



Technological Change *before* Globalization

Race and Declining Employment for Mexicans on Railroads, 1945-1970

Michael Calderon-Zaks

University of California, San Diego

m2calderonzaks@ucsd.edu

Abstract

Though the world-systems school has argued that globalization has been a long process over the last five centuries, globalization is often only synonymous with the late twentieth century. Globalization has gained a lot of attention in the context of declining blue-collar job sectors, but the technologies that enabled it had already displaced workers on U.S. railroads. To bridge both schools, railroads are the perfect setting for this study since it's at the intersection of race, labor, technological changes, and globalization. Mexicans once accounted for ninety percent of track workers in the U.S. Southwest, but after gaining higher wages by the early 1950s, most of their jobs were lost to automation by the 1960s. While faster and larger cargo ships and railroads in recent decades have been synonymous with globalization, the technologies and infrastructure didn't enable that global process until the 1970s at the earliest. Technological changes eliminated more jobs on the tracks before 1970 than to globalization since. Globalization was not possible without those technological changes.

Keywords: Automation, Railroads, Employment, Race, Globalization



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This article is a case study in job losses by way of technological changes that preceded and paved the way for the era of globalization since 1970. World-Systems Theory has contributed greatly to our understandings of time and space, acknowledging the role of cheaper/faster transport in the world-system (Wallerstein 2004; Sowers, Ciccantell, and Smith 2017; Ciccantell and Bunker 2002; Ciccantell and Smith 2009); and has scratched the surface on railroads (Ciccantell and Bunker 2005; Abu-Lughod 1999; Arrighi 1999; Meinig 1998; Montejano 1987). The increased speed and automation on railroads in the 1950s cost its workers their jobs by the 1960s, as this article will demonstrate. This could be viewed as an episode of what David Harvey called the “accumulation by dispossession” via “induced unemployment” (2003: 153) in that labor became expendable to make capital more mobile and vice versa (Sassen 1990). Moreover, Karl Benedikt Frey’s (2019) honest history of automation and its displacements offers an opportunity to center technological changes in discussions on enlarged social stratification in the core. This is an important intervention against prevailing perspectives focusing on globalization and, to a lesser degree, immigration (Wilson 2017; Steinberg 2006; 2005). Moreover, globalization (especially the mobility of capital) wasn’t possible without the technological changes that preceded it, especially in transportation.

The experiences of Mexicans and African Americans who worked the railroads through the 1950s more closely resemble Frey’s point about automation. His point is not new, but other perspectives have obscured it. By ignoring automation, even when not factoring in its racialized outcomes, racist narratives linking Latinx immigration or Asian sweatshop laborers undermining employment opportunities in the United States remain more durable, as noted by Edna Bonacich, Sabrima Alimahomed, and Jake Wilson (2008). Moreover, the postwar era pre-globalization included technological changes that displaced Black and Brown workers disproportionately.

While William Julius Wilson argued that economic restructuring made Black and other racial minority labor expendable, his starting point was in the 1970s with the “expansion of industrial technology and thereby an increase in the number of workers victimized by technological employment” (Wilson 1978). It was by then, however, that most Mexicans and African Americans on railroads had already lost their jobs. Ironically, Wilson argued that race was merely accidental in the economic restructuring process and was therefore declining in significance, despite evidence that the sectors with more racial minorities were more decimated than sectors dominated by whites. Railroads as a major source of employment for people of color declined during an economic boom—two decades *before* Wilson’s controversial thesis. James Boggs’ notes in 1963 alone contradict Wilson, revealing that automation had already been implemented in American industries, including railroads and, in particular, the auto industry he himself worked in (1963). Between 1952 and 1962, over 58 percent of railroad maintenance of way employees lost their jobs due to technological changes (Richter 1964). By 1966, 84 percent of Mexican workers on the railroads, mostly maintaining the tracks, lost their jobs (*Bureau of Labor Statistics* 1972).

That Mexican Americans and African Americans were among the victims of early economic restructuring in the early postwar era is probably why they were barely mentioned, until later in the twentieth century. The attention Latinx people receive in the context of economic restructuring

is largely limited to late twentieth and early twenty-first century immigration and the labor context within that focuses on jobs they arrive to work in (Sassen 1990; Stuesse 2016; Zambrana 2011; Mohl 2009). Earlier in the era of globalization and economic restructuring, there were few studies of the adverse effects on Latinx workers focused on the late twentieth century (Chapa 1998; Gonzalez 1993; Melendez 1998; Morales 1998; Rodriguez 1993; Sassen 1990). Mostly ignored were the elimination of jobs via technological change, especially on railroads. Technological change is what enabled economic restructuring, a process commonly recognized as either deindustrialization, globalization, or both—they're not mutually exclusive.

