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FATAL SUBTRACTION: STATISTICAL MIAs ON THE INDUSTRIAL BATTLEFIELD

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> [W]hen the dead bodies of girls are found piled up against locked doors leading to the exits after a factory fire . . . who wants to hear about a great relief fund? What we want is to start a revolution.
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> . . . .
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> If we undertake to stop this unnecessary killing and injuring of workers in the course of industry . . . [t]he first thing we need is . . . complete and accurate information about the accidents that are happening. It seems a tame thing to drop so suddenly from talk of revolutions to talk of statistics. But I believe in statistics just as firmly as I believe in revolutions. And what is more, I believe statistics are good stuff to start a revolution with.[1]

A million workers in the United States have been killed in the line of duty alone since the mid-1920s.[2] Yet not until the Occupational Safety and Health Act of 1970 (OSHA) went into effect were employers generally obligated to "furnish to each of [their] employees employment and a place of employment which are free from recognized hazards that are causing or are likely to cause death or serious physical harm to [their] employees."[3] In order to promote this purpose, Congress ordered the Secretary of Labor to "develop and maintain an effective program of collection, compilation, and analysis of occupational safety and health statistics." Since that time it has been the Department of Labor's duty to "compile accurate statistics on work injuries and illnesses which shall include all disabling, serious, or significant injuries and illnesses, whether or not involving loss of time from work, other than minor injuries . . . ."[4]

Yet almost a quarter-century passed before the U.S. government even purported to know how many workers had been killed in the previous year by workplace injuries. The far greater number—estimated at 100,000 annually[5]—succumbing to occupational

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1. Crystal Eastman, *The Three Essentials for Accident Prevention*, 38 ANNALS AM. ACAD. POL. & SOC. SCI. 98, 99 (1911).

2. A total of 938,400 fatalities has been estimated for the years 1928 through 1992. Calculated according to data in NATIONAL SAFETY COUNCIL, ACCIDENT FACTS 1993 EDITION 26-27 (1993). For the mid-1920s, the managing director of the same organization estimated average annual industrial fatalities at 23,000. W. H. Cameron, *Organizing for Safety Nationally*, 123 ANNALS, Jan. 1926, at 27, 30.

3. Pub. L. No. 91-596, § 5(a), 84 Stat. 1590, 1593 (1970) (codified at 29 U.S.C. § 654(a) (1) (1988)).

4. *Id.* at § 24(a), 84 Stat. at 1614 (codified at 29 U.S.C. § 673(a)).

5. *OSHA Injury and Illness Information System: Hearing Before a Subcomm. of the House Comm. on Government Operations*, 98th Cong, 2d Sess. 27 (1984) (testimony of Karl Kronebusch, U.S. Office of Technology Assessment). Estimates range from 10,000 to 210,000.

illnesses and diseases neither the new Census of Fatal Occupational Injuries nor any governmental or private organization pretends to know.[6]

Thus, implausible as it may seem, despite the fact that the last state (Mississippi) enacted a workers' compensation statute almost a half-century ago, the United States still lacks comprehensive and accurate data on work-related fatalities. Public consciousness of the dangerousness of employment is not only underdeveloped, but shaped by and filtered through another agenda. For while the trade press concedes that "[t]he [construction] industry remains unnecessarily dangerous as a whole," its concerns appear to be not those whose lives are prematurely terminated, but employers' profits: a tripling of workers' compensation costs during the past decade is said to be "bleeding the industry dry."[7]

Throughout the twentieth century, one refrain of industrial accident literature has been martial: "War is commonly regarded as the most destructive of human events. But . . . occupational injuries cause far more casualties than war."[8] And if "the workshop is more dangerous than the battle field," then the American industrial battlefield is the most dangerous of all.[9] The leading early twentieth-century U.S. authority on workers' compensation for industrial accidents opened one of his books with an extended comparison between war and peace. Estimating, in the absence of national data, 25,000 deaths annually, E.H. Downey calculated that

> work accidents in the aggregate are equivalent to the losses of a perpetual campaign. Of deaths alone the twelve months' total is four times the number killed and mortally wounded in the battle of Gettysburg . . . . The toll of life and limb exacted . . . during the second decade of the twentieth century exceeds the nation's losses in battle from the Declaration of Independence to the present day.[10]

Significantly, since for Downey it was an "ugly fact . . . that work accidents . . . are due to causes inherent in mechanical industry . . . and in the hereditary traits of human nature," he saw "no prospect that the 'carnage of peace' will be terminated, as the carnage of war may be, within the predictable future." Consequently, just as patriots are fond of measuring the price of a nation's freedom in terms of battle deaths, so, too, consumer sovereignty takes its toll: "every machine-made commodity . . . ha[s] a definite cost in human blood."[11] To be sure, use of the term *accident* stands in jarring juxtaposition to the military imagery: most soldiers are killed intentionally, not acci-

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6. Guy Toscano & Janice Windau, *Fatal Work Injuries: Results from the 1992 National Census*, MONTHLY LABOR REVIEW, Oct. 1993, at 39, 42; COUNTING INJURIES AND ILLNESSES IN THE WORKPLACE: PROPOSALS FOR A BETTER SYSTEM 77-100 (Earl Pollack & Deborah Keimig ed. 1987). All published estimates of occupational illnesses and diseases have been termed a "gross underestimate." Harvey J. Hilaski, *Understanding Statistics on Occupational Illnesses*, MONTHLY LABOR REVIEW, Mar. 1981, at 25. For an overview of the problems involved in identifying occupational diseases, *see* PETER BARTH & H. HUNT, WORKERS' COMPENSATION AND WORK-RELATED ILLNESSES AND DISEASES (1980); Rainer Müller, *A Patient in Need of Care: German Occupational Health Statistics*, in THE SOCIAL HISTORY OF OCCUPATIONAL HEALTH 127 (Paul Weindling ed. 1985); OECD, EMPLOYMENT OUTLOOK, July 1990, at 105-22.

7. William Krizan, Hazel Bradford, & Steven Setzer, *Law of Jungle is Gaining Strength*, *ENR*, Jan. 31, 1994, at 70; Jon Nordheimer, *Pressure of Costs Drives Some Contractors to Stress Worker Safety*, N.Y. TIMES, Aug. 21, 1993, at 25.

8. HERMAN M. SOMERS & ANNE R. SOMERS, WORKMEN'S COMPENSATION: PREVENTION, INSURANCE, AND REHABILITATION OF OCCUPATIONAL DISABILITY 6 (1954).

9. EDISON L. BOWERS, IS IT SAFE TO WORK? A STUDY OF INDUSTRIAL ACCIDENTS 1, 2 (1930).

10. E. DOWNEY, WORKMEN'S COMPENSATION 1 (1924).

11. E. DOWNEY, HISTORY OF WORK ACCIDENT INDEMNITY IN IOWA 2-3, 4, 5 (1912).

dentally. And the seeming inappropriateness or quasi-oxymoronic character of industrial battlefield rhetoric is intensified in English by the double-meaning of *accident* as unexpected and unintended event on the one hand and injury on the other. But then even between belligerents the same ambiguity attaches to *casualty*.[12]

The rhetorical support mobilized on behalf of national safety legislation in the 1960s resurrected the bloody industrial battlefield imagery of the World War I era. Even President Nixon's new Secretary of Labor, George Shultz, soon to become a high executive at Bechtel Corporation, the world's largest construction firm, captured "the grim current scene" for Congress in a phrase that came to form a refrain in the ensuing debates.[13] Accepting the figure of the National Safety Council (NSC), a private corporate accident prevention organization, that industrial accidents killed 14,000 workers annually, Shultz remarked that: "During the last four years more Americans have been killed where they work than in Vietnam."[14]

In social or natural science investigations it is or should be methodologically self-explanatory that before any phenomenon can be counted, it must be conceptualized and defined.[15] To be sure, certain tricky definitional issues do exist that require clarification before industrial injury fatalities can be counted, but they have largely been resolved or at least disposed of.[16] For many decades, however, the more urgent issue has been for the state to implement adequate injury surveillance in order to conduct an accurate count; the resulting data could then be used for epidemiological studies on the basis of which the state could intervene in employers' operations to impose safer working conditions.[17]

This article analyzes the history of the failure to perform such an enumeration and its consequences for the health and safety of workers in the United States. In order to provide a more finely textured sense of the issues, throughout illustrative material is taken from construction, one of the most dangerous industries.[18] It remains an indus-

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12. On the rhetoric of war and injury, *see* ELAINE SCARRY, THE BODY IN PAIN: THE MAKING AND UNMAKING OF THE WORLD 60-157 (1985).

13. *See, e.g.*, 116 CONG. REC. 38,385 (1970) (Rep. Dent); *id.* at 38,387 (Rep. Gaydos).

14. *Occupational Safety and Health Act of 1969: Hearings Before the Select Subcomm. on Labor of the House Comm. on Education and Labor,* 91st Cong., 1st Sess. 112 (1969).

15. For an example of an author so intent on conceptualizing *accident* in terms of the "contract-form of employment" that he loses sight of its rootedness in a profit-driven economy, *see* Karl Figlio, *What Is an Accident?*, in THE SOCIAL HISTORY OF OCCUPATIONAL HEALTH at 180.

16. One such question, for example, is whether deaths occurring during travel to and from work should be included. In West Germany, for example, accidents on the way to and from work are compensable but are tabulated separately; in recent years, they have accounted for about one-third of industrial fatalities. BERICHT DER BUNDESREGIERUNG ÜBER DEN STAND DER UNFALLVERHÜTUNG UND DAS UNFALLGESCHEHEN IN DER BUNDESREPUBLIK DEUTSCHLAND: UNFALLVERHÜTUNGSBERICHT 1991, tab. 1 at 54, tab. 3 at 56 (Bundestag Doc. 12/3988, 1992). Under the "Going and Coming Rule," absent special circumstances such as employer-provided transportation, injuries sustained while traveling to and from work are not compensable under state workers' compensation statutes in the United States. 1 ARTHUR LARSON, WORKMEN'S COMPENSATION LAW, § 15.11 at 4-3 (1992). The claim that many state workers' compensation boards count commuting deaths as job-related is, without qualification, incorrect. *See* J. Paul Leigh, *Estimates of the Probability of Job-Related Death in 347 Occupations*, 29 J. OCCUPATIONAL MED. 510 (1987). *See also* NIOSH, FATAL INJURIES TO WORKERS IN THE UNITED STATES, 1980-1989: A DECADE OF SURVEILLANCE: NATIONAL PROFILE, App. I (1993) (excluding such deaths); 1 INT'L LAB. OFFICE, ENCYCLOPAEDIA OF OCCUPATIONAL HEALTH AND SAFETY 12-13 (1971); OECD EMPLOYMENT OUTLOOK, July 1989, at 136 (varying practices in European countries).

