee to investigate the dangers of employment at Carbide, and to give every Carbide employee a thorough examination."[26] The AEC asked the CIO to discontinue issuing these resolutions to the press, as they "contradict the AEC official news bulletin."[27]

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[23]Lilienthal to Hickenlooper, January 16, 1948. Exhibit 1 to Congress, Joint Committee on Atomic Energy, *Labor Policy in Atomic Energy Plants*, 80th Congress, 2nd Session, (Washington, D.C.: GPO, 1948), page 117.

[24], *Labor Policy in Atomic Energy Plants*, page 124.

[25]United States Federal Mediation and Conciliation Service. Eloise Stewart, "Bargaining History" July 20, 1946 46. Box 2209, Case 474-965. RG 280, National Archives, College Park, Md.

On September 1, 1947, the UGCCW held a bargaining unit meeting for members to hear about the Carbide Corporation's latest offer. Three hundred employees met at the CIO union hall, and were told that 31 union requests had been turned down by the company, which instead proposed 6 items for worker concessions. The workers unanimously rejected the company's offer, and instead allocated $5,000 to send a committee to Washington, DC to "discuss health, safety, lack of good faith in bargaining... with the AEC, the JCAE and the President."[28] The union planned a motorcade to travel to Washington, D.C. loaded with petitions from workers for better wages and working conditions.

During the union meeting, the AEC noted, "Several voices suggested that the employees 'go fishing'" and absent themselves from their jobs, rather than submit to Carbide's conditions. Wildcat strikes clearly would be a breach of the contract signed by the UGCCW in January, but for workers frustrated with the pace of negotiations, it seemed more viable than waiting for Federal intervention in the dispute.[29]

In order to bring pressure on their employers and the AEC, on September 2, 1947, the UGCCW organized "Oak Ridge's First Labor Day Celebration." At noon, a parade marched from the CIO union hall through the town to the picnic area. The parade of cars and trucks, bearing CIO signs was two miles long, with color guards from the VFW and American Legion. Speakers at the rally included CIO National Organizing Director Van Bittner, UGCCW president Martin Wagner and CIO Tennessee Director Paul Christopher, as well as House Representative Estes Kefauver, who, the AEC recorded in its labor diary, "is much more violent in his denunciation of Taft-Hartley than any of the union men."[30]

On September 11, 1947, the CIO released a statement, "Will Carbide Agree to Arbitration?" The union declared, "If the right to strike ... has been curtailed or removed, a substitute must be found - and the only known substitute is arbitration." The UGCCW further charged that Carbide had "failed to bargain in good faith" and that "Carbide hope[s] to be able to boast that Local 288 was their first victory under the Taft-Hartley Act." Health and safety was also an issue, as the UGCCW asked "Why should Carbide get so upset when the Union requested an impartial investigation in respect to health conditions at Carbide after the death of Wilton Rhodes Earle? If health and safety conditions at the plant were proper, why should Carbide hesitate to endorse an impartial investigation?"[31]

On September 15, 1947, the CIO issued its final offer to the company. The CIO demanded a fairer disciplinary and grievance system, that workers receive sick pay, that the company should pay for all safety equipment, including work clothes, and that the company "set up a Health and Safety Committee composed of representatives of the

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[26]United States Army. Manhattan Engineer District. Oak Ridge, Entry for August 19, 1947. RG 326, Industrial Relations Collection, at Federal Records Center, East Pointe, Ga.

[27]United States Army. Manhattan Engineer District. Oak Ridge, Entry for August 21, 1947. RG 326, Industrial Relations Collection, at Federal Records Center, East Pointe, Ga.

[28]United States Army. Manhattan Engineer District. Labor Diary, Oak Ridge, Entry for September 1-2, 1947. RG 326, Industrial Relations Collection, at Federal Records Center, East Pointe, Ga.

[29]United States Army. Manhattan Engineer District. Labor Diary, Oak Ridge, Entry for September 1-2, 1947. RG 326, Industrial Relations Collection, at Federal Records Center, East Pointe, Ga.

[30]United States Army. Manhattan Engineer District. Labor Diary, Oak Ridge, Entry for September 1-2, 1947. RG 326, Industrial Relations Collection, at Federal Records Center, East Pointe, Ga.

[31]United States Federal Mediation and Conciliation Service, Will Carbide Accept Arbitration," September 11, 1947, Case 474-965, FMCS Case Files, 1913-48, Box 2209 in RG 280, National Archives, College Park, Md.

Company and Union."[32] The Union also requested that it "participate in job evaluations and job studies," and that workers "have access to his own records."[33]

The UGCCW set a date of October 28 for a motorcade to Washington, despite requests from the AEC to postpone or cancel it. However, the motorcade never took place, as the UGCCW "agreed to postpone caravan in the event of agreement [on holiday pay]." On December 4, 1947, the UGCCW membership voted that if the contract was not negotiated by the expiration date of the old contract, December 9, the union leadership had the authority to call for an immediate walkout. This situation immediately caused the AEC, and the White House to recognize the magnitude of the conflict.