In the early twentieth century, railroads were a significant source of employment for Mexicans. Jeffrey Garcilazo (2012) covers the period from 1900 to 1930, Barbara Driscoll (1999) and Erasmo Gamboa (2016) cover the prelude to World War II and the Bracero railroad experiences. Technological changes in the railroad industry eliminated their jobs long before the 1970s technological revolution that prompted Wilson to declare that race was becoming secondary in employment structures. If anything, the heavy automation that began in the mid-1950s (if not sooner) could be described as a process of racism without racists (Bonilla-Silva 2010) since there was no proven racist intent but the empirical data reveals a racialized outcome. Thus, this article examines an early example of racial minorities being among the first victims of an economic restructuring process based on technological changes and the last to recover, while receiving inattention.

While much of the attention on job losses in communities of color focuses on the end of the twentieth century with the offshoring of industries, this article focuses on the railroads during a period of economic restructuring. While railroads were losing importance to the construction of Interstate Highways and air travel, which in themselves represent technological changes, the rail industry mechanized the track maintenance operations, also known as the “maintenance of way,” reducing the need for laborers. Interstate highway construction made both railroads less vital to metropolitan economies and re-centered production and retail to the suburbs (National Commission on Productivity and Council of Economic Advisers 1973). Railroads then had to be reorganized in order to become relevant again. Their reorganization meant bolstering their transcontinental lines, while, ironically, also downsizing their maintenance of way gangs—the division of labor responsible for maintaining the tracks, which, historically, was racialized. Maintenance of way gangs in the South were predominantly African-American, and in the Southwest, Mexicans (Arnessen 2001). The technological changes centered around the handling of cargo containers made railroads more important to long-distance overland freight transport. Though the mechanization of ports also led to the elimination of jobs, this paper focuses on railroads, despite the two questions relating to each other. In both contexts, automation eliminated the need for laborers more than globalization—much of the damage came *before* globalization associated with the late twentieth century. All employment trends in the railroad industry depended on technological changes, as did globalization, itself. Technological change is thus the independent variable.

The first section provides historical context for the paper, including how maintenance of way work became racialized until World War II, and where Mexicans entered the picture. Though Mexicans don't make for a global diaspora, there is a global context for the role Mexicans played in the maintenance of railroads in the United States: building and maintaining the Southern Pacific as it linked the Pacific Ocean to the Gulf of Mexico, including the global port cities of San Francisco, Los Angeles, and New Orleans; more Mexicans were recruited to maintain track during both world wars, aiding the war supply chain.

The second section explains the technologies involved in the process that made Mexican laborers expendable. The technologies of maintaining railroads had actually advanced to minimize the need for laborers as early as the late 1910s but the railroad companies chose not to purchase mechanical maintenance equipment until wages increased as a percentage of operating costs after World War II. It's important to note that wages increased as a result of greater unionization in the early 1950s, and the rail companies' investment in automation responded to the success of the Congress of Industrial Organizations competing against the Brotherhood of Maintenance of Way Employes [sic]¹(BMWE). It's important to intersect the improved status of maintenance of way employment in the early 1950s, as the BMWE sought to maintain its gains by demanding the deportation of undocumented Mexican workers, to which the Immigration and Naturalization Service (INS) responded with mass deportations of Mexicans who worked on railroads than other industries, while initially ignoring the much greater threat of automation on the durability of rail employment. The other major technological change was in the form of Interstate Highways, which made the railroad industry less relevant to urban economies. By the time cargo containers were designed to be moved by cranes at ports and railroad depots that enabled globalization, the vast majority of jobs maintaining railroads were already lost.

The third section notes the ironies of globalization—that it depended on long-distance railroads, yet the benefits of increased global trade were already nullified by the automation of the maintenance of way, making its laborers obsolete, either way. Nevertheless, from the laborers' perspective, eliminating their labor only led to more railroad derailments. Only by the late 1970s did suburban factories close, coinciding with globalization, and affecting more white workers. To racialized minorities, however, the damage had been long done.

Historical Context

The first railroads in the United States were built in Maryland in the 1830s (Stover 1997; Stover 1987), before spreading to other parts of the United States (Meinig 1993; Montejano 1987; Aldrich 2006; Licht 1983). It didn't take long for rail building and maintenance of way to become dangerous, from building through mountains and over gorges. Laying and maintaining railroad tracks as of 1901 was statistically the most dangerous occupation in the United States (U.S.