17. *See* Lawrence P. Hanrahan & Michael B. Moll, *Injury Surveillance*, AM. J. PUB. HEALTH, Dec. 1989 (Supp.), at 38.

18. Early on researchers recognized that construction workers were also subject to severe occupa-

try in which researchers seriously explore correlations between the lunar cycle and injuries,[19] and employers are not embarrassed to say that "they're 'expected,' based on insurance premiums, to kill three workers on a large project or that it's 'acceptable' to have one death for every three-fourths of a mile of new tunnel completed."[20]

The article begins with an account of the statistical chaos and confusion engendered by the murderous pace of production at the beginning of the twentieth century. Following a survey of flawed private and government efforts to count the dead at work since the 1920s, the focus shifts to the statistical and enforcement defects of OSHA. After analyzing the fatality trends uncovered by the new Census and a renewed tendency to divert attention from the antagonism between safety and profits, the article concludes with a critique of one important use to which occupational fatality data have been put—economic and legal theories that assert that workers in especially dangerous occupations are compensated for the risks to which they are exposed.

In the Beginning was *Tohu Vabohu*

> In the nineteenth century, what was counted was what counted.[21]

By the first decade of the twentieth century, observers had identified a close relationship between the seemingly limitless expansionism of capitalism in the United States and its merciless subordination of all activities to the criterion of profitability. The monomaniacal drive to reduce production costs on which U.S. capital's successful "struggle . . . for international industrial supremacy" and conquest of the world market hinged was in large part made possible by a "stupendous loss" of life.[22] In 1905, Werner Sombart, the German economic historian, according to whose most enduring *bon mot* all socialist utopias in the United States foundered on "roast beef and apple pie,"[23] was nevertheless impressed by the tendency of unbridled capital accumulation there to assert itself "over dead bodies."[24] The 75,000 railway employees killed during the quarter-century preceding World War I was only the most vivid illustration of the greater speed and lower level of accident prevention characteristic of U.S. enterprise. At the peak of this industrial slaughter, in 1907, 7,776 workers were killed on railroads and in coal mines alone.[25]

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tional illness and disease risks; lead poisoning, for example, was a leading cause of death among painters. BUREAU OF LABOR STATISTICS, U.S. DEPT. OF LABOR, BULL. NO. 207: CAUSES OF DEATH BY OCCUPATION: OCCUPATIONAL MORTALITY EXPERIENCE OF THE METROPOLITAN LIFE INSURANCE CO. INDUSTRIAL DEPARTMENT, 1911-1913, at 50-52 (1917); U.S. DIVISION OF LABOR STANDARDS, Bull. No. 7: RECENT CHANGES IN THE PAINTERS' TRADE (1936) (by Alice Hamilton). On such typical bricklayers' health problems as back injuries, *see* STUDENTERFRONTEN VED AARHUS UNIVERSITET, MURERRAPPORTEN 58-69 (n.d. [ca. 1972]).

19. Jimmie Hinze & Jair Roxo, *Is Injury Occurrence Related to Lunar Cycles?* 110 J. CONSTRUCTION ENGINEERING & MGMT. 409 (1984).

20. Gregg LaBar, *Breaking New Ground in Construction Safety*, OCCUPATIONAL HAZARDS, May 1992, at 58.

21. PATRICIA C. COHEN, A CALCULATING PEOPLE: THE SPREAD OF NUMERACY IN EARLY AMERICA 207 (1982).

22. C.H. Mark, *Our Murderous Industrialism*, 12 WORLD TO-DAY 97 (1907).

23. WERNER SOMBART, WARUM GIBT ES IN DEN VEREINIGTEN STAATEN KEINEN SOZIALISMUS? 126 (1906).

24. Werner Sombart, *Studien zur Entwicklungsgeschichte des nordamerikanischen Proletariats: I. Einleitung*, 21 ARCHIV FÜR SOZIALWISSENSCHAFT UND SOZIALPOLITIK 210, 212 (1905).

25. *See* U.S. BUREAU OF THE CENSUS, HISTORICAL STATISTICS OF THE UNITED STATES, COLONIAL TIMES TO 1970, pt. 1, ser. M 271 at 607 and pt. 2, ser. Q. 404 at 740 (bicentennial ed. 1975); 2

U.S. industry during those years "had the reputation of being the most reckless in the world,"[26] and the U.S. Department of Labor found "a frightful disregard of human life. Accident occurrence had reached a condition not paralleled perhaps at any other time or place."[27] Fatality rates in U.S. coal mines were almost triple those in the United Kingdom and almost double those in Prussia; accident rates among U.S. railway employees were two and one-half times as high as on the German railways.[28]

In urging the adoption of injury liability and insurance legislation, Progressives and muckrakers[29] graphically portrayed the human cost of U.S. capitalism's "precious industrial supremacy." Arthur Reeve performed the transatlantic arithmetic: every year "the industrial Juggernaut" drew a million immigrants from Europe to maintain its unprecedented speed, and every year the "sheer brutal carelessness . . . of greedy employers," for whom "[l]aw departments and human life" were cheaper than the cost of accident protection, killed or injured half a million.[30] Crystal Eastman's contribution to *The Pittsburgh Survey* was a landmark account of the fatalities in heavy industry.[31] Upton Sinclair's depiction of the horrible ways in which industrialized slaughterhouses killed workers as well as animals helped galvanized public opinion—if only to institute federal meat inspection.[32] In his powerful indictment, "Making Steel and Killing Men," William Hard asked: "Must we continue to be obliged to think of scorched and scalded human beings whenever we sit on the back platform of an observation-car and watch the steel rails rolling out behind us?"[33]

Early twentieth-century labor union leaders, echoing *Scientific American*, underscored how much higher per capita industrial fatality rates were in the United States than in Europe.[34] Samuel Gompers, the president of the American Federation of Labor, upbraiding "Moloch" for the thousands of annual sacrifices that its "industrial slaughter" claimed,[35] charged that this toll of "maimed, crippled and killed gives our employing classes the reputation of being heartless, and even bloody."[36] And the Federation's vice-president, John Mitchell, while conceding that the number of fatalities and injuries was "not even officially counted" in the United States, nevertheless drew from the estimates of industrial casualty rates triple those in Europe the "inevitable conclusion that if it cost more to kill a workman in America than to protect him, as it does in Europe, the American workman would not be killed, he would be protect-

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HARRY A. MILLIS & ROYAL E. MONTGOMERY, THE ECONOMICS OF LABOR: LABOR'S RISKS AND SOCIAL INSURANCE 187 (1938).

26. 13 ENCYCLOPAEDIA OF THE SOCIAL SCIENCES 504 (1937) (s.v. "Safety Movement").

27. BUREAU OF LABOR STATISTICS, U.S. DEPT. OF LABOR, BULL. NO. 234: THE SAFETY MOVEMENT IN THE IRON AND STEEL INDUSTRY 1907 TO 1917, at 13 (1918) (written by Lucian W. Chaney & Hugh S. Hanna).

28. BUREAU OF LABOR STATISTICS, U.S. DEPT. OF LABOR, BULL. NO. 157: INDUSTRIAL ACCIDENT STATISTICS 101 (1915) (by Frederick Hoffman) (data for 1907-1912); Frederick Hoffman, *Industrial Accidents*, in U.S. Bureau of Labor, BULLETIN, No. 78, Sept. 1908, at 417, 458 (data for 1897-1906).

29. *See* Paul Uselding, *In Dispraise of the Muckrakers: United States Occupational Mortality, 1890-1910*, in 1 RESEARCH IN ECONOMIC HISTORY 334 (Paul Uselding ed. 1976).

30. Arthur Reeves, *Our Industrial Juggernaut*, 16 EVERYBODY'S MAG. 147, 148 (1907).

31. CRYSTAL EASTMAN, WORK ACCIDENTS AND THE LAW (1910).

32. UPTON SINCLAIR, THE JUNGLE (1906); GABRIEL KOLKO, THE TRIUMPH OF CONSERVATISM: A REINTERPRETATION OF AMERICAN HISTORY, 1900-1916, at 98-108 (1977) (1963).

33. William Hard, *Making Steel and Killing Men*, 17 EVERYBODY'S MAG. 579, 581 (1907).

34. *The "Casualty List" of American Industries*, 96 SCI. AM. 126 (1907) (editorial).

35. Samuel Gompers, *Industrial Slaughter and the "Enlightened Employers,"* 14 AM. FEDERATIONIST 548, 549 (1907).

36. Samuel Gompers, *The Price We Pay*, 17 AM. FEDERATIONIST 665, 665 (1910).

ed . . . ."[37]

A long line of observers has remarked on the extraordinary dangers of construction work in the United States, which has accounted for 15 percent of all occupational fatalities (150,000 since 1933)—about three times the industry's share of total employment.[38] The International Association of Bridge and Structural Ironworkers, for example, reported that one per cent of its membership—109 workers—were killed in accidents in fiscal year 1911-12.[39] (Sixty years later the union was still losing 100 members a year to work-related fatalities.)[40] At the same time, the premier construction-engineering journal editorially conceded: "It must be frankly accepted that the most efficient method of prosecuting work is not always the safest."[41] Conversely, the "safe builder is . . . put at a disadvantage in bidding . . . ."[42]

In part because the peculiar constellations of class conflict in the industrializing societies of Western Europe had led already in the nineteenth century to the imposition of certain statutory—albeit often weakly enforced—duties on employers to protect their employees from workplace dangers,[43] representatives of organized labor from other countries were also impressed by the dearth of safety precautions in the United States. During his visit to the United States shortly before World War I, the chairman of the General Commission of the German Free Trade Unions noted the lack of protective

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37. John Mitchell, *Burden of Industrial Accidents*, 38 ANNALS AM. ACAD. POL. & SOC. SCI. 76, 77, 78 (1911).

38. *See e.g.*, NATIONAL SAFE WORKPLACE INSTITUTE, FAILED OPPORTUNITIES: THE DECLINE OF U.S. JOB SAFETY IN THE 1980S 5-6 (1988); NATIONAL SAFE WORKPLACE INSTITUTE, UNMET NEEDS: MAKING AMERICAN WORK SAFE FOR THE 1990S, at 9-10 (1989); R. Blake Smith, *Getting to the Bottom of High Accident Rates*, OCCUPATIONAL HEALTH & SAFETY, June 1993, at 34. For the underlying employment data, *see* BUREAU OF LABOR STATISTICS, U.S. DEPT. OF LABOR, BULL. NO. 1865: HANDBOOK OF LABOR STATISTICS—REFERENCE EDITION, at 105, 118 tbls. 39, 46 (1975); EMPLOYMENT AND EARNINGS, Dec. 1993, tab. A-25 at 37. High construction accident rates relative to those in manufacturing appear to be invariant in capitalist, socialist, and underdeveloped countries although the levels in socialist countries were lower. *See e.g.*, INTERNATIONAL LABOUR OFFICE, YEAR BOOK OF LABOUR STATISTICS, 1974, at 724-28 (1974); INTERNATIONAL LABOUR OFFICE, YEAR BOOK OF LABOUR STATISTICS, 997-1052 (1992).