Benjamin Sigal recalled that "The membership of the union certainly wanted to demonstrate that they are not second-class citizens, as the circumstances seemed to indicate the officials of this Government thought that they were. There was a resentment against the attitude that 'You have got to settle your disputes the way any employees of private contractors settle their disputes,' and on the other hand saying, 'You cannot strike.'"[34] Sigal, however, denied that the men were prepared to strike K-25 if the deadline for a new contract was not met. He told the JCAE, that "No authorized person, official or otherwise, made any such statement as that there was a deadline, and that a strike would be called if the deadline were passed."[35]

The FMCS, the Federal body responsible for assisting with labor negotiations, began preparing papers on December 6 that would allow President Truman to invoke the emergency "cooling-off period" in the Taft-Hartley Act to stop a strike at Oak Ridge. However, the UGCCW went back to the negotiating table with Carbon and Carbide, and on December 11 at 5 a.m., a settlement was reached.

X-10 Dispute and Taft-Hartley

On the heels of the tense dispute between Carbon and Carbide and the CIO, the AF of L began renegotiating their contract at X-10. The plant was now run by the same contractor, Carbon and Carbide, that ran K-25 and Y-12. X-10 was an AF of L stronghold, and paid the highest wages of any of the area plants. In the new negotiations, the AF of L was pledged to further gains, while Carbon and Carbide sought to lower pay and benefits at the plant to the level of other Oak Ridge facilities.

When the AEC asked Carbon and Carbide to take over the management of X-10, workers at the plant immediately realized that the company would attempt to bring wage levels at X-10 down to the level of Y-12 and K-25. The AF of L craft unions at X-10 protested to Lilienthal on January 15, 1948:

> We are deeply concerned over and in opposition to the proposed change in Clinton National Laboratory ... We feel that it creates an unhealthy condition for Labor if one company should gain control of all the operating plants in Oak Ridge engaged in Atomic Energy work. This would tend to give them a monopolistic hold on work being done here as well as on the workers doing it.... We feel

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[32]United States Army. Manhattan Engineer District. Labor Diary, Oak Ridge, Entry for September 15, 1947. RG 326, Industrial Relations Collection, at Federal Records Center, East Pointe, Ga.

[33]United States Army. Manhattan Engineer District. Labor Diary, Oak Ridge, Entry for September 15, 1947. RG 326, Industrial Relations Collection, at Federal Records Center, East Pointe, Ga.

[34] *Labor Policy in Atomic Energy Plants*, page 66.

[35] *Labor Policy in Atomic Energy Plants*, page 69.

> that it would create an undesirable condition for our nation and our people to have the experience and knowledge to be gained in working with atomic energy and nuclear physics concentrated in a few companies, especially those with a strict industrial nature. ... We respectfully request the Commission to reconsider their decision in this transition in view of the above-mentioned factors. We further request an audience with the Commission as our interest on a basis of national welfare, national security and as taxpayers are mutual.[36]

Workers feared that Carbon and Carbide would reduce wages, eliminate workers' 90 days unpaid sick leave, and stop providing safety and protective equipment and clothing to the workers free of charge. Carbide and Carbon took the approach that X-10 workers should receive the same wages and benefits as other Carbide workers: less pay, fewer benefits, and no free protective equipment and clothing.

The question of safety equipment therefore became a factor in these negotiations. The Presidential Fact Finding Board appointed by President Truman to study the dispute noted that "the Union contends that employment in the laboratory entails greater hazard than in the other two plants" and that "work at the Laboratory exposes its members to potential hazards of unknown kind and degree."[37]

Journalist Victor Reisel of the New York Post visited Oak Ridge in March 1948 and found workers "furious enough to quit working at X-10."[38] Not only was the dispute over wages a factor in the strike, but Reisel found workers angry about working conditions and sick leave policies. He wrote that the work at Oak Ridge was "dangerous... The mystery of unseen radioactive waves add terror" to the job. Workers "wear little danger meters- some round, some like pencils— on their shirt pockets or coat lapels and the doctors make the rounds regularly to keep men from collapsing as the invisible rays eat into the blood cells. Just before that the men turn listless and lethargic, act like robots."

The demand for sick leave, Reisel wrote, was justified as "some of [the workers] need the rest. Collapses are frequent and X-10 men don't die. They are weakened by radioactivity... and [are] highly susceptible to the common cold, pneumonia, influenza, and other virus floating about at the moment. The X-10 experimental workers suddenly grow dull and move mechanically and need two days' rest to tone them up again." This sickness had even affected union negotiations, as "one [union] committee member collapsed in Washington while waiting to meet Mr. Truman's belated special Conciliation Board. The atomic worker, weakened by work at X-10 and the trip up to the capital, had to be taken back to Oak Ridge by car."