¹ "Employes" was the correct spelling through the early twentieth century and spelled this way formally by the Brotherhood of Maintenance of Way Employes (BMWE) even today (<https://www.bmwe.org>)

Congress 1901). Thus, historically maintenance of way work was performed differently by each region's most racialized groups at that time. The Irish worked the maintenance of way in the north before yielding to eastern and southern Europeans by the 1910s (Hungerford 1917) and African Americans by the 1920s. African Americans already built and maintained the southern railroads as enslaved workers before the Civil War and as convict lessees after it (Lichtenstein 1996; Adamson 1983; Arnessen 2001; 1997; DuBois 1998). The Chinese predominated in the western states from the 1860s to the 1880s (Chang 2019; Fisher Fishkin 2019) before yielding to Japanese, Greeks, and Italians (Arnessen 2001). Though the earliest Mexicans on American railroads helped build the Southern Pacific Railroad along with the Chinese from San Francisco to Los Angeles and then eastward towards El Paso (Camarillo 1996; Park 1961), Mexican laborers became the majority of the southwest track crews by the 1920s (Garcilazo 2012; Taylor 1930). Racial changes in the division of labor were noticeable by the 1910s. Mexicans were dominant by the middle of that decade in the Southwest, while in other western states Japanese had replaced Chinese workers, and southern Europeans having replaced the Irish in the Northeast. African Americans remained the dominant workforce east of the Mississippi and south of the Ohio rivers (Hungerford 1917).

In the late nineteenth and early twentieth century, railroad companies offered Mexicans rail passes to freely ride the railroads to the United States expecting them to labor on them, only for some to deviate into higher paying sites of employment, including rival railroads (Cardoso 1980; Clark 1909). Mexican labor on railroads was almost exclusively on the tracks. Those on railroads were often there due to job discrimination in higher-paying occupations. For example, Guadalupe Salas Villareal, who worked in multiple occupations, including railroad and steel work, recalled that Mexicans working on the railroad maintenance of way were not prevented by whites from working there, but that Mexicans working in steel were contested by them (Corwin 1978). Railroads paid Mexicans on the maintenance of less than other racial groups (Clark 1908; U.S. Senate 1911), in addition to Arizona railroads having a dual-wage system.² The peak decade for maintenance of way employment was the 1920s, with the high-point being 1926. Between 1926 and 1929, there were well over 400,000 maintenance of way workers nationwide (Haber and Kahn 1957). The Great Depression led to mass layoffs throughout the industry, especially on the maintenance of way as railroads consolidated their lines (Haber and Kahn 1957). Even during the Depression, the only evidence of Mexicans displaced from railroad work by white workers is in the Midwest (*Los Angeles Times* 1931).

During World War II, the railroad companies relied on Mexican contract laborers by way of the Bracero Program, which was lobbied for heavily by the Southern Pacific Railroad (Driscoll 1999). SP became the largest employer of Braceros with well over ten thousand. A distant second

² "Wage Data Collected on the Santa Fe in Arizona, December 1921." National Archives and Records Administration, RG 13, ARC 1633895, Box 5, Entry A1 61, p. 4; US Railroad Board Statistical Bureau. "Statement Showing Increases Granted by the San Diego and Arizona Railway Since July 1, 1920." RG 13 (National Mediation Board), Railroad Labor Board, Box 12, Entry 44, PI 479. NARA, College Park, MD; Abstract: Article III, Sheet 2, Line 3. Wage Data Collected, San Diego and Arizona, December 1921. William Wilson, SP Superintendent, Tucson, to C.P. Carrithers, Secretary, US Railroad Board, February 21, 1922. RG 13, Box 5, ARC 1633895, Entry A1 61. NARA, College Park, MD.

was the Santa Fe Railroad with seven thousand. Braceros were employed on American railroads from the Southwest and Northwest (Gamboa 2016) to New England and Florida (Driscoll 1999). When the war ended, Braceros were returned to Mexico, though some returned to the US to labor on rails (Driscoll 1999; Gamboa 2016). Some Mexican Americans had already worked with Braceros on the rails (Blait 1944). Once the war was over and defense plants shut, railroads remained an option for those who previously worked the maintenance of way to return to that sector of employment (Reese 1946), including many Mexican Americans. Both Mexican immigrants and Mexican Americans worked the maintenance of way into the 1970s. A Congressional Report noted in 1972 briefly recognized the discrimination in the rail industry that the federal government condoned: “The (Interstate Commerce Commission) provides favorable rates to railroads that refuse to hire Mexican Americans at any but track repair level positions” (U.S. Congress 1972: 67).

The Congress of Industrial Organizations (CIO) began a campaign to organize the workers on railroads in 1943 in response to the Bracero Program that exploited Mexican nationals (*Chicago Defender* 1944; Hogans 1944; *Pittsburgh Courier* 1944; *San Bernardino Sun* 1943). By the end of the 1940s, wages and work conditions on the maintenance of way of railroads improved in what traditionally was considered the most dangerous and worst paid railroad division of labor. The gains, however, were short-lived for many, as this article will demonstrate.