39. LUKE GRANT, THE NATIONAL ERECTORS' ASSOCIATION AND THE INTERNATIONAL ASSOCIATION OF BRIDGE AND STRUCTURAL IRONWORKERS 8 (Leon Stein & Philip Taft eds., Arno Press Inc. 1971) (1915).

40. Frederick C. Klein, *Ironworker Tom West Wrestles Steel Beams High Above the Ground*, WALL ST. J., Mar. 4, 1971, at 1. The membership's annual fatality rate was still close to one per cent. For additional corroboration, *see* Frank S. McElroy & George R. McCormack, *Injury Rates in Construction Occupations, 1948*, MONTHLY LAB. REV., March 1950, at 387, 388 (vol. 70).

41. *Reducing Casualties on Construction Work*, 72 ENGINEERING NEWS 145 (1914) (editorial).

42. Ethelbert Stewart, *Accidents in the Construction Industry*, MONTHLY LAB. REV., Jan. 1929, at 63, 65 (vol. 28).

43. The British factory acts as early as 1844 required employers to equip machines with guards. An Act to amend the Laws relating to Labour in Factories, 7 & 8 Vict., c. 15, §§ 21, 59 (1844); An Act to consolidate and amend the Law relating to Factories and Workshops, 41 & 42 Vict., c. 16, § 5 (1878); An Act to consolidate with Amendment the Factories and Workshop Acts, 1 Edw. 7, c. 22, § 10 (1901). *See generally*, P. BARTRIP & S. BURMAN, THE WOUNDED SOLDIERS OF INDUSTRY: INDUSTRIAL COMPENSATION POLICY 1833-1897, at 54-96 (1983). The Industrial Code for the North German Confederation of 1869 obligated covered employers to provide and maintain all facilities necessary to protect their workers against dangers to life and health. Gewerbeordnung für den Norddeutschen Bund, 21 June 1869, BGBl des Norddeutschen Bundes, § 107 at 270. Despite the expansive scope of this provision, the state failed to enforce it vigorously. Lothar Machtan, *Workers' Insurance Versus Protection of the Workers: State Social Policy in Imperial Germany*, in THE SOCIAL HISTORY OF OCCUPATIONAL HEALTH at 209. The 1891 amendments to the Industrial Code added the weasel words, "as the nature of the operation permits." Gesetz, betreffend Abänderung der Gewerbeordnung, 1 June 1891, RGBl, § 120a at 5.

measures on skyscrapers, which led the industry to reckon with one death per story. Compared with German workers, who in Carl Legien's opinion had already eliminated the worst abuses, U.S. workers had the capacity to achieve much more through legislation. But "human life on the other side of the big pond is apparently given little value, social feeling has not yet become the common good of the progressive working class."[44]

Coming from the representative of a national working class that had recorded more than 115,000 industrial fatalities during the first 18 years of operation of Bismarck's accident insurance law, this judgment was not made lightly.[45] But Legien's observations also reflected the fact that the working class in the United States before World War I, still "dumbfounded by the noise of production," as it were, had not yet "come to" and initiated resistance[46] to the deterioration of working conditions brought on by the task compression, deskilling, and speed-ups associated with the new industrial drive system.[47] The combined impact of labor-saving mechanization and the massive growth of an increasingly ethnically divided labor supply resulting from the unprecedented volume of immigration created such a large "standing army of the unemployed" even during periods of prosperity[48] that even labor unions did "not feel strong enough to enforce demands which would involve large outlays by employers for safe equipment and other improvements."[49]

Thus of the strikes at more than 40,000 building trades establishments during the last two decades of the nineteenth century, only one was "for better arrangements for safety"; the comparable total among 15,000 coal and coke establishments was only seven.[50] Workers and their unions had to wait more than a half-century for the kind of federal statute that could impose national safety standards on firms and thus preclude the competitive race to the bottom with which employers are wont to threaten employees as the result of union demands for better working conditions.[51] In the meantime, even for the United Mine Workers safety issues remained peripheral to maintaining the union's strength.[52]

These international comparative impressionistic accounts appear to accord with the available data. In the United Kingdom, for example, which has maintained a much more centralized yet far from all-inclusive or uniform statistical collection system since

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44. C. LEGIEN, AUS AMERIKAS ARBEITERBEWEGUNG 51, 52, 54 (1914). *See also* MARTIN WAGNER, AMERIKANISCHE BAUWIRTSCHAFT 27, 43 (1925).

45. 26 STATISTISCHES JAHRBUCH FÜR DAS DEUTSCHE REICH 1905, at 268 (1905) (with data for 1886 to 1903). This was the last year in which the Imperial Statistical Office printed the total of all fatalities since the inception of the Accident Prevention Law.

46. 1 KARL MARX, DAS KAPITAL: KRITIK DER POLITISCHEN ÖKONOMIE 253 (1867 & photo reprint 1959).

47. *See* DAVID GORDON ET AL., SEGMENTED WORK, DIVIDED WORKERS: THE HISTORICAL TRANSFORMATION OF LABOR IN THE UNITED STATES 127-62 (1982).

48. Lorenzo Lewelling ["The Tramp Circular"], DAILY CAPITAL [Topeka], Dec. 5, 1893, reprinted in THE POPULIST MIND 330, 331 (Norman Pollack ed. 1967) (populist governor of Kansas).

49. ISAAC A. HOURWICH, IMMIGRATION AND LABOR: THE ECONOMIC ASPECTS OF EUROPEAN IMMIGRATION TO THE UNITED STATES 486 (2d ed., B.W. Huebsch, Inc. 1922) (1912).

50. SIXTEENTH ANNUAL REPORT OF THE COMMISSIONER OF LABOR, 1901: STRIKES AND LOCKOUTS 469-74, 478-83 (1901).

51. For a sustained argument that class struggle took the form of individual litigation, *see* Anthony F. Bale, Compensation Crisis: The Value and Meaning of Work-Related Injuries and Illnesses in the United States, 1842-1932 (1986) (unpublished Ph.D. dissertation, Brandeis University).

52. WILLIAM GRAEBNER, COAL-MINING SAFETY IN THE PROGRESSIVE PERIOD: THE POLITICAL ECONOMY OF REFORM 127-39 (1976).

the mid-nineteenth-century,[53] during the entire period from 1896 to 1991, total recorded construction fatalities amounted to only about 16,000.[54] The construction industry in the United States, with a population two to four times as large during the twentieth century, may have produced fifteen to twenty times as many deaths. At the end of the twentieth century, U.S. industrial fatality rates in general and in construction in particular remain international outliers.[55]

In fact, however, no one in the early twentieth century knew how many industrial soldiers were being mortally wounded each year in the United States. If the state apparatus counts only what counts, then apparently "[n]o one seem[ed] to care very much if we do kill more people in one year of peace than were slain and wounded throughout the terrible Russo-Japanese war."[56] A striking manifestation of this apparent insouciance and the chief technical reason for this nescience was the lack of any statutory obligation for employers to report workplace fatalities in any state until the 1880s; even thereafter such duties were limited and poorly enforced.[57] The individual state factory inspectors' reports were not only "very defective," but also so lacking in uniformity as to "preclude[] the possibility of an accurate interstate comparison."[58] Despite congressional enactments requiring railroads to report injuries to the Interstate Commerce Commission and subjecting them to money penalties for noncompliance,[59] not even this oldest and most complete series was entirely trustworthy.[60]

Reeve's proposal in 1907 that the states require all accidents to be reported to their labor bureaus and that the federal Department of Commerce and Labor process national tabulations[61] was one whose time has still not come at the end of the century. Bereft of a mandatory-institutionalized infrastructure, even government agencies were

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53. BARTRIP & BURMAN, THE WOUNDED SOLDIERS OF INDUSTRY at 37-53 (on nineteenth-century data collection by factory inspectors); SAFETY AND HEALTH AT WORK: REPORT OF THE COMMITTEE 1970-72, at 134-38, 161 (Cmnd.5034, 1972); SANDRA DAWSON ET AL., SAFETY AT WORK: THE LIMITS OF SELF-REGULATION 27 (1988).

54. DEPARTMENT OF EMPLOYMENT AND PRODUCTIVITY, BRITISH LABOUR STATISTICS: HISTORICAL ABSTRACT 1886-1968, at 399-400 (1971) (U.K.); CENTRAL STATISTICAL OFFICE, ANNUAL ABSTRACT OF STATISTICS 1974, No. 111, at 75 (1974) (U.K.); CENTRAL STATISTICAL OFFICE, ANNUAL ABSTRACT OF STATISTICS 1984, No. 120, at 71 (1984) (U.K.); CENTRAL STATISTICAL OFFICE, ANNUAL ABSTRACT OF STATISTICS 1992, No. 128, at 72 (1992) (U.K.); CENTRAL STATISTICAL OFFICE, ANNUAL ABSTRACT OF STATISTICS 1993, No. 129, at 70 (1993) (U.K.).

55. *Legislative Hearings on H.R. 1063, the Construction Safety, Health, and Education Improvement Act of 1991: Hearings Before the Subcomm. on Health and Safety of the House Comm. on Education and Labor*, 102d Cong., 1st Sess. 257 (Serial No. 102-15, 1991) (testimony of Dr. Knut Ringen); THOMAS MCGARITY & SIDNEY SHAPIRO, WORKERS AT RISK: THE FAILED PROMISE OF THE OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION 4-5 (1993). Since the ILO data on fatality rates that Ringen used are based on at four different national bases (per man-hours, man-years, workers exposed to risk, and persons employed), it is unclear how Ringen reduced them all to a per 1,000 workers common basis. *See* INTERNATIONAL LABOUR OFFICE, YEAR BOOK OF LABOUR STATISTICS at 1042 (1992); INTERNATIONAL LABOUR OFFICE, CURRENT INTERNATIONAL RECOMMENDATIONS ON LABOUR STATISTICS 1988 EDITION 101-104 (1988).

56. Reeve, *supra* note 30, at 147.

57. JOHN COMMONS & JOHN ANDREWS, PRINCIPLES OF LABOR LEGISLATION 160-63 (4th ed. 1967).

58. Hoffman, *supra* note 28, at 421. *See generally*, [NEW YORK STATE COMMISSION ON EMPLOYERS LIABILITY], REPORT TO THE STATE OF NEW YORK: FIRST REPORT 191-93, 197 (1910); I. RUBINOW, SOCIAL INSURANCE: WITH SPECIAL REFERENCE TO AMERICAN CONDITIONS 49-85 (1913).