Therefore, the company's desire to "restrict issuance of protective clothing" was a major stumbling block in negotiations, as was the difference between the wage increase the union sought (15 cents per hour) and the increase the company offered (8 cents per hour). Reisel chided the company and the AEC for being "silly" as the "Government and the Atomic Energy Commission hasn't had the sense to look down and see that the mighty atom is split by the hands of working people, who scare like the rest of us, and have as high a cost of living as the rest of us."

With an immediate impasse in the negotiations, the talks were transferred from Oak Ridge to Washington, DC, where top officials at the AF of L, Union Carbide, and the

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[36]John Greene and Glen Neely to David Lilienthal, January 7, 1948. Entry E1, Box 8, Folder "Correspondence- Labor." RG 326, National Archives, College Park, Md.

[37]U.S. Board of Inquiry Created by Executive Order 9934. Second Report to the President on the Labor Dispute at Oak Ridge National Laboriatory. Washington, D.C.: United States Government Printing Office. United States Department Of Labor Library.

[38]Reisel, "Inside Labor," *New York Post*, March 9, 1948.

FMCS attempted to resolve the dispute. On March 19, news services reported that the workers were due to strike at midnight, and that "only an injunction can halt the walkout." Carbide Vice-President Silas Pickering told reporters that there were only two ways to avert a strike: "The government could get an injunction, or the union can give in completely to all company terms."[39]

After a month of failure in negotiations, President Truman invoked the Taft-Hartley emergency provisions at X-10, forbidding any strikes, lockouts, change of practices or change of employment status on the part of the union or the company. Federal District Judge George Taylor heard the case for an injunction, which would enjoin AFL from "encouraging, causing or engaging in a strike ... or in any manner interfering with or affecting the orderly continuance of work" at Oak Ridge, and bar the Carbon and Carbide Chemicals Corporation from "making any changes in the wages, terms and conditions of employment."[40]

This action infuriated both the AFL leadership and its rank and file. Though they had pledged, two years earlier never to strike at Oak Ridge, the AFL prided itself on its voluntaristic approach to labor relations— in which union and employer hammered out their differences, man to man. Workers saw the intervention of Truman in this matter, locking workers into their jobs and into their present contract, as a denial of their rights as citizens and workers.

AFL official James A. Brownslow told the Joint Committee on Atomic Energy that it was not effective to legislate an end to strikes. "Strikes don't just come about," he told the committee. "There had to be a reason for them. There has to be a cause for a strike. And one of the principal causes, of course, has been the adjudication of wages."[41] If the contractor fails to bargain in good faith, with workers having no right to strike, Brownslow saw a need for Federal intervention. He told the committee, "I think it is time that the Atomic Energy Commission stepped up and assumed some responsibility for relations practices in these plants."[42]

Workers at X-10 who wrote to the JCAE were more angry than Brownslow at the AEC and Carbide. James Weber, of Oak Ridge, wrote to the JCAE, "While you are making a law forbidding a man's right to strike, how about making one giving him the same rights that other Americans enjoy? The class segregation on housing is enough to get any one disgusted with Oak Ridge. Have you examined the labor turnover at Oak Ridge? How do you think this situation affects the security of the project? I have been here less than one year and do not intend to stay much longer and in view of the present situation here, would hardly recommend anyone else coming here. I would like to see the Joint Committee look into the housing situation."[43]

This sentiment was shared by other AF of L workers at Oak Ridge. On June 8, 1948, a mass meeting of X-10 workers gathered to denounce Lilienthal and the other AEC Commissioners. The resolution read:

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[39]Statement of Silas Pickering, Entry 67A803, Box 14, Folder: "004.07-Carbon and Carbide Chemicals Corporation- Labor." RG 326, National Archives, East Pointe, Ga.

[40]Temporary Injunction of Justice George O. Taylor. Entry 67A803, Box 14, Folder 004.07, "Carbon and Carbide Chemical Coroporation-Labor." In RG 326, Industrial Relations Collection, at Federal Records Center, East Pointe, Ga.

[41]*Labor Policy in Atomic Energy Plants*, page 51.

[42]*Labor Policy in Atomic Energy Plants*, page 54.

[43]Weber to Joint Committee on Atomic Energy, March 10, 1948. Box 492 Folder: "Oak Ridge Labor" RG 126, National Archives, College Park, Md.

> Whereas the workers at X-10 (ORNL) do hereby go on record as opposing David Lilienthal for any reconfirmation as chairman of the AEC because of his open support to a vicious contractor in our lengthy labor dispute. Lilienthal's statement that if the X-10 workers strike the commission would order Carbide to operate the laboratory shows clearly that he is no longer the worker's friend. We further condemn him for his implied strike-breaking tactics. Therefore be it resolved that we respectfully request our various international unions and the public to oppose Mr. Lilienthal and his fellow commissioners reconfirmation to the AEC, as being too small in stature to assume and carry out the vast responsibilities necessary to protect our national interest and welfare.[44]

The struggle for decent contracts and better working conditions ended, in 1948, a in stalemate. However, it is important to note that the stalemate was not just between workers and corporations, but also between workers and Federal government. At Oak Ridge it was clear that the government encouragement of unions during the 1930s was over, and that a new order of union regulation and narrow contract negotiations had set in. Tragically, this narrow focus of bargaining foreclosed negotiations on the most vital of issues to workers at Oak Ridge over the long term- the health and safety effects of working at the atomic plants.