Varied Readiness of Technologies

Railroad construction to the Southwest in the late nineteenth century displaced Mexicans and Native Americans from their land in the U.S. Southwest (McWilliams 1948) and displaced indigenous people and rural peasants in Mexico (Cardoso 1980; Gonzalez and Fernandez 2003; Hart 2002), but birthed industries demanding Mexican labor over time, to labor on railroads, mines and agriculture (Clark 1908). The trans-Sonora trade of Mexican muleteers stationed in Tucson was displaced by the Southern Pacific Railroad in 1880 (McWilliams 1948; Meeks 2007).

For at least the first one hundred years of the existence of railroads, armies of labor were necessary to build them and maintain them. The technology to reduce the labor intensity of railroad maintenance wasn't around until the late 1910s at the earliest. *Railway Age Gazette* editorialized in 1917 that “labor-saving equipment should be employed to replace men wherever possible” (*Railway Age Gazette* 1917: 1314). Among the technologies available as of 1923 include pesticides for killing weeds on the ballast, the pneumatic tie tamper, and power shovels, ditchers and cranes (*Railway Age Gazette* 1923: 516). Despite the available technologies, the railroad companies delayed major investments in them for decades while the maintenance of way workforce peaked in the latter half of the 1920s (see Table 1). Towards the entry into World War II, there was an increased demand for labor that was partially filled by the mechanization of some maintenance of way tasks that eliminated the need for extra gangs (*Monthly Labor Review* 1943). Though the average rail weighed 92.72 pounds per yard in 1935, heavier ones were laid by 1941, increasing their weight to 95.95 pounds per yard, which were more durable (*Monthly Labor Review* 1943:

449). Though the railroads added laborers to the maintenance of way during the war, what really foretold the future was the increased mechanization of track-related tasks (Railway Engineering and Maintenance 1944: 246).

Table 1. Maintenance of Way Employment over Time

Year	Number	Percent of Total Railroad Jobs	Hourly Earnings
1922	365082	22.40	0.395
1927	416680	24.00	0.413
1930	343474	23.10	0.427
1933	199782	20.60	0.384
1937	228846	20.50	0.445
1938	186440	19.90	0.476
1940	205182	20.00	0.483
1945	292532	20.60	0.683
1946	256748	18.90	0.863
1947	255416	18.90	0.925
1948	256060	19.30	1.046
1949	224067	18.80	1.159
1950	226994	18.60	1.309
1951	237944	18.70	1.476
1953	225430	18.70	1.592
1957	170766	17.30	
1967	90462	14.80	

Sources: Hertel (1955: 285-287); Bureau of Labor Statistics (1972: 49)

As demonstrated in Table 2, mechanization of railroad tasks had a disproportionate effect on the maintenance of way. Through World War II most maintenance of way tasks were performed with antiquated tools like picks and shovels; railroad companies purchased power tools to offset rising labor costs in the late 1950s, including single use machines for spiking, ballasting, and hoisting and positioning ties and rails, before introducing machines that could combine those tasks. Like the heavier rails, concrete ties also proved more durable than the wooden ones previously in use and required less long-term maintenance. The mechanization of maintenance of way tasks ranged between 20 percent (fencing along the right of way) and 100 percent (handling and installing welded rails) (Bureau of Labor Statistics 1972). Other railroad tasks became mechanized,

including the use of computers for centralized traffic control (CTC) for remote signaling and switching (Bureau of Labor Statistics 1972: 30-32).³

Table 2. Mexican/Spanish-Speaking Employment on Railroads

Year	Group	Total	Percent Decline since 1945	Total Maintenance of Way	Miles of Track In Use	Percent Decline	Total Railroad Manpower (2)	Percent Decline since 1947
1945	Mexican Nationals	102984					1315200 (1947)	
1957	Total Maintenance of Way	151453			345832		984800	0.251
1966	Spanish-Speaking	16458	0.84	76546	322855	0.064	624900	0.525
2019	All rail-track laying and maintenance equipment operators	5000	0.967		92282	0.733	57000	0.956

Sources: Railroad Retirement Board 1945; Bureau of Labor Statistics 1972; Bureau of Labor Statistics 2020; Bureau of Transportation Statistics

After the end of World War II, operating revenues on railroads declined, while the cost of labor and materials increased. Revenue declined as competing means of transport also increased in the form of air travel, buses, individual motoring, and trucking (Jones 1953). While interstate buses and trucks could use the highways for free, and airlines also were not responsible for maintaining air space it used, railroads had to maintain their own tracks (Brotherhood of Maintenance of Way Employees 1955). Despite the competition that the railroad industry entered, improved working conditions were still within reach.