59. Act of Mar, 3, 1901, ch. 866, 31 Stat. 1446; Act of May 6, 1910, ch. 208, 36 Stat. 350.

60. BUREAU OF LABOR STATISTICS, U.S. DEPT. OF LABOR, BULL. NO. 157: INDUSTRIAL ACCIDENT STATISTICS at 7.

61. Reeve, *supra* note 30, at 156.

reduced to speculation. Thus the U.S. Bureau of Labor published a guesstimate based on fragmentary data of 17,500 in 1908[62] followed by another of 25,000 in 1913;[63] at the same time the U.S. Commission on Industrial Relations reported a figure of 35,000.[64] Yet the following year the U.S. Commissioner of Labor Statistics readily conceded that "[i]ndustrial accident statistics for the United States do not exist,"[65] and a decade later his successor repeated the profession and laments of ignorance.[66]

The wave of enactments of workers' compensation legislation in about three-fourths of the states between 1911 and U.S. entry into World War I[67] should, in theory, have created a source of broad (though by no means comprehensive) and accurate data on work-related fatalities on the basis of which prevention programs could have been developed. Unlike the Bismarckian insurance scheme, which preceded U.S. laws by three decades,[68] the various state workers' compensation statutes, however, failed to generate a nationally uniform reporting system.[69] Thus estimates of 10,000 to 12,000 annual fatalities for 1917 to 1919 based on aggregating state workers' compensation claims were accompanied by disclaimers of inadequacy, incompleteness, and noncomparability.[70]

Despite the lack of comprehensive statistics, management was well aware that construction work, with fatality and serious injury rates running in excess of four times those in factories, was "extra hazardous." Editorializing under the ambiguous title, "Unwarranted Accident Waste in Construction," *Engineering News-Record*, the industry's principal trade journal, observed toward the close of World War I that "[c]asualties on the battle front in France exhibit hardly a worse record of fatalities."[71] The owner of the leading skyscraper construction firm confirmed at the end of the boom of the 1920s that over the previous ten-year period, one steel erector died for

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62. Hoffman, *supra* note 28, at 418.

63. *Supra* note 60.

64. 1 U.S. COMMISSION ON INDUSTRIAL RELATIONS, INDUSTRIAL RELATIONS: FINAL REPORT AND TESTIMONY, S. DOC. NO. 415, 64th Cong., 1st Sess. 70 (1916).

65. BUREAU OF LABOR STATISTICS, U.S. DEPT. OF LABOR, BULL. NO. 210 *The Why and How of Uniform Industrial Accident Statistics for the United States*, 91 (written by Royal Meeker) (Proceedings of the Third Annual Meeting of the International Association of Industrial Accident Boards and Commissions, 1916).

66. Ethelbert Stewart, *Are Accidents Increasing?* MONTHLY LAB. REV., Aug. 1926, at 46-49 (vol. 23); Ethelbert Stewart, *Industrial Accidents in the United States*, ANNALS, Jan. 1926, at 1. *See also* Leonard W. Hatch, *The Problem of National Accident Statistics*, MONTHLY LAB. REV., Oct. 1926, at 42-47 (vol. 23).

67. *See* BUREAU OF LABOR STATISTICS, U.S. DEPT. OF LABOR, BULL. NO. 203: WORKMEN'S COMPENSATION LAWS OF THE UNITED STATES AND FOREIGN COUNTRIES, at 9, 12-13 (1917).

68. Unfallversicherungsgesetz, July 6, 1884, RGBl 69. Coverage was broad, and employers were required to report deaths to the police; *id.* §§ 1, 51-52 at 69, 91. On the origins of social insurance as an attempt to control the working class, *see* GASTON RIMLINGER, WELFARE POLICY AND INDUSTRIALIZATION IN EUROPE, AMERICA, AND RUSSIA 112-22 (1971); HANS-ULRICH WEHLER, BISMARCK UND DER IMPERIALISMUS 459-64 (1976 [1969]); Machtan, *Workers' Insurance*.

69. *See* 7 HANDWÖRTERBUCH DER STAATSWISSENSCHAFTEN 260, 285 (J. Conrad et al. 2d ed. 1901) (s.v. "Unfallstatistik" and "Unfallversicherung"). Even the German system was not universal. *See* 26 STATISTISCHES JAHRBUCH FÜR DAS DEUTSCHE REICH 1905, at 268 n.1 (1905); Müller, *A Patient in Need of Care*.

70. Margaret Gadsby, *Inadequacy of Industrial Accident Statistics Published in State Reports*, MONTHLY LAB. REV., March 1921, at 167, 167-72 (vol. 12). *See also* BUREAU OF LABOR STATISTICS, U.S. DEPT. OF LABOR, BULL. NO. 339: STATISTICS OF INDUSTRIAL ACCIDENTS IN THE UNITED STATES 1-8 (1923) (written by Lucian Chaney).

71. *Unwarranted Accident Waste in Construction,* 81 ENGINEERING NEWS-RECORD 298 (1918).

every thirty-three hours of employed time.[72]

In the early 1920s, the U.S. Bureau of Labor Statistics (BLS), using a highly speculative set of assumptions, estimated annual industrial fatalities at 30,039.[73] This pseudo-precision did not mislead the Secretary of Labor, who noted in his annual report, that "[i]t is not greatly to the credit of our people that nobody knows . . . even the annual number of industrial fatalities."[74] The lack of federal regulation or oversight of working conditions before the New Deal was in large part responsible for the lack of any nationally uniform labor statistics.[75] In order to make a small start toward abating this ignorance—an initiative that did not even rise to the level of government information-gathering as an aid to legislation[76]—bills were filed in both houses of Congress in 1926 to establish a division of safety within the BLS to collect and analyze data on industrial accidents "with special reference to their causes, effects, and occupational distribution."[77] The chief sponsor in the House of Representatives, continuing the tradition of military metaphors, suggested "that many great battles of the world have not caused so many casualties as perhaps one year of industry in the United States."[78] That the bill was never enacted and the division of safety therefore not created can in part be accounted for by the dizzy-with-success free enterprise of the 1920s, legislatively embodied by Senator Hiram Bingham. A former history professor at Yale and governor of Connecticut, he contended that workers' compensation statutes had literally eliminated all problems:

> [I]n Connecticut . . . [w]e passed an employer's liability compensation act, which requires all employers . . . to see to it that their employees should be protected at work. Now, this had the very natural effect of making the manufacturers do what they should have done before, look into the causes of their own accidents and guard against them. [T]his is the proper theory of government, to put on the individual the initiative of seeing to it that he corrects his own errors, rather than to have the Government tell him what he must do in order to correct them, and that is the reason, I take it, why we do not find it necessary to collect accident statistics any more; it is because the workmen are protected, and the manufacturers themselves are seeing to it that they can and do establish the very latest form of safety devices, for their own protection, and for the saving in insurance, and for the safety of their workers.

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72. W. STARRETT, SKYSCRAPERS AND THE MEN WHO BUILD THEM 301 (1928).

73. Carl Hookstadt, *Estimated Annual Number and Cost of Industrial Accidents in the United States*, MONTHLY LAB. REV., Nov. 1923, at 1, 6 tbl. 4 (vol. 17). These figures included all gainfully employed persons; among employees, fatalities totaled 21,232.

74. U.S. DEPARTMENT OF LABOR, ELEVENTH ANNUAL REPORT OF THE SECRETARY OF LABOR FOR THE FISCAL YEAR ENDED JUNE 30, 1923, at 59 (1923). *See also* Charles H. Verrill, *Industrial Accident and Compensation Statistics*, 12 AM. ECON. REV. 137 (Supp. 1922).

75. JOSEPH DUNCAN & WILLIAM SHELTON, REVOLUTION IN UNITED STATES GOVERNMENT STATISTICS: 1926-1976, at 18 (U.S. Dept. of Commerce, 1978); LAURENCE F. SCHMECKEBIER, THE STATISTICAL WORK OF THE NATIONAL GOVERNMENT 132-37 (1925).

76. For a typology of arguments in favor of government data collecting, *see* Steven Kelman, *The Political Foundations of American Statistical Policy*, in THE POLITICS OF NUMBERS 275, 280-93 (William Alonso & Paul Starr eds. 1987).

77. *Division of Safety: Hearings on H.R. 11886 Before the House Committee on Labor*, 69th Cong., 1st Sess. 1 (1926).

78. *Id.* at 3 (statement of Rep. Rathbone).

> The thing works out there in the proper way.[79]

Such market-knows-best anti-paternalism[80] carried the day during the "New Capitalism" of the Republican ascendancy, prefiguring the emergence of an econometrically sophisticated market-inspired critique of state intervention a half-century later.[81] Senator Bingham's opposition ultimately caused the bill to fail, but even business knew better than to trust such mechanistic wishful thinking.[82] Thus at the height of the boom, just days before the stock market crash, William Wheeler, one of construction management's safety spokesmen, observed that "[t]his human sacrifice, chargeable to the industry, is unnecessary and avoidable." However, "[h]umanitarianism is not required to tell contractors what to do when an economic need, rather an economic justification for it, is clearly shown." That economic basis was simply that "the industry pays altogether too large an accident bill which represents pure waste of productive capital." Yet in trying to identify the financial incentives that would motivate construction firms to pursue safety measures, Wheeler specified for the Annual Safety Congress of the National Safety Council (NSC) how "all accidents are 'caused'":

> Progressive and successful contractors . . . have learned that the most important thing in the building industry is *time*; that material and men must be kept moving *without loss of time* if a building is to be ready on the contemplated date; and also, that *all* of their equipment, labor and capital must be used *all of the time* if maximum profits are to be counted. The tenor of the present day building business is unrelenting competition, fast production with rising pressure upon personnel and equipment. This is a fast moving era and speed is its urge. The business of today that succeeds must move fast . . . .[83]

Wheeler was merely localizing in construction the larger truth about the "Penalty the American Nation Pays for Speed."[84] The BLS agreed that the fact that "[b]oth contractor and owner are apt to be anxious to push the job with all practicable speed" was among the factors "conspir[ing] to render difficult the task of securing a reasonable degree of safety."[85] Unsurprisingly, then, in the depths of the Great Depression, the National Conference on Construction, through its Committee on Elimination of Waste and Undesirable Practices, conceded that "the industry has no practical plan for accident prevention" despite the fact that knowledge of "the real causes of the accidents" was available.[86]

Despite the carnage that capital in construction and elsewhere was leaving in its

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79. *To Create a Division of Safety in the Department of Labor: Hearings on S. 3983 Before the Senate Comm. on Education and Labor*, 69th Cong., 1st Sess. 39 (1926).