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[44]AFL to Lilienthal, Entry E1, Box 11, Folder: "Oak Ridge Labor Dispute." RG 326, National Archives, College Park, Md.

Union representation changed many aspects of life at Oak Ridge. As shown in the Chapter 5, labor organization at Oak Ridge transformed the community and workplace lives of its residents. Workers, acting collectively, changed a great deal of the structure set up by the MED during World War II. However, the negotiations described in Chapter 6, though they led to gains in wages, benefits, seniority and grievance procedure, failed to give workers a voice in many areas of the workplace. The most important area that remained untouched by union contracts was health and safety standards in the plants, which remained the domain of the AEC and its contractors.

In this chapter, I examine how the Manhattan Project, and the AEC kept workers from learning about the hazards of radiation, the causes of diseases originating in their workplace, or about the human experimentation on workers that went on at Oak Ridge during the postwar period. In each case, the MED and AEC tried to keep workers from asking question about the risks and dangers associated with radioactive substances and their use.

The MED and AEC's Cover-Up of Evidence that Radiation Causes Cancer

Much of the scientific and medical evidence of the danger from radiation and radioactive substances was never allowed out of the Manhattan Project's classified records. The results of animal studies that proved the link between exposure to radiation and cancer were considered especially sensitive. During and after the Manhattan Project, General Leslie Groves denied that radiation produced adverse effects, including cancer, either among workers at Oak Ridge and Hanford or survivors of the bombing at Hiroshima and Nagasaki. After the bombing of Hiroshima and Nagasaki, journalist Wilfred Burchett reported the presence of radiation sickness and burns among Japanese survivors of the blast. The MED denied the charge that radiation had harmed the survivors, and the American occupation government censored information published in the Japanese press about the radiation effects of atomic weapons.[1]

Robert Stone, a Associate Medical Director for the Manhattan Project, wrote to Arthur Compton in September 1945 that scientists on the Project should come forward and let the world know that radiation did cause injury at Hiroshima and Nagasaki. In a memo entitled, "Repression of News Regarding Radioactivity Associated with the Atomic Bomb," Stone argued that "there has been a concerted effort to suppress any information or speculation regarding radioactivity and its probable effects." As an example, Stone notes that Groves, "was reported in the *Knoxville New Sentinel* as making light of the question of the radioactivity, and as explaining reports from Japan of deaths from radiation as Japanese propaganda."

Stone wrote, "I think that a frank, open statement of the fact that radiations are involved and may have caused deaths is a much safer and saner policy than one of trying to evade the issue. Eventually, the latter policy will reflect back not only on the integrity of the Manhattan Project but of all scientists connected with it." Stone also had unsuccessfully suggested that the Project "see that the Japanese were properly informed of the radiation hazards that might exist, and of the possible danger to relief workers going into the Hiroshima area."

Stone concluded that "the control of information regarding the effects of the atomic bomb and the accompanying hazards has been of such dictatorial and seemingly unreasonable character that many project personnel have rebelled inwardly and might at any time rebel outwardly.... Since the war is over and there is no enemy to aid, ... it is against

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[1] Wilfred Burchett, *Shadows of Hiroshima.* (London: Verso, 1983).

the true spirit of democracy to essentially order those of us who have different views from the 'official' one to remain silent."[2] However, scientists and physicians such as Stone remained silent on the issue, or joined their voices with those claiming that the Project was safe.

The Manhattan Project kept classified scientific evidence, produced by MED scientists, that radiation and radioactive substances cause cancer. In March 1946, the M.E.D. Public Relations Office halted declassification of three scientific manuscripts produced at Oak Ridge by government scientists on radiation and cancer. These papers, which included "Induction Tumors in Rats With Beta Rays From P32" and "Carcinogenic Effects of Fast Neutrons and Gamma Rays on the Lungs of Mice," demonstrated that a single high level dose of radiation could lead to skin and subcutaneous cancer, with rats dying two to three months after exposure.[3]

In May 1947, the AEC Medical Section informed the declassification division that a similar paper on "studies on the inhalation of fissionable materials and fission products and their subsequent fate in rats and man" should remain classified. This was due to the fact that "plutonium and fission products are at present controlled and handled by the AEC installations only, ... the withholding of this report will not materially affect the outcome of any outside research."[4] The MED also suggested that "at least one human experimentation case is discussed in the latter part of this document, and because of medico-legal reasons, it is deemed inadvisable at this time to release this information."[5] This reference to "medico-legal reasons" shows that fears of being sued outweighted publishing the results of studies on the biology of cancer.