The CIO supported the organizing efforts of its union on the railroads, URRWA and its maintenance of way arm, the Association of Maintenance of Way and Miscellaneous Employees, sought to organize Mexican nationals referred to as Braceros on the Santa Fe Railroad in 1943 (Railway Age 1945). URRWA attracted BMWWE members by offering to fight for higher wages if they would switch unions. By raising the stakes, the URRWA forced the BMWWE out of its

³ While railroad companies documented data on their Mexican employees in the first half of the twentieth century, there's been little data collected in the postwar years. Thereafter are occasional references to the "Spanish-Speaking" but not specifically Mexican.

pragmatism while also promoting equality between white and nonwhite members. This was a campaign that was aided by the National Mediation Board in 1945, when it ruled that Mexican nationals could vote in union elections. Though they at the time voted down representation by the URRWA, they would entertain the idea several years later (Hertel 1955). The URRWA won an election by 206 votes to 50 in La Junta, Colorado in 1951, while losing 5,747 to 4,909 nationwide (Brotherhood of Maintenance of Way Employes 1952). Nevertheless, the intense competition between the two unions to represent workers on the maintenance of way forced their wages upwards, as the BMWWE could no longer be merely pragmatic while the URRWA offered to fight for higher wages.

Maintenance of way employees had the highest real wage gains between 1929 and 1952, despite the railroad operating revenues in decline (Jones 1953). The number of hours worked per week on the maintenance of way over that same period *declined*, from 48.2 to 38.9 (Jones 1953). The fastest change for maintenance of way employees occurred between 1946 and 1952, with an 80 percent wage increase, 50 percent increase in annual compensation, and a reduction in hours per week from 46.8 to 38.9 (Jones 1953: 21). The minimum wage on railroads in 1940 was \$0.40 an hour, but the range during World War II was from that to \$0.65—for Braceros.⁴ By 1948, the average wage on the maintenance of way was \$1.078 and in 1949 \$1.197 per hour, though still below the rail industry average wages of \$1.263 and \$1.381, respectively (U.S. Census 1951).

The 40 hour work week only became standard in the railroad industry in 1949, much later than in other industries.⁵ Perhaps because their wages were already the lowest in the industry, maintenance of way employees enjoyed the largest wage gain of all railroad occupations between 1929 and 1952, improving by 102 percent (Jones 1953: 22). For those remaining in maintenance of way employment, their quality of life improved. As an industry, Jones argued that railroad employees' earnings increased "by a greater amount than in any other equal period of time in history" (Jones 1953: 20).

Wages rose on railroads so much that, unlike in earlier periods when Mexicans left railroad employment for agricultural work at higher wages, by the early 1950s some were fortunate enough to leave lower wages in agriculture for higher ones in railroad maintenance of way labor (Brotherhood of Maintenance of Way Employes 1952; U.S. Congress 1952). The BMWWE's research director, Frank Noakes, testified before Congress that Immigration and Naturalization Service raids targeted the railroad industry more than any other, from January to February 1952 (see Table 3). That sample remains the only data available that breaks down apprehensions by economic sector, but nevertheless reveals the significance of the Mexican presence on U.S. railroads well into the 1950s. Moreover, it was also the first-time immigration authorities policed

⁴ Railway Labor Executives' Association Records, 1926-1976, RG 5484, Box 2, Folder 13. Kheel Center for Labor-Management Documentation and Archives, Cornell University Library.

⁵ "Background Leading to Request from United Railroad Workers of America for a CIO National Union Charter," p. 3. Folder: United Railroad Workers of America: Minutes: General Executive Board, 12/10/53, 1953. Transport Workers Union Papers, WAG #235, Box 63A, Wagner Labor Archives, Tamiment Special Collections Library. New York University, New York, NY.

railroads for Mexican laborers—once working the tracks became a viable occupation. All but 33 of the 1,148 apprehended were Mexicans, with 398 of them working in railroads as the largest group, versus only 76 in agriculture, 32 in hotels and restaurants, and 14 unemployed; 574 were “illegal entrants” while 485 were “abscondee from agricultural contracts” (U.S. Congress 1952a; U.S. Congress 1952b). That data was not region-specific, but Noakes further testified that between Kansas City and Detroit, without a specific date range, 1,508 Mexicans were apprehended, with 520 of them working on railroads (U.S. Congress 1952a: 1696). There were even apprehensions of 38 Mexicans working on the Alaska Railroad in 1951 (Hadley 1956: 336).

Table 3. INS Deportations by Industry, early 1952.