80. *Id.* at 39, 45.

81. *See, e.g.*, ROBERT S. SMITH, THE OCCUPATIONAL SAFETY AND HEALTH ACT (1976).

82. 68 CONG. REC. 5030 (1927); *see also id.* at 1015-18; S. REP. NO. 1288, 69th Cong., 2d Sess. (1927).

83. William Wheeler, *Results Through Voluntary Cooperation in Accident Prevention in Construction, reprinted in* 1929 TRANSACTIONS OF THE NATIONAL SAFETY COUNCIL: EIGHTEENTH ANNUAL SAFETY CONGRESS 1:650, 655 (1929) (executive secretary of the Committee on Accident Prevention of the Building Trades Employers' Association of the City of New York).

84. Harry Mock, *Penalty the American Nation Pays for Speed*, MONTHLY LAB. REV., Oct. 1927, at 55 (vol. 25).

85. BUREAU OF LABOR STATISTICS, U.S. DEPT. OF LABOR, BULL. NO. 425: RECORD OF INDUSTRIAL ACCIDENTS IN THE UNITED STATES TO 1925, at 104 (1927).

86. NATIONAL CONFERENCE ON CONSTRUCTION, REPORTS: GENERAL MEETING, pt. 13 at 3 (1932).

wake, data remained sparse. Echoing complaints that it had already voiced during the heady 1920s,[87] the BLS acknowledged at the beginning of the New Deal that:

> Accurate information on industrial injuries in the United States is unfortunately not available. Not only is it impossible to determine with any degree of accuracy the causes of accidents, the nature of the injuries, the extent of the disabilities, the number of workers handicapped through injury, or the cost in time or money lost through industrial injuries, but even the most elementary part of information relating to industrial injuries—the total number of disabling injuries sustained by industrial workers within a given year—is not available for the country as a whole.
>
> It would seem to be a rather simple matter to determine the number of fatal and nonfatal industrial injuries in each State and combine these in a complete tabulation. This, has, however, not been possible, partly through lack of reporting in States which have not adopted workmen's compensation laws or from industries not covered by the law in other States.[88]

By the end of the 1930s, when construction was "by far the most hazardous" industry,[89] the BLS may still not have had precise figures, but it knew enough to add a new twist to the rhetoric of *bellum accidentum*: "The number of workers killed at their jobs during 1937 was more than 4 times the number of soldiers killed during the entire Revolutionary War."[90]

The National Safety Council: "Safety First"—and Accuracy Last[91]

> There is no step, no forward step made by what we call the proletariat, the working population, against the power-holding class except in one way . . . . [O]rganized labor, the organized proletariat, the organized—whatever you may please to call it—has never won a substantial victory over that power-holding class, except in one way, and that is upon the Christian or moral right, and that can lick the hard boiled and the standpatters.[92]

In the absence of any general-purpose national industrial safety and health legislation, the federal government lacked an institutionalized inspection, enforcement, or insurance compensation basis for generating statistics. In this statutory vacuum it was only appropriate that laissez faire guided data collection as well as the labor market. As a symbolic remnant of the divergent national paths to industrial injury prevention, the *Statistical Abstract of the United States* continues to report the number of "workers

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87. BUREAU OF LABOR STATISTICS, U.S. DEPT. OF LABOR, BULL. NO. 490: STATISTICS OF INDUSTRIAL ACCIDENTS IN THE UNITED STATES TO THE END OF 1927, at 1-10 (1929).

88. *Industrial Injuries in the United States, 1917 to 1932*, MONTHLY LAB. REV., Apr. 1934, at 1093, 1094 (vol. 38).

89. Max D. Kossoris & Swen Kjaer, *Industrial Injuries in the United States During 1936*, MONTHLY LAB. REV., Jan. 1938, at 18 (vol. 47).

90. BUREAU OF LABOR STATISTICS, U.S. DEPT. OF LABOR, BULL. NO. 667: MANUAL ON INDUSTRIAL INJURY STATISTICS 1 (1940).

91. On the NSC's ambivalence toward the slogan, *see* Dianne Bennett & William Graebner, *Safety First: Slogan and Symbol of the Industrial Safety Movement*, 68 J. ILL. STATE HIST. SOC'Y 243, 255-56 (1975).

92. BUREAU OF LABOR STATISTICS, U.S. DEPT. OF LABOR, BULL. NO. 304: PROCEEDINGS OF THE EIGHTH ANNUAL MEETING OF THE INTERNATIONAL ASSOCIATION OF INDUSTRIAL ACCIDENT BOARDS AND COMMISSIONS 63 (1922) (discussion contribution by A. J. Pillsbury, Comm'r, Cal. Indus. Accident Comm'n).

killed" in the section headed, "Labor Force, Employment, and Earnings,"[93] whereas the corresponding statistical compendia in Europe place these data under such rubrics as "Public Health," "Insurance," or "Social Conditions."[94]

Consistent with the voluntary character of the U.S. approach, from the 1930s until the enactment of OSHA, the generation of data on employment-related fatalities largely rested with a private organization, the NSC, which compiled such statistics as part of its overall "Safety First" accident prevention program. The NSC was chartered by an act of Congress in 1953,[95] four decades after it emerged from efforts by the murderous steel industry to manage its casualties and by big business in general to ward off even more costly and less predictable injury indemnification systems than workers' compensation laws.[96] For many years, the NSC has been the key organization in a private network designed to enable employers to preempt state intervention by voluntarily formulating and adopting their own safety and health standards. As "a captive of its member firms . . . it function[s] as a public relations agency and corporate think tank rather than an independent research body. [T]he NSC develop[s] and promote[s] preventive strategies that coincide[] with corporate control of production, personnel relations, and plant operations."[97]

The NSC based (and continues to base) its estimates of industrial fatality on death certificates compiled by the National Center for Health Statistics and annual reports by state registrars of vital statistics. Although death certificates "in theory" contain the information required to categorize all fatalities into the four classes (motor vehicle, work, home, and public) which form the NSC's universe of accidental death, "[i]n practice . . . missing or incompletely coded information prevents the direct use of death certificate data for determining the class totals" other than motor vehicles.[98] Moreover, the death certificates do not specify the industries in which the deaths occurred. In order to rectify this defect:

> From the late 1930's to the mid-60's a statistician from the Council would go to Washington in January or February of each year to meet with statisticians at . . .

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93. *See, e.g.*, U.S. BUREAU OF THE CENSUS, STATISTICAL ABSTRACT OF THE UNITED STATES: 1992, tbl. 665 at 419 (112th ed. 1992) (using NSC estimates). When the Census Bureau began publishing the BLS injury rates, it classified them among "labor force" data. U.S. BUREAU OF THE CENSUS, STATISTICAL ABSTRACT OF THE UNITED STATES: 1944-45, tbl. 172 at 171 (1945).

94. *See, e.g.*, MINISTÈRE DU TRAVAIL, ANNUAIRE STATISTIQUE—1922, at 149 (1923); CENTRAL STATISTICAL OFFICE, ANNUAL ABSTRACT OF STATISTICS 1992, tbl. 3.35 at 72; STATISTISCHES BUNDESAMT, STATISTISCHES JAHRBUCH 1976 FÜR DIE BUNDESREPUBLIK DEUTSCHLAND, tbl. 21.3.2 at 389 (1976); STATISTISK CENTRALBYRÅ, STATISTISK ÅRBOK 1991, tbl. 136 at 116 (1991); STATISTISKA CENTRALBYRÅN, STATISTISK ÅRBOK FÖR SVERIGE 1991, tbl. 370 at 323 (1991); BUNDESAMT FÜR STATISTIK, STATISTISCHES JAHRBUCH DER SCHWEIZ 1991, tbl. 13.9 at 262 (1990).

95. Act of Aug. 13, 1953, Pub. L. No. 259, 67 Stat. 569. This federal charter does not affect the NSC's nongovernmental status.

96. *See* Don D. Lescohier, *Working Conditions*, in 3 HISTORY OF LABOR IN THE UNITED STATES, 1896-1932, at 1, 366-70 (1935); DAVID BRODY, STEELWORKERS IN AMERICA: THE NONUNION ERA 164-68 (1960); Lawrence Friedman & Jack Ladinsky, *Social Change and the Law of Industrial Accidents*, 67 COLUM. L. REV. 50 (1967); JAMES WEINSTEIN, THE CORPORATE IDEAL IN THE LIBERAL STATE: 1900-1918, at 40-61 (1968); DAVID NOBLE, AMERICA BY DESIGN: SCIENCE, TECHNOLOGY, AND THE RISE OF CORPORATE CAPITALISM 289-92 (1977).

97. CHARLES NOBLE, LIBERALISM AT WORK: THE RISE AND FALL OF OSHA 43-45 (1986). *See also* JOSEPH PAGE & MARY-WIN O'BRIEN, BITTER WAGES: RALPH NADER'S STUDY GROUP REPORT ON DISEASE AND INJURY ON THE JOB 149-65 (1973); DANIEL BERMAN, DEATH ON THE JOB: OCCUPATIONAL HEALTH AND SAFETY STRUGGLES IN THE UNITED STATES 74-81 (1978).

98. NSC, ACCIDENT FACTS, 1993 EDITION, at 112.

> BLS . . . and other federal agencies collecting accident-related data. Together they would go over the latest information from BLS surveys, Council estimates, reports from Council members, and special studies, and they would agree on the work death total that both agencies would use. They would also agree on the distribution of those deaths among the major industry groups.[99]

The only light that the NSC chooses to shine into this densely black methodological box is a table showing what was apparently the last "reconciliation" between the NSC and the BLS in 1964. For the construction industry, where non-employees accounted for between a quarter and a fifth of all fatalities, the data were based on "small sample surveys" conducted by the BLS.[100] If this procedure was murky and suspected of including duplicate deaths, which rendered both absolute levels and year-to-year changes unreliable,[101] since the mid-1960s, when the BLS ceased furnishing the NSC with the annual benchmarks derived from BLS surveys, it has become impenetrable. This incomprehensibility is only enhanced by the procedure that the NSC devised to "allocate" deaths to the three non-motor vehicle classes. Called "the 3-Way Split," it applies a "set of allocation factors" to each combination of age-group and external cause of death derived from a survey of death certificates; developed in the 1930s, these factors were based on documentation which is no longer available to the NSC, although it asserts that a recent revision did not call for a re-estimation of total workplace deaths.[102]

The following colloquy between the president of the NSC and Harrison Williams, the chairman of the Senate Committee on Labor and Public Welfare, inadvertently highlighted the NSC's opaque methodology:

> The CHAIRMAN. You have some statistics here that we have been unable to get on the . . . numbers of deaths due to accident. Where do you get your statistics? The Labor Department doesn't have them?
>
> Mr. TOFANY. We get them from a variety of sources including the agencies of the Federal Government and private sector organizations, also from our own members. Our statisticians take these sources and the data that flows from them and correlate them. For example, the total number of deaths that happened into [sic] the country are broken down into categories as to cause of death. And to the extent they can apply that information, that works its way into the conclusions our statisticians reach.
>
> Thus, we have a wide variety of sources which we utilize to the extent that we can in order to develop the relationship of all of the data as it relies to a given accident area where we don't have the specific report, per se, and then——[103]

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99. NSC, DOCUMENTATION OF NATIONAL SAFETY COUNCIL STATISTICS DEPARTMENT ESTIMATING PROCEDURES FOR MOTOR-VEHICLE, WORK, HOME, AND PUBLIC DEATHS AND DEATH RATES 2, 7-8 (Feb. 1982).