The situation did not change with the transition to the AEC. In 1947, the newly formed AEC began reclassifying work that had previously been declassified, finding new reasons to impose security conditions in cancer research. Papers on the "Distribution and Excretion of Plutonium" and "Uranium Excretion Studies" were found to "involve matters that might be prejudicial to the best interests of the Atomic Energy Commission."[6] Both the MED and AEC wished to maintain the public image of a benevolent agency, not one whose activities harmed workers or would lead to publicity about the AEC's human experimentation program.

Post-War Compensation claims

The Manhattan Engineer District and the Atomic Energy Commission both regarded occupational exposure and disease claims as a threat to the security of the Oak Ridge facility. For this reason, the MED and AEC personnel at Oak Ridge sought to keep such claims out of court, whenever possible. Since Tennessee's workmen's compensation laws

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[2]United States Army. Manhattan Engineer District. Stone to Compton, September 5, 1945, General Correspondence: Folder 729.3. RG 77, National Archives, College Park, Md.

[3]United States Army. Manhattan Engineer District. Robinson to Groves, March 15, 1945. Folder 700.2, "Medical research of bomb casualties." Entry 5, Box 182. RG 77, National Archives, College Park, Md.

[4]United States Atomic Energy Commission. Brundage to Marshall, May 15, 1947. Document: ORFO0245. Public Reading Room, Oak Ridge Operations Office.

[5]United States Atomic Energy Commission. Brundage to Marshall, May 15, 1947. ORFO0245. Public Reading Room, Oak Ridge Operations Office

[6]United States Atomic Energy Commission. Batson to Young, March 21, 1947. ORAU 1531, Public Reading Room, Oak Ridge Operations Office.

required a claimant to sue in a state court in order to be paid compensation, this meant that every occupational injury claim would be heard in open court, in the community in which Oak Ridge was located (Anderson County).

The Commission had local workmen's compensation claims transferred to the U.S. District Federal Court in Knoxville, where the cases could be handled in a more circumspect manner than in an open local courtroom. With the help of the U.S. Attorney for Knoxville, the A.E.C. discouraged cases from being filed, or if the party could not be deterred, settled cases out of court with a minimum of publicity and payoff. Even when the MED or AEC admitted internally that individuals had been harmed by working on the project, they refused to admit responsibility publicly, and offered only small amounts of compensation to victims.

In 1947, a man who had worked at Oak Ridge during the war claimed that occupational exposure to chemicals used in the vacuum shop affected his ability to breathe. The man asked $50,000 in damages for his lung problems. In response to Civil Action #683 (Name deleted), the A.E.C., Carbon and Carbide Chemicals Corporation, and the Justice Department sought to keep the case from appearing in Federal District Court.[7]

The employee had been a crane operator working in Carbon and Carbide Corporation's vacuum pump shop, picking up machines with the crane, and dropping them into a cleaning solution. He worked at the shop for several months in 1945, until he was admitted to the infirmary for bronchopneumonia and pleurisy. He was unable to work afterward, and claimed in his lawsuit that he was "totally disabled and ... unable to work at any gainful occupation." He "claimed that his condition had been caused by his breathing fumes and dust from over the Vacuum Pump Shop."[8]

The claim was initially rejected by Carbide, claiming that "the only possibility of exposure to the claimant would be from ... oil which has a chlorine base. He had suffered no damage from any such exposure." However, later investigation revealed that "the claimant might have been exposed to trichlorothylene fumes, archlor oil fumes which may have been contaminated with a residue of uranium salts from process and silicon and magnesium dust or asbestos dust."[9] The shop in which the man worked had poor ventilation, and tended to "hold fumes or dust in the area." An industrial hygiene report covering this period noted that the area was contaminated with "archlor, fluorocarbons, trichlorothylene. The hot metals dropped into archlor oil "will generate phosgene, hydrochloride fumes, and hydrochloric acid." Though the AEC still would not admit that these conditions caused the lung condition, a member of the Medical Section noted, "Inhalation of fumes by a patient with asthma often markedly aggravates his condition."[10]

The AEC decided to settle the case rather than risk a breach of security, or a discussion of working conditions, in open court. The Occupational Disease Claims Advisory Board suggested settling the case as "it would be practically impossible to defend this case since the facts show a violation of the Tennessee Statute of Ventilation." Not only were the working conditions indefensible, but, "Major Brundage of the Medical Section is quite sure that medical testimony would show aggravation of [the man's] condition on

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[7]United States Atomic Energy Commission. ORAU 1433. Insurance, 1946 Folder. Public Reading Room, Oak Ridge Operations Office.

[8]United States Atomic Energy Commission. ORAU 1433. Insurance, 1946 Folder. Public Reading Room, Oak Ridge Operations Office.