Industry	January to mid-February 1952 (Geographically Unspecified)		Thirty-day Period between Mid-February to March 26, 1952 (Kansas City, Chicago, and Detroit Districts)	
	Number	Percent	Number	Percent
Railroads	398	34.66	520	33.59
Meatpacking and Processing	105	9.14	127	8.20
Steel Making and Fabrication	97	8.45	118	7.62
Agriculture	76	6.62	NA	NA
Hotels & Restaurants	32	2.78	56	3.61
Unemployed	14	1.21	NA	NA
Other Industries	426	37.10	NA	NA
Total	1148	100.00	1548	100.00
Mexicans	1115	97.12	1508	97.41
Others	33	2.88	40	2.59

Sources: U.S. Congress 1952a: 1695-1696; 1952b: 744-745, 748

Despite the presence of undocumented workers on the railroads, the perception that they lowered wages or undermined unions has evidence to the contrary, as even the Immigration and Naturalization Service Commissioner Argyle Mackey admitted to Congress that “most of these people are union members and have union cards...but we are trying to get the assistance of the unions to not admit them to membership” (U.S. Congress 1952b: 745). That immigration officials

finally policed railroads while largely ignoring agriculture reflected the changing status of railroad work—it was finally an occupation that white workers sought to protect. Despite that maintenance of way had become viable work, even if multiplied by apprehension data in other regions, technological change was a larger threat to those jobs than immigration, let alone globalization that was not yet a realistic possibility for another two decades, at least. Unions ignored the threat to automation throughout the 1950s—instead, a survey of Bureau of Labor Statistics includes some unions actively supporting mechanization, reasoning that it would make their tasks easier, instead of resisting it (Frey 2019). Boggs (1963) noted, however, that workers were very concerned about the threat of automation to their jobs, which was not limited to railroads, but that unions had deferred to capital’s choice of production tools in exchange for wage gains and other benefits.

As wages rose, so did job terminations as a response to those wage gains (Jones 1953). The difference between 1948 and 1949 alone had a scissor effect—wage gains countered by fewer jobs. Railroad companies terminated over thirty thousand maintenance of way workers, having employed 272,335 in 1948 but only 240,504 the following year in 1949 (U.S. Census 1951). Railroad labor expenditures on the maintenance of way were 4.6 percent less in 1949 than in 1948, but capital expenditures for equipment increased 6.5 percent (943). The BMW’s 1955 convention addressed the immediate effect after the 1952 wage gains. From 1953 to 1954, maintenance of way employment fell over forty-thousand jobs, which it attributed to being “displaced by machines” (Brotherhood of Maintenance of Way Employes 1955: 165). William Haber, an economist at the University of Michigan, was invited by the BMW to assess the role of automation in shrinking employment on the maintenance of way. In his address to the BMW convention in 1956, Haber was the bearer of bad news, reminding members that the losses in jobs on the maintenance of way were “permanent,” and “the forces which create the loss are relentless...overwhelming” (Haber 1956: 8), with a loss of 556 jobs per month between 1946-1952 (a total of 38,000). Between 1952 and 1955, 48,890 more jobs were lost over half the time of the previous period. In order of importance, he cited the following forces eating away maintenance of way jobs: mechanization, better materials, new organization of work, and central traffic control (Haber 1956).

Mechanization didn’t just eliminate jobs, it required more skill in the remaining jobs it provided, from the “pick and shovel jobs into a machine operator’s job” (Haber 1956: 11). With automation more mileage was covered per crew, removing maintenance of way workers further from their families for prolonged periods (Haber 1956). The maintenance of way work remained seasonal well into the 1950s, more than any other railroad classification (Haber 1956).

Haber and his colleagues (Haber and Kahn 1957; Haber et al 1957) concluded that the then-recent layoffs, other than a major expansion during World War II, were actually part of a longer-term trend—“cut in half during the past three decades” with the most important causes being “technological change and inter-industry competition” (Haber et al. 1957: 3). New jobs as machine operators were created at the expense of displacing more laborers. Though technological changes and competition from other means of transportation adversely affected most railroad occupations, none was harder hit than the maintenance of way (Haber et al. 1957). The year 1929 was the peak

employment year for all railroad occupations except for Masons and Portable Equipment Operators, whose employment in 1955 were 115.8 and 226 percent, respectively, of their 1929 employment. By contrast, maintenance of way laborers (other than gardeners and farmers) were employed in 1955 only 29 percent of their 1929 levels—40 percent for section men and 42.8 percent for extra gang men (Haber et al. 1957). The BMW nor Haber ever mentioned which racial groups were disproportionately affected by technological changes and competition from emerging modes of transport. One estimate noted that five men operating machines could do the work of seventy five men working the tracks with antiquated picks and shovels, with the new operators drawn from a “somewhat different stratum of society than their predecessors” with mechanical training in urban centers (Cottrell 1970: 125). Moreover, Fred Cottrell notes, the “minority status” of the maintenance of way workers historically prevented them from developing enough political power to control who worked there (Cottrell 1970: 123-125).

One technological change with unintended consequences, however, was the implementation of heavier trains, which only added more pressure on the tracks and trackbeds, while railroad maintenance budgets declined in the 1950s and 1960s (Aldrich 2018), though they did invest in “potentially dangerous technologies” in the form of track maintenance machines (Aldrich 2018).