100. NSC, *supra* note 99, at 8, Appendix 8.

101. U.S. CONGRESS, OFFICE OF TECHNOLOGY ASSESSMENT, PREVENTING ILLNESS AND INJURY IN THE WORKPLACE 31 (1985).

102. NSC, ACCIDENT FACTS, 1993 EDITION, at 112-13; [Stephanie Brand & Alan Hoskin], "Allocation Factor Investigation' (n.d. [1993]). *See also* U.S. OCCUPATIONAL SAFETY & HEALTH ADMIN., ANALYSIS OF CONSTRUCTION FATALITIES—THE OSHA DATA BASE 1985-1989, at 75 (1990) ("Although the same equations are still used, the original data giving the rationale is no longer available").

103. *Occupational Safety and Health Act Review, 1974: Hearings Before the Subcomm. on Labor of the Senate Comm. on Labor and Public Welfare*, 93d Cong., 2d Sess. 92-93 (1974).

One reason that Williams, arguably the staunchest congressional advocate of labor-protective legislation during the post-World War II period, failed to challenge or even to remark on this double talk may have been that the NSC's high industrial fatality figures provided ongoing justification for strengthening OSHA.[104] Although the BLS, in compliance with the Secretary of Labor's statutory duty to develop injury statistics under OSHA, began to operate under a scope of coverage and definitions which were incompatible with the NSC's, and despite the lack of any "other direct measures of fatality experience," the NSC has "continued to carry forward these estimates." For public consumption, the NSC contends "that this procedure is the most satisfactory now available."[105] Privately, however, the manager of the NSC's statistics department concedes that the NSC's annual estimates, cut off from periodic benchmarking, began to "deviate from reality" by the end of the 1970s. Moreover, the NSC continues to publish data on absolute levels of fatalities without caveats although the data for at least the last three decades reflect only year-to-year changes.[106]

This bewildering methodology is all the more bizarre given the NSC's eminently practical purposes as "the leader of the voluntary safety movement, integrating the views of management, labor, government, and the general public." After all, in order to spotlight growing problems and to deemphasize sources of accidents of decreasing importance, the NSC depends on "complete, consistent, comparable, unbiased, and current" data, which it contends are available through selection of sources and procedures that "maximize" such reliability.[107] The NSC's continued dissemination of data based on statistical adjustments that became obsolete almost three decades ago calls into question its claim that "[c]redibility" is one of its "hallmarks."[108] Similarly, the NSC's nonfatal injury statistics, collected voluntarily from member firms, are biased because those self-reporting firms compete for safety awards based on their own data.[109]

Despite their manifest defects, the NSC data remain the only long-term comprehensive series, and retain their political value as having furnished the most impressive statistical support that proponents of OSHA could muster. The NSC figures were, for example, the source of the congressional testimony by the president of the AFL-CIO Building and Construction Trades Department that more than 25,000 building tradesmen had been killed on the job during the 1960s.[110] Congress was also animated by the NSC's overall estimates of 2.2 million disabling injuries annually—which may have represented only one-fifth of the actual number[111]—and more than 14,000

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104. The NSC submitted a written supplement to its testimony to the committee, which merely stated that whereas the NSC "precisely tabulated" motor-vehicle deaths, it did not do so with regard to work, home, or public fatalities; it failed to explain its method for "estimating what the counts should be." *Occupational Safety and Health Act Review, 1974*, *supra* note 103, at 909, 910.

105. NSC, *supra* note 99, at 8.

106. Telephone interview with Alan Hoskin, NSC, Itasca, IL (Feb. 11, 1994, 11:00 a.m.). BERMAN, *supra* note 97, at 39, inverts the absurdity of the procedure by charging that the absolute figures "were given a spurious appearance of accuracy by the inclusion of annual percentage changes."

107. NSC, *supra* note 99, at 1.

108. Untitled and undated information sheet distributed by the NSC.

109. JEROME GORDON ET AL., INDUSTRIAL SAFETY STATISTICS: A RE-EXAMINATION 189-90 (1971).

110. *Occupational Safety and Health Act, 1970: Hearings Before the Subcomm. on Labor of the Senate Comm. on Labor and Public Welfare*, pt. 2, 91st Cong., 1st & 2d Sess. 1113 (1970).

111. NICHOLAS ASHFORD, CRISIS IN THE WORKPLACE: OCCUPATIONAL DISEASE AND INJURY 46 (1976). For alternative injury rate statistics showing a stable or declining trend in the pre-OSHA period, *see* W. VISCUSI, RISK BY CHOICE: REGULATING HEALTH AND SAFETY IN THE WORKPLACE 28-31

Table 1: Workers Killed in the United States, 1928-1992 (NSC)†

Year	Total	Construction	Year	Total	Construction
1928	19000	2600	1961	13500	2300
1929	20000	NA	1962	13700	2400
1930	19000	NA	1963	14200	2500
1931	17500	NA	1964	14200	2600
1932	15000	1800	1965	14100	2700
1933	14500	2300	1966	14500	2800
1934	16000	2300	1967	14200	2700
1935	16500	2500	1968	14300	2800
1936	18500	2800	1969	14300	2800
1937	19000	3100	1970	13800	2800
1938	16000	2700	1971	13700	2700
1939	15500	1800	1972	14000	2800
1940	17000	3100	1973	14300	2800
1941	18000	3300	1974	13500	2600
1942	18000	3100	1975	13000	2300
1943	17500	2400	1976	12500	2100
1944	16000	1800	1977	12900	2400
1945	16500	1700	1978	13100	2600
1946	16500	2200	1979	13000	2600
1947	17000	2400	1980	13200	2500
1948	16000	2500	1981	12500	2300
1949	15000	2100	1982	11900	2100
1950	15500	2300	1983	11700	2100
1951	16000	2500	1984	11500	2200
1952	15000	2400	1985	11500	2200
1953	15000	2500	1986	11100	2100
1954	14000	2400	1987	11300	2200
1955	14200	2500	1988	11000	2200
1956	14300	2600	1989	10900	2100
1957	14200	2500	1990	10100	2100
1958	13300	2400	1991	9300	1800
1959	13800	2500	1992	8500	1300
1960	13800	2400			

fatalities,[112] which may have been an overestimate. The role played by the NSC's data is ironic[113] in light of Ralph Nader's allegations at the 1969 OSHA hearings that

(1983).

† *Sources*: **Construction 1928**: R. Fortney & Alvan Battey, *Where the Fatalities Occurred in 1929*, NAT'L SAFETY NEWS, Feb. 1931, at 23, 24; **Total 1928-1992**: NSC, ACCIDENT FACTS 1993 EDITION 26-27 (1993); **Construction 1933-1992**: NSC, ACCIDENT FACTS (annually, 1933-1993)

112. NSC, ACCIDENT FACTS, 1973 EDITION 28 (1973).

113. For a (not very persuasive) explanation of a similar statistically inaccurate statement against

the NSC's injury frequency data are "widely recognized as incomplete, often inaccurate, and always unverified" and that "[t]he record of the National Safety Council is impressive in terms of misrepresenting the true safety record of its own members."[114]

The NSC series reveals an astounding total of 862,900 killed during the six decades from 1932 to 1992, 147,400 of whom worked in construction (table 1). Moreover, for the forty-five years following World War II, construction fatalities showed a stubbornly irreducible floor: from 1946 to 1990, annual fatalities moved within a very narrow range, never falling below 2,100 or rising above 2,800. This constancy may, however, at least since OSHA's enactment, have been a mere statistical artifact—a function of the fact that NSC has continued to moor its fatality data to an obsolete BLS benchmark. Among the 265,000 workers killed even under the aegis of OSHA, the 50,000 deaths in the construction industry figured prominently.

Joint Private-Public Underestimates

> Death entails a total cessation of labor power . . . .[115]

The BLS, too, published survey-based fatality data from 1936 on although the samples outside of manufacturing, mining, and railroads were so fragmentary that the BLS itself did not regard them as "satisfactorily representative." In construction, for example, the BLS went through the motions of extrapolating totals from a mere 148 establishments "because so little information is available . . . from any other source and . . . injury hazards . . . are known to be great."[116] The BLS gradually enlarged the samples, and as of 1937 began including self-employeds.[117] Exactly how it collected these sample data the BLS failed to reveal. It appears that until 1938, the BLS obtained the data from state workers' compensation boards, whereas from 1939 on it effected "a drastic change" by switching to voluntary direct reporting by employers.[118] Which source generated more underreporting the BLS did not note or perhaps even examine. By the early post-World War II period, fewer than a third of the construction firms from which the BLS requested data filed usable reports.[119] Such self-selection may well have resulted in undersampling of employers with the worst safety records and thus in underestimates of total fatalities.

These sampling problems notwithstanding, the BLS data appear in fact to have derived at least in part from the NSC tabulations although the BLS did not always make this connection clear. On the one hand, the BLS stated that its work-injury data

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interest—namely, Census Bureau data showing stagnation in real family income during the 1970s—*see* Christopher Jencks, *The Politics of Income Measurement*, THE POLITICS OF NUMBERS 83, 126-31 (William Alonso & Paul Starr eds. 1987).

114. *Occupational Health and Safety Act, 1970: Hearings Before the Subcomm. on Labor of the Senate Comm. on Labor and Public Welfare*, Pt. 1 at 630.

115. BUREAU OF LABOR STATISTICS, U.S. DEPT. OF LABOR, BULL. NO. 276: STANDARDIZATION OF INDUSTRIAL ACCIDENT STATISTICS 73 (1920).

116. Max Kossoris & Swen Kjaer, *Industrial Injuries in the United States During 1936*, MONTHLY LAB. REV., Oct. 1938, at 18, 26 (vol. 47).