[9]United States Atomic Energy Commission. Collection: ORAU 1433. Insurance, 1946 Folder. Public Reading Room, Oak Ridge Operations Office.

[10]United States Atomic Energy Commission. ORAU 1433. Insurance, 1946 Folder. Public Reading Room, Oak Ridge Operations Office.

account of the gases, fumes and dust to which [he] was exposed."[11] This case demonstrates the extent to which the AEC sought to avoid court when clearly at fault for injury. Though the AEC admitted that it was breaking Tennessee's ventilation code and that this could have caused the worker's lung problems, it would not admit its own culpability in the matter.

If at all possible, the MED and AEC sought to keep cases out of court by not telling workers that they had been exposed to radiation. One such worker, a woman at Tennessee Eastman from 1943 to 1945, cleaned "D" units as they came from the tracks as part of chemical recovery.[12] This woman worked with "warm" (radioactive) units that emitted uranium, and HCl and Cl fumes. Project officials noted that this was "a case of [kidney] nephritis" and "it appears with some degree of probability that the disease was occasioned by exposure." The woman, as of 1945, was "unaware of her condition, which now shows up on routine physical check and analysis." The Aec knew this was not likely to be an isolated case. "Medical officers anticipate that we will have continued cases of this character." Those affected would suffer "permanent impairment of kidney functions."[13] However, this permanent impairment did not lead the MED to offer anything by way of compensation; instead, the victim was left in the dark about her condition.

Human Radiation Experiments at Oak Ridge

The human radiation experiments revealed by Energy Secretary Hazel O'Leary in 1993 had been part of America's atomic energy program since the Manhattan Project. At Oak Ridge, the idea of subjecting humans to experiments involving uranium and plutonium originated with concerns about the health effects of these substances. Human radiation experiments were not, therefore, an isolated part of the AEC's medical and biological research program. Instead, issues of human experimentation originated in the workplace, as part of an attempt to set correct exposure levels for Manhattan Project personnel.

Paradoxically, proposals for human radiation experiments originated out of concern for setting safe levels of occupational exposure to new substances, such as plutonium. Concern about health and safety hazards went hand in hand with the desire to experiment on humans. Berkeley chemist Glenn Seaborg, a discoverer of plutonium, wrote to Dr. Robert Stone on January 5, 1944, "It has occurred to me that the physiological hazards of working with plutonium and its compounds may be very great. Due to its alpha radiation and long life it may be that the permanent location in the body of even very small amounts, say one milligram or less, may be very harmful. ... I would like to suggest a program to trace the course of plutonium through the body initiated as soon as possible."[14] Thus, Seaborg was both a concerned scientist, interested in protecting workers from plutonium, and a scientist interested in learning about the course of plutonium in the human body.

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[11]United States Atomic Energy Commission. ORAU 1433. Insurance, 1946 Folder. Public Reading Room, Oak Ridge Operations Office.

[12]United States Atomic Energy Commission. Close to Taney, 25 July 1945, OROO 1178. Public Reading Room, Oak Ridge Operations Office.

[13]United States Atomic Energy Commission. Close to Taney, 25 July 1945, OROO 1178. Public Reading Room, Oak Ridge Operations Office

[14]President's Advisory Committee on Human Radiation Experiments (New York: Oxford University Press, 1996), Chapter 5.

Accidental exposures of workers and chemists to plutonium and uranium became the first human radiation experiments of the Manhattan Project. In August 1944, a chemist at Los Alamos ingested plutonium during a small nuclear explosion at the laboratory. His stomach was pumped and analyzed for data on plutonium absorption. By March 1945, officials at Los Alamos noted abnormal urine samples and blood counts among workers, indicating harmful radiation exposure was taking place at the lab. Louis Hempelman of Los Alamos decided that this situation called for a program of "human tracer experiments" at Oak Ridge, Rochester and Chicago to "determine the percentage of plutonium excreted in the urine and the feces."[15] This was done in full knowledge of the cancer and other risks involved.[16]

All that was needed for this plutonium experiment was a subject. Oak Ridge was a natural source of personnel for such experiments. On April 10, 1945, Ebb Cade, a 53 year-old black construction worker in Oak Ridge hospital, who was recuperating from an auto accident, was injected with 5 micrograms of plutonium by Army physicians. Bone samples were taken and teeth extracted (15 teeth total) during the course of his stay in the hospital. Cade was never asked for his consent for any procedure, nor told that he was the subject of an experiment. The results of the experiment were worthless; no kidney baseline data had been taken, and before and after urine specimens were commingled. Cade left the hospital and returned home before any further follow up experiments could be done. Though Cade's testing was botched, the MED continued radiation experiments on Oak Ridge workers.