Depending on how efficiency was defined, it can be argued that the automation of track maintenance was only efficient for the railroad companies who maintained their own rails, but not the shippers or workers. Neglected maintenance led to an increase in derailments, and thus lost cargo. The railroad industry paid \$98 million, or 1.1% of its freight revenue, to loss and damage claims in 1955, and by 1971 rose to \$235 million, or two percent, respectively (National Commission on Productivity and Council of Economic Advisers 1973).

Undermining Gains of Labor and Civil Rights Movements

Buoyed by the civil rights movement at the time, Mexican Americans pushed against discrimination in promotions. One such promotion was as engineers of steam engines—as they were being phased out in favor of diesels (Gomez-Quiñones 1994), a process that began in the early 1950s.⁶ Dieselization was complete by 1958 (Bureau of Labor Statistics 1972). Such an illusory promotion did nothing to offset job losses in the maintenance of way sector, which Mexican railroad employment was mainly limited to through the 1970s (U.S. Congress 1972). Jobs would continue to disappear into the 1960s due to the mechanization of track work, though Mexicans were not the only maintenance of way workers affected. The railroad executives noted the one area of economic growth in the industry was in long-distance freight transport as cargo containers and their handling machines became a new technological breakthrough, but not until after 1970. Since then, Sowers, Ciccantell, and Smith (2017) have confirmed those changes in the

⁶ Transcribed interview, Arthur Cota Bravo, Sr., April 16, 1984. “Tucson Railroaders,” Arizona Historical Society, Tucson, AZ, AV 0001-04, p.1. Bravo left SP for the military and returned in 1952, which by then had “changed to diesel engines.”

1970s—that containers fitted for rails, trucks and ships expedited cargo transfers while reducing labor costs and labor intensity.

The Interstate Highways that competed against railroads also ushered in suburbs, where older industries relocated from central cities (National Commission on Productivity and Council of Economic Advisers 1973). Railroads became less relevant to urban economies. The exclusive suburban space prevented African Americans and Chicanos from living adjacent to the new employment centers while the ones where they lived became less absorbent, while both groups were increasingly urban (McKee 2010; Self 2005; Sugrue 1996). Nonetheless the future of railroads was considered bleak through the 1960s, before they were reorganized. All the while railroad employment continued to decline. Suburbanization didn't just lead to the flight of industrial jobs from urban center to suburbs, but also the decline of railroads as trucking became the means to transport manufactures to retailers, who were increasingly suburban and away from the rails. One suburb that symbolized the industrial displacement of urban economies was Milpitas, California, a largely agricultural area into the early 1950s before attracting the Ford Assembly Plant away from Richmond, California. Agricultural fields became suburban space and the racially diverse agricultural proletariat displaced. Ironically, the only Mexicans in Milpitas not immediately displaced were those who worked on the Western Pacific Railroad that worked in tandem with the new Interstate Highway (Keesing, Hammond, and McAllister 1955).

A report by the White House's Council of National Advisers in 1973 offered neoliberal prescriptions for the railroad industry. Although acknowledging the sixty-one percent decline in railroad employment between 1947 and 1970, there was an even steeper decline of employment on the maintenance of way, from 265,000 to 87,000, or a 67 percent decline, respectively (National Commission on Productivity and Council of Economic Advisers 1973). The man hours worked in 1947 also fell 63.8 percent from 1947 to 1970 (National Commission on Productivity and Council of Economic Advisers 1973). Fifty-five percent of railroad operating costs were for labor in 1947, but by 1970, labor accounted for only forty-four percent (National Commission on Productivity and Council of Economic Advisers 1973). The steeper decline in railroad employment, however, disproportionately hurt Mexican and Mexican-American laborers. A reported 102,984 Mexican Braceros alone worked the maintenance of way in 1945 (Railroad Retirement Board 1945) while many Mexican Americans were not counted; but by 1972, half of the 16,000 "Spanish Surnamed American" railroad workers were categorized as "laborers" (Bureau of Labor Statistics 1972), an 84 percent decline. Considering the earlier undercount, the real decline was steeper. In other words, automation disproportionately affected Mexican maintenance of way employees. By 2019, only 4,000 workers worked on rails—as "rail track layers and maintenance equipment operators" combined (Bureau of Labor Statistics 2019).⁷

While containerization altered interstate transportation systems, the majority of jobs maintaining rails were already lost by the time the Port of Seattle became the first intermodal sea-

⁷ Though the subheading reads "Employed persons by detailed occupation, sex, race, and Hispanic or Latino ethnicity," no data on race of employment for "rail track layers and maintenance equipment operators" is available.

land container handling facility in the United States in 1970, as trade increased across the Pacific Rim (Sowers, Ciccantell, and Smith 2017; Heins 2016). Increased containerization meant more goods could be transported more cheaply via rail, truck, and ship. The spread of intermodal facilities across the United States, however, wasn't until the 1980s. Nevertheless, the process of transferring containers between ship and rail was mostly an automated one, reducing the labor necessary of older ports and railroad yards. Increased containerization also meant longer and heavier trains.