117. Max Kossoris & Swen Kjaer, *Industrial Accidents in the United States During 1937*, MONTHLY LAB. REV., Oct. 1939, at 597, 599 (vol. 48).

118. Max Kossoris & Swen Kjaer, *Industrial Injuries in the United States During 1939*, MONTHLY LAB. REV., Oct. 1940, at 86, 89 (vol. 49).

119. BUREAU OF LABOR STATISTICS, U.S. DEPT. OF LABOR, BULL. NO. 1004: WORK INJURIES IN CONSTRUCTION, 1948-49, at 2-3 (1950).

were based on survey samples of voluntarily participating employers "computed by direct expansion to represent the probable volume of injuries in the total working population."[120] On the other hand, these data "also served the important internal function of supporting the estimates" of annual fatalities,[121] which, especially in the post-World War II years, were the same as the NSC's figures.[122] In 1951, the BLS revealed that since these estimates were "prepared cooperatively" by the two organizations, they were "identical."[123] As the U.S. Commissioner of Labor Statistics explained to the President's Conference on Occupational Safety in 1954 in a "quasi-dramatic presentation," because the BLS "cannot obtain anywhere a complete count of work injuries . . . the technical people" at the BLS and NSC "assemble all of these bits and pieces of work-injury data, fit them together like pieces in a jigsaw puzzle . . . match them up . . . and make adjustments so that the figures will be comparable."[124]

In 1966, shortly before the BLS broke off its cooperation with the NSC, it published its first *Handbook of Methods*, which managed to be almost as cryptic about their joint estimation procedures as the NSC. The annual data

> represent the combined judgment of the technical staffs of the two organizations based on a pooling of all data available to either group.
>
> In the absence of a centralized system of reporting work injuries in the United States, the accumulation of data providing national totals must be based upon the assembly of a many bits of data drawn from a wide variety of sources. These basic data frequently overlap or omit entirely certain segments of employment. Additional problems are introduced by a lack of uniformity in the reporting and compilation procedures of the organizations from which the basic data are obtained.[125]

After obliquely conceding that its methods could not be reproduced, checked, or verified, the BLS identified state workers' compensation agencies as the primary data sources although they failed to "meet current needs" because of variations in coverage and inadequate statistical procedures. The BLS therefore had recourse to organizations as heterogeneous as the Coast Guard and the Portland Cement Association to fill in the gaps. Ultimately, only the data for mining, manufacturing, and railroads were deemed "very comprehensive and . . . having a high degree of accuracy," whereas those for agriculture were "fragmentary . . . and may reflect a comparatively high degree of error."[126]

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120. BUREAU OF LABOR STATISTICS, U.S. DEPT. OF LABOR, BULL. NO. 1016: HANDBOOK OF LABOR STATISTICS, 1950 EDITION 175 (1951).

121. BUREAU OF LABOR STATISTICS, U.S. DEPT. OF LABOR, BULL. NO. 1458: HANDBOOK OF METHODS FOR SURVEYS AND STUDIES 205 (1966).

122. *See, e.g.*, BUREAU OF LABOR STATISTICS, U.S. DEPT. OF LABOR, BULL. NO. 916: HANDBOOK OF LABOR STATISTICS, 1947 EDITION, tbl. G-2 at 164 (1948); NSC, ACCIDENT FACTS, 1973 EDITION at 29; *supra* tbl. 1. Neither the BLS nor NSC explained why their fatality figures diverged for several years.

123. BUREAU OF LABOR STATISTICS, U.S. DEPT. OF LABOR, BULL. NO. 1025: WORK INJURIES IN THE UNITED STATES DURING 1949, at 1 n.3 (1951).

124. U.S. Bureau of Labor Standards, Bull. 175: THE PRESIDENT'S CONFERENCE ON OCCUPATIONAL SAFETY: PROCEEDINGS MAY 4-6, 1954, at 7-8 (1954) (Ewan Clague).

125. BUREAU OF LABOR STATISTICS, U.S. DEPT. OF LABOR, HANDBOOK OF METHODS FOR SURVEYS AND STUDIES 205.

126. *Id.* at 205, 206. From several statements it is possible to surmise that the fatality figures were not enumerations at all but merely derived from some observed patterns of deaths as a share of all injuries. Thus the BLS spoke in several places of the data as "the percent of disabling injuries result-

The preceding historical sketch of BLS-NSC cooperation with regard to the creation of industrial accident fatality data should be viewed in the context of the nationally uniform method that the BLS and employers jointly adopted in the 1930s for recording and reporting work injuries. Like the NSC-BLS methodology for fatal injuries, the American Standard Method of Measuring and Recording Work Injury Experience of the American National Standards Institute (ANSI) failed to create accurate data on nonfatal injuries. The ANSI Z16.1 standard inevitably underestimated injuries by excluding from the definition of the "day of disability" the day of injury and the day on which the injured worker returned to full-time work. This distortion, which vitiated all BLS injury data from the 1930s until the enactment of OSHA in 1970, was compounded by a system of voluntary reporting, which presumably biased the sample toward firms with low rates.[127] These methodological machinations formed the basis of Ralph Nader's charge at the OSHA hearings in 1969 that in the 1930s the BLS began intentionally to understate nonfatal accidents by acquiescing in industry's request that certain injuries be excluded and the sample be kept statistically insignificant in order to minimize the visibility of safety problems and industry's responsibility for them.[128] Under the more comprehensive OSHA standard, however, which includes injuries that require medical treatment beyond first aid but do not involve lost workdays, the number of recorded occupational injuries and illnesses more than tripled.[129]

The State Counts Too

> The Bureau of Labor Statistics at the request of OSHA doesn't know what the hell is going on . . . . We don't know how many people get killed in construction, much less injured, ill or otherwise.[130]

For the period since the enactment of OSHA, the BLS has issued an alternative series of annual "industrial battle bulletins, which enumerate the wounded and killed of the industrial army."[131] These data were, at least until the advent of the Census of Fatal Occupational Injuries for 1992, the quasi-official figures, which were included in the annual report which OSHA requires the President to transmit to Congress.[132] The

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ing in death, permanent impairment, and temporary-total disability." *Id.* at 197; *see also id.* at 198, 204.

127. UNITED STATES OF AMERICA STANDARDS INSTITUTE, USA STANDARD METHOD OF RECORDING AND MEASURING WORK INJURY EXPERIENCE 8 (1967), *reprinted in Occupational Safety and Health Act, 1970: Hearings Before the Subcomm. on Labor of the Senate Comm. on Labor and Public Welfare*, pt. 2 at 1181; COUNTING INJURIES AND ILLNESSES IN THE WORKPLACE at 12-13; Lyle Schauer & Thomas Ryder, *New Approach to Occupational Safety and Health Statistics*, MONTHLY LAB. REV., Apr. 1972, at 14 (vol. 95).

128. *Occupational Health and Safety Act, 1970: Hearings Before the Subcomm. on Labor of the Senate Comm. on Labor and Public Welfare*, pt. 1 at 628.

129. BUREAU OF LABOR STATISTICS, U.S. DEPT. OF LABOR, BULL. NO. 1798: OCCUPATIONAL INJURIES AND ILLNESSES BY INDUSTRY: JULY 1-DECEMBER 31, 1971, at 25, 31 (1973); NSC, ACCIDENTS FACTS, 1973 EDITION 33.

130. *Construction Safety, Health and Education Improvement Act of 1989: Hearing Before the Senate Comm. on Labor and Human Resources*, 101st Cong., 1st Sess. 106 (1989) (testimony of Barry Cole, manager, construction safety consulting firm). This ignorance did not prevent Senator Dodd from calculating at the same hearing that "every 2 hours, three construction workers" are killed. *Id.* at 2.

131. 3 KARL MARX, DAS KAPITAL: KRITIK DER POLITISCHEN ÖKONOMIE, in 25 KARL MARX [&] FRIEDRICH ENGELS, WERKE 99 (1967).

132. *See, e.g.*, THE PRESIDENT'S REPORT ON OCCUPATIONAL SAFETY AND HEALTH 1975, tab. 14 at 108 (1979). The statutory authority is at 29 U.S.C. § 675 (1988).

data that the BLS has collected for the Occupational Safety and Health Administration ("OSHAdm") since the second half of 1971 are based on mail surveys of covered employers. Firms, which have no legal duty to respond, report the recordable injuries and illnesses—fatalities, other lost workday cases, and non-lost workday cases resulting in "transfer to another job or termination of employment," or involve "loss of consciousness or restriction of work or motion"[133]—that they are statutorily required to enter into their OSHA logs, although one-quarter fail to comply with that obligation or underrecord and underreport injuries.[134]

The BLS itself has obliquely pointed to the key weakness of its data collection procedure—namely, that the logs "reflect the year's injury and illness experience, *and also* the employer's understanding of the types of cases to record under current recordkeeping guidelines."[135] Yet in order to preserve confidentiality and maintain voluntary participation, the BLS neither validates these reports at the workplace nor shares them with the OSHAdm for inspection and compliance purposes.[136] The BLS's sampling system of unmonitored employer self-reporting prompted occupational medicine and public health scholars to criticize the Bureau's single-source-generated fatality figures as "grossly underreported."[137]

An effective health and safety surveillance program would encompass mass processing and auditing of the logs by the OSHAdm on a scale at least comparable to the Internal Revenue Service's treatment of self-reported income tax forms. But just as Congress has provided for checks on taxpayer truthfulness by requiring employers, banks, and other payors to file corroborating forms, mandating joint maintenance of the logs by unions or other worker representatives would reduce the frequency of self-serving understatements by employers. The effectiveness of the resulting set of accurate statistics would also be significantly enhanced if they were published for each firm[138] so that current and prospective employees would at least have the requisite information for making rational decisions as to where to work, how high their wages should be, and whether changes in working conditions are appropriate.

OSHA, however, is merely a mandatory recordkeeping, not a mandatory reporting system.[139] Indeed, so far removed is OSHA from such a strict regime that an employer, whose only obligation is to make the logs available to the Department of Labor on request,[140] can—without being sanctioned for filing a frivolous claim[141]—judicially challenge the Department's power even to inspect those logs.[142]

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133. 29 C.F.R. § 1904.12(c) (1993).

134. 29 C.F.R. § 1904.2(a) (1993); Paul Seligman et al., *Compliance with OSHA Record-keeping Requirements*, 78 AM. J. PUB. HEALTH 1218 (1988); U.S. GAO, OCCUPATIONAL SAFETY & HEALTH: ASSURING ACCURACY IN EMPLOYER INJURY AND ILLNESS RECORDS 3 (1988).