During the Manhattan Project, officials in Health Physics at Oak Ridge conducted human experiments to determine the harmfulness of uranium exposure to workers. The Department of Energy described the experiment as follows: "Two male volunteer workers at the Y-12 plant were deliberately overexposed to high concentrations of airborne uranium oxide dust. The operator attempted to make the air more dusty than would otherwise be normal. The subjects inhaled the air for 30 minutes." These men were then monitored, and urine samples were taken to determine the excretion of uranium from the body. The rest of the workers in section, 168 in number, men and women, were simply monitored for "routine occupational exposure to uranium at their work place." These experiments were designed to test the ways in which the body disposes of uranium oxide dust. If the vast majority of inhaled and ingested uranium was excreted by workers quickly, this would suggest that exposure to these dusts was not harmful.

These experiments blur the line between "experimentation" and "production." Workers at Oak Ridge, purposely exposed to levels of radiation known to be harmful by the MED, were all experimental subjects. It is unclear from existing records what information they were given about the dangerousness of their undertaking, or whether they gave their consent under pressure from their employer.

Postwar Radiation Experiments

The end of the war and transition to a civilian AEC did not end human radiation experiments on workers at Oak Ridge. Neither did a 194x GM bulletin making clear the need for informed consent of all experimental subjects. Instead, records show that when the opportunity presented itself, workers would be used as subjects. In 1949, when Oak Ridge was chosen to machine high-concentration uranium metals (code named Sunflower and Daffodil) Oak Ridge Health Physics officials decided that these two projects presented an opportunity for research. Health Physics proposed to measure radiation exposure and effects "of machinists and operators in the Sunflower and Daffodil programs for the next

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[15]Ibid.

[16]Ibid.

two years." This study would "establish clearly that measurable physiological injury either does, or does not occur, as a result of long term, minimal exposure."[17]

The Sunflower and Daffodil studies were needed because:

> It was definitely established that some uranium is absorbed [in production of high-concentration material] in spite of precautions taken against it. That is, complete protection is not afforded by elaborate ventilation facilities and respiratory protective devices. Now a further effort to obtain higher concentrations is being planned. And it is this project to which the proposed study has reference. Only one or two subjects are involved in the study, and, in view of the potential benefits to personnel in this plant and others which may result, it is felt that full advantage should be taken of this opportunity.[18]

Two workers would serve as subjects, and would be hospitalized for kidney function tests to determine "abnormal physiological conditions in the kidneys." These workers were exposed to radiation as part of their job, and would carry with them dummy respirators, which would simulate breathing and measure how much uranium was trapped in the respirator filter, and how much made it through. Urine and stool samples would be monitored to track the amount of uranium being excreted.[19]

The official justification of the testing was to learn what measures, if any, should be taken to protect workers:

> During the past year, a rather intensive effort has been put forth by the Health Physics Department and Chemical Division to identify the hazardous conditions ... and to correct them. About all that can be done has been done, short of installing elaborate and probably unnecessary local ventilation facilities. ... effective as these improvement appear to be, present measurements continue to indicate the possibility of minimal exposure via contaminated air, hands, clothing, etc. This fact has led to the thought that additional protection is needed by these employees, over and above what is presently afforded.[20]

However, if the working conditions in the machining section at Oak Ridge had been corrected to eliminate worker exposure to hazardous substances, these exposure tests would have been unnecessary. It was the danger of the working environment that directly led to the testing.

At the suggestion of Harold Hodge at the University of Rochester, local hospitals and dental clinics would be notified to turn over extracted tissue from workers to the AEC for analysis. Hodge asked that "furthermore, arrangements should be made to secure

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[17]United States Atomic Energy Commission. Struxness to Larson, June 14, 1949, Public Reading Room, Oak Ridge Operations Office.

[18]United States Atomic Energy Commission. Struxness to Larson, June 14, 1949, Public Reading Room, Oak Ridge Operations Office.

[19]United States Atomic Energy Commission. Struxness to Larson, June 14, 1949, Public Reading Room, Oak Ridge Operations Office.

[20]United States Atomic Energy Commission. Struxness to Larson, June 14, 1949, Public Reading Room, Oak Ridge Operations Office.

samples of hard tissue, i.e., rib, sternum, vertebra and femur, on post-mortem examinations when such an opportunity is presented."[21]

The exposure of workers to radiation beyond what was believed safe was the reason behind human radiation experimentation at Oak Ridge. The record of human radiation experimentation at Oak Ridge demonstrates the direct relationship between occupational exposure of workers to radiation and the experimentation to understand the effects of radioactive substances on the human body. Human radiation experiments at Oak Ridge were a violation of workers' human rights both as workers and as experimental subjects. In neither role did workers receive sufficient information to give informed consent to the levels of radiation they were exposed to, and in neither case were they asked for their consent.

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[21]United States Atomic Energy Commission. Struxness to Larson, June 14, 1949, Public Reading Room, Oak Ridge Operations Office.