If the intermodal cargo container is synonymous with global trade and we use the Seattle intermodal facility as our starting point for globalization, more railroad maintenance of way jobs were lost in the 18 years *before* than in the five decades *since*. In other words, technological change eliminated more jobs than globalization. Because railroads also had to compete against other modes of passenger transport, the former's survival strategy was to focus on long-distance freight, which led to the termination of passenger service by the mid-1960s. The end of passenger service terminated the employment of the largely African American porters and their once-mighty union, the Brotherhood of Sleeping Car Porters (Arnessen 2001).

By the late 1940s, railroad companies were already running fewer but longer trains, requiring fewer engineers (National Commission on Productivity and Council of Economic Advisers 1973). By running heavier trains, they overwhelmed the existing roadbed and often derailed (Aldrich 2006). To summarize, railroad productivity, or output, only declined 16 percent from the end of World War II to 1972, but the railroad labor force shrunk by two-thirds in that same period (National Commission on Productivity and Council of Economic Advisers 1973). While it was argued that automation and streamlining limited the need for a human touch, the former maintenance of way workers and their wives argued to the contrary. When asked what was causing so many derailments on the Southern Pacific into the 1980s, Juanita Villegas Bernal, a former SP dispatcher and wife of a maintenance of way employee, pointed to the following:

No maintenance on the track...it's all a lack of maintenance. They don't have many people up there to work...the way it was maintained in the past was great.⁸

Circa 1950, a track crew that laid steel ranged from 75 to 100 laborers.⁹ By mid-century, the railroad was the safest it had ever been—for both travelers and workers on the rails. Mrs. Villegas had a point—derailments were indeed up after 1957 and maintenance, however increasingly mechanized, was deferred through the 1960s. Furthermore, heavier trains in use added more wear and tear on the rail infrastructure (Aldrich 2006). Also, after the deregulations of 1976, railroad companies began to subcontract the few maintenance of way jobs to private specialists (Aldrich 2018: 149-150).

⁸ Transcribed interview, Juanita Villegas Bernal, May 18, 1985. *Tucson Railroaders Oral History Project*. Arizona Historical Society, Tucson, AZ, AV 0001-03, p. 56.

⁹ Transcribed interview, Bernal, p. 25.

Conclusion

The Mexicans and African Americans (not just on the maintenance of way in the eastern states but also in passenger service) who lost their jobs in the railroad industry in the late 1950s and 1960s received scant attention from either the social sciences or the press, beyond Haber (1956, Haber along with colleagues (Haber and Kahn 1957; Haber et al. 1957), and Boggs ([1963] 2009). Though white workers also lost jobs on the maintenance of way, the new jobs that ushered in and necessitated by automation required college degrees, which circa 1970 meant disproportionately white.¹⁰ This initial period of transformation in the rail industry helps us better understand how automaton and suburbanization systematically eliminated jobs for people of color while job opportunities for whites increased. Though cities became deindustrialized before suburbs did (both due to automation and globalization), cities were the first to deindustrialize as manufacturers and warehouses no longer needed rail connections upon the advent of interstate highways and trucking. When railroads did recover, it was largely because they emphasized heavier long-distance shipments. Though “piggybacking” made for heavier wear and tear along the rails, and caused more derailments, jobs in the maintenance of way nonetheless continued to decline, with the smaller remaining workforce expected to cover more track miles.

The increased container traffic that took off since the 1980s should’ve meant more job possibilities on the maintenance of way, especially given all of the derailments that increased through the 1960s due to larger and longer trains on tracks against a roadbed not ready for them (Aldrich 2006). Automation killed the bulk of the jobs on the maintenance of way in the 1950s, *before* containerization synonymous with globalization transformed the means to transport freight. Automation undermined any future benefits of economic growth along the long-distance railroad corridors.

While globalization has received the bulk of attention, automation then as now killed more jobs (Hicks and Deveraj 2015). As Bonacich, Alimahomed and Wilson note, the danger of demanding protectionism against globalization and free trade (or immigration) is the lead-in to the narrative of racial others “stealing” jobs from implicitly deserving white workers (Bonacich, Alimahomed, and Wilson 2008). Automation, moreover, hurt workers of color on railroads and in central cities before they hurt white workers in exclusively white spaces. Black and Brown workers who lost their jobs in the railroad industry are a perfect example and reminder that technological changes are more severe threats to employment than globalization or immigration.

About the Author: Michael Calderón-Zaks is a Lecturer of Sociology at the University of California, San Diego.

¹⁰ In 1970, though only eleven percent of whites had completed college, only 4.4 percent of African Americans and 2.5 percent of Mexican Americans had completed college (U.S. Census 1999:169).

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