The Manhattan Project is an archtypical example of a technological and social system built from above. Conceived of by scientists, supported by politicians and administrators, the Project was the closest America came to the great Stalinist projects of Soviet industrialization. Viewed from the top down, the Project is a marvel of efficiency, scientific daring and engineering power. However, this evaluation shifts when one looks at the project from the bottom up, from the point of view of the workers that built and ran the machines at sites such as Oak Ridge. In this dissertation I have examined workers' resistance to Manhattan Project policies as well as their complicity, the activism of workers who organized unions at Oak Ridge World War II, and the limits to their attacks on corporate and government authority.

In 1942, when General Groves placed his finger on the map and created Oak Ridge, he could not possibly have forseen the ultimate ramifications of his decisions. For while Groves sought to build a factory city that he could control, that city would escape his control within a few short years. Oak Ridge was torn from the Army's grasp by a number of factors internal to and external to its residents.

The recruitment strategy that the Manhattan Project used to bring workers to the project site, offers of good housing, steady work, and high wages, backfired when workers came to view these promises as rights of citizenship. The compartmentalized structure of work at Oak Ridge created an isolated and alienated work force with little idea of what it produced, and these workers were kept in line by the vast security network at Oak Ridge.

These grievances were also kept in check during the war by both the genuine patriotism and the persuasive propaganda generated by World War II. However, there is evidence that workers did not entirely buy into this ideologyof total wartime sacrifice. Throughout the war, when presented with intolerable working conditions or longstanding grievances, workers at Oak Ridge walked off the job. Though these walkouts never shut the project down entirely, they stand out as assertions of workers' and foreshadow post war organizing efforts.

With the dropping of the atomic bomb at Hiroshima and the end of World War II, Oak Ridge entered a new era. Within a year, labor unions began organizing workers, making issues of working conditions and the military's control of the community. Workers who had come to Oak Ridge for temporary work, or those laid off during reductions of the workforce at the plants, left the city at the close of hostilities. Those who remained had made a choice to make Oak Ridge their permanent home, and transforming Oak Ridge from an Army town to a community where workers expected full citizenshiip rights. With a stake in the future of Oak Ridge, residents began to demand civil and political rights that had been denied them during the war years.

During the war, the Manhattan Project barred union organizing in the plants at Oak Ridge, and national unions voluntarily agreed to delay unionization there. But in 1945 workers at Oak Ridge began organizing without the permission of their national unions. In 1946, the War Department decision to allow union elections at Oak Ridge opened the floodgates of labor activism. The subsequent AFL and CIO organizing drives helped carve a new "civil society" in Oak Ridge, out of what had been a wartime military outpost. The union representation election victories in 1946 led to the formation of the United Chemical Workers and Atomic Trades and Labor Council; These unions were able to win basic rights for many Oak Ridge's workers. Workers could no longer be terminated at the will of the employer and replaced with less experienced workers and wages were increased to keep up with high post-war inflation.

However, external events once again intervened in Oak Ridge's history. The transfer of the site from Army to Atomic Energy Commission control did little to change the situation of workers there: the wartime anti-union policy was continued. The passage of the Taft-Hartley Act (NLRA) in 1947 meant that workers in areas necessary to "national

security" could be barred by the President and the Federal judiciary from striking for 80 days at a time. In addition, the new "Cold War" meant that new restrictions on political dissent were imposed on workers and their representatives, making any radical political activity dangerous for workers or union leaders. Within Oak Ridge,workers were divided two unions, one plant AFL and the other CIO, meant that workers lacked a unified voice when dealing with the corporations or the AEC.

Oak Ridge's new unions negotiated their first contracts under these constraints. Though they won increased wages and benefits the AEC's contractors, they did not gain the power in the workplace that they had sought. Instead, the AEC and the plant's management held onto a monopoly of the "Right to manage." This stalemate meant that workers never played a significant role in shaping working conditions and safety policy.

The plants and laboratories at Oak Ridge had been using radioactive and highly dangerous substances since the Second World War, without informing workers of the hazards of employment. Shielded by official powers of classification, the corporations that ran the plants at Oak Ridge and the AEC did not let workers know that they were exposed to hazardous levels of radiation, mercury and fluorine. Instead, workers at Oak Ridge were assured that their workplace was safe, and that there was no need for worker concerns over health and safety issues.

These decisions had long term ramifications for Oak Ridge's workers. Epidemiological studies have shown that blue-collar workers at Oak Ridge have faced (and face) a higher cancer risk than white-collar because of their daily contact with radiation and other carcinogens in the plants. The Oak Ridge environment has been the site of massive dumping of radioactive and chemical waste, some of which has found its way into the neighboring community and water supply.

Today, on the road into Oak Ridge, a billboard reads, "Oak Ridge: America's Secret City." Created during World War II, the legacy of wartime secrecy continues to this day, affecting both researchers' and residents' attempts to learn the truth about what has gone on at the facilities. The past at Oak Ridge is still, in large part, a yet unopened file, as workers, citizens and researchers continue to press for this secret history to become known.

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