135. BUREAU OF LABOR STATISTICS, U.S. DEPT. OF LABOR, BULL. NO. 2399: OCCUPATIONAL INJURIES AND ILLNESSES IN THE UNITED STATES BY INDUSTRY, 1990, at 1 (1992) (italics added).

136. Eileen McNeely, *Who's Counting Anyway? The Problem with Occupational Safety and Health Statistics*, 33 J. OCCUPATIONAL MED. 1071 (1991).

137. Anthony Suruda & Edward Emmett, *Counting Recognized Occupational Deaths in the United States*, 30 J. OCCUPATIONAL MED. 868 (1988).

138. *See* 2 WOLFGANG DÄUBLER, DAS ARBEITSRECHT: EIN LEITFADEN FÜR ARBEITNEHMER 127 (1979).

139. While continuing to acknowledge BLS's need for confidentiality, the OSHA has proposed moving in the direction of having employers make the logs available to the OSHA and the public. U.S. GAO, OCCUPATIONAL SAFETY AND HEALTH: CHANGES NEEDED IN THE COMBINED FEDERAL-STATE APPROACH 36, 69 (1994); DAILY LAB. REP., Mar, 23, 1994 (Lexis).

140. 29 U.S.C. § 657(c) (1) (1988); 29 C.F.R. § 1904.7(a) (1993).

141. FED. R. CIV. P. 11.

Moreover, a change in the OSHAdm's enforcement policy gave manufacturing employers a considerable incentive to underreport injuries on their logs. Beginning in 1981, OSHAdm inspectors terminated on-site general schedule (random) inspections as soon as they determined, based on the employer's logs, that the firm's lost work-day injury rate (excluding fatal injuries) was lower than the national average for manufacturing.[143] Such underreporting of lost workdays stems from the widespread practice among employers of "keeping 'the walking wounded' on the job," which less than subtly informs workers that "non-lost-time accidents and first aid accidents are expected" as a matter of course.[144]

The close connection between conceptually deficient accident/injury statistics and prevention is captured by the incompatibility between the construction industry's programmatic approach to safety and OSHA's data reporting system. The Associated General Contractors of America, a large trade organization, made this commonsensical observation in its construction accident prevention manual almost seventy years ago: "An accident is an unintentional interruption to an orderly process—a turning aside of an intended procedure. The injury to persons is only the evidence of an accident."[145] Yet under OSHA, employers are not required to report even major accidents provided that no one is injured.[146] The absurdity of this type of nonreporting was underscored when twenty-eight construction workers died in 1987 as a result of a building collapse in Bridgeport, Connecticut. The same firm that was building L'Ambiance Plaza had previously built Metro Center, thirty miles away, which also collapsed, but because only one worker suffered an injury—the threshold for reporting within 48 hours is a fatality or five injuries[147]—the firm was not required to report it.[148] If OSHAdm had been notified of this previous major construction failure, "we're pretty certain that L'Ambiance never would have occurred."[149]

For the period July 1, 1971 through 1991, the BLS-OSHA series estimated a total of 88,430 fatalities (table 2).[150] This figure significantly understated workplace deaths because after 1977 the BLS published fatality data only for establishments with eleven or more employees.[151] The BLS limited the scope of the survey because it reduced the sample by 85,000 "in response to the Presidential directive on reduction of the paperwork burden in survey operations. The sample reduction results in larger

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142. *See, e.g.*, Dole v. Trinity Industries, 904 F.2d 867 (3d Cir. 1990).

143. *OSHA Enforcement Policy: Hearings Before a Subcomm. of the House Comm. on Government Operations*, 98th Cong., 1st Sess. 13 (1983) (statement of Thorne Auchter, ass't sec'y of labor for OSH); COUNTING INJURIES AND ILLNESSES IN THE WORKPLACE at 47-48, 111-12; LAWRENCE WHITE, HUMAN DEBRIS: THE INJURED WORKER IN AMERICA 153 (1982).

144. RAYMOND LEVITT & NANCY SAMELSON, CONSTRUCTION SAFETY MANAGEMENT 152 (1987).

145. ASSOCIATED GENERAL CONTRACTORS OF AMERICA, INC., MANUAL OF ACCIDENT PREVENTION IN CONSTRUCTION x (3d ed. 1949 [1927]).

146. *But see* 1 INT'L LAB. OFFICE, ENCYCLOPAEDIA OF OCCUPATIONAL HEALTH AND SAFETY at 14 (discussing such a requirement).

147. 29 C.F.R. § 1904.8 (1993).

148. Clifford May, *Record Fines Are Imposed in Building Collapse That Killed*, N.Y. TIMES, Oct. 23, 1987, at B1.

149. *Legislative Hearings on the Construction Safety, Health, and Education Improvement Act of 1990: Hearings Before the Subcomm. on Health and Safety of the House Comm. on Education and Labor*, 101st Cong., 2d Sess. 10-11 (1990) (Rep. Shays).

150. *See infra* table 2. This figure includes illness fatalities for which the BLS published separate totals for the years 1971 to 1973.

151. Diane Cotter & Janet Macon, *Death in Industry, 1985: BLS Survey Findings*, MONTHLY LAB. REV., Apr. 1987, at 45, 47.

sampling errors in the fatality data (statistically rare occurrences), making year-to-year comparisons for this group of small employers of questionable reliability."[152] Based

Table 2: Workers Killed in the United States, 1971-1991 (BLS-OSHA)†

Year	Total	Construction	Year	Total	Construction
1971	4200*	800*	1982	4090	720
1972	5500	1500	1983	3100	670
1973	5700	1000	1984	3740	660
1974	5900	1200	1985	3750	980
1975	5300	1000	1986	3610	670
1976	4500	800	1987	3400	820
1977	4760	NA**	1988	3270	850
1978	4590	925	1989	3600	780
1979	4950	960	1990	2900	700
1980	4400	839	1991	2800	500
1981	4370	800			

*Covered only July 1-Dec. 31

**BLS did not publish industry-level fatality data in 1977.††

on estimates of annual fatalities among employing units with 10 or fewer employees for the years prior to 1977, the BLS suggested that 800 fatalities be added to the totals for later years.[153] Making this adjustment for the 15 years from 1977 to 1991 would add 12,000 deaths, bringing the total for the 19.5 years of the survey to almost exactly 100,000 fatalities.

Because a recent study shows that the exclusion of small firms may be a greater source of underestimation than previously recognized, the BLS's small-firm adjustment is almost certainly insufficient. A computer analysis of 500,000 safety-inspection re-

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152. BUREAU OF LABOR STATISTICS, U.S. DEPT. OF LABOR, BULL. NO. 2047: OCCUPATIONAL INJURIES AND ILLNESSES IN THE UNITED STATES BY INDUSTRY, 1977, at 5 (1980).

† *Sources*: **1971-1973**: U.S. BLS, Bull. 1798: OCCUPATIONAL INJURIES AND ILLNESSES BY INDUSTRY: JULY 1 - DECEMBER 31, 1971, tab. 4 at 13 (1973); U.S. BLS, Bull. 1830: OCCUPATIONAL INJURIES AND ILLNESSES BY INDUSTRY, 1972, tab. 5 at 66 (1974); U.S. BLS, Bull. 1830: OCCUPATIONAL INJURIES AND ILLNESSES BY INDUSTRY, 1973, tab. 6 at 73 (1975); **1974-1977**: U.S. BLS, Rep. 460: CHARTBOOK ON OCCUPATIONAL INJURIES AND ILLNESSES, 1974, tab. 4 at 25 (1976); U.S. BLS, Rep. 501: CHARTBOOK ON OCCUPATIONAL INJURIES AND ILLNESSES, 1975, tab. 3 at 30 (1977); U.S. BLS, Rep. 535: CHARTBOOK ON OCCUPATIONAL INJURIES AND ILLNESSES, 1976, tab. 4 at 32 (1978) **1978-1991**: U.S. BLS, Office of Safety, Health, & Working Conditions (Feb. 7, 1994) (furnished to author).

†† BLS offered no express reason for its omission of industry-level fatalities for 1977 or for its resumed publication of such data in 1978. U.S. BLS, Bull. 2078: OCCUPATIONAL INJURIES AND ILLNESSES IN THE UNITED STATES BY INDUSTRY, 1978, at 6-7 (1980).

153. BUREAU OF LABOR STATISTICS, U.S. DEPT. OF LABOR, BULL. NO. 2047: OCCUPATIONAL INJURIES AND ILLNESSES IN THE UNITED STATES BY INDUSTRY, 1977, at 5 (1980). For descriptions of the scope of the surveys earlier in the 1970s, *see* BUREAU OF LABOR STATISTICS, U.S. DEPT. OF LABOR, Rep. 438: OCCUPATIONAL SAFETY AND HEALTH STATISTICS: CONCEPTS AND METHODS (1975); BUREAU OF LABOR STATISTICS, U.S. DEPT. OF LABOR, Rep. 518: OCCUPATIONAL SAFETY AND HEALTH STATISTICS: CONCEPTS AND METHODS (1978).

cords by the *Wall Street Journal* revealed that from 1988 to 1992, 4,337 workers died at workplaces with fewer than twenty employees, whereas only 127 died at those with more than 2,500 employees. The ratio of the fatality rates in the two groups was almost 500 to 1.[154]

For construction alone, the BLS-OSHA surveys showed 17,174 deaths for these two decades or almost one-fifth of all fatalities (table 2). The annual average of about 880 was little more than a third of the 2,300 annual fatalities recorded by the NSC for the same period.[155] This discrepancy has in part been explained by a controlled experiment, which revealed a cluster of non-reporting of fatalities to the OSHA among construction firms.[156] In addition, whereas the NSC does not discriminate against dead self-employeds, OSHA covers only employees.[157] Despite all these flaws, an OSHA contractee certified the BLS survey as "the only reliable national measure of occupational injury and illness."[158]

A third fatality data base is built on the work-related deaths that employers are required to report to the OSHAdm.[159] These fatalities have run considerably higher than the BLS figures. The 4,792 construction deaths reported to OSHAdm from 1985 through 1989 exceed the BLS survey results by 17 percent.[160] The discrepancy is to be expected given the BLS survey's many exclusions. By the same token, however, both OSHA and BLS data are underestimates because firms may underreport, and neither agency's reports include the formally self-employed, who are numerous in construction, or workers not covered by OSHA or covered by other safety legislation.[161] By using death certificates and medical examiner records, researchers have discovered that OSHA fatality reports capture only one-third of all occupational injury deaths.[162] Death certificates alone, however, also underestimate total occupational fatalities.[163]

Yet a fourth estimate of fatalities is derived from the National Institute for Occupational Safety and Health ("NIOSH") National Traumatic Occupational Fatalities ("NTOF") surveillance system for the years 1980 to 1989. Based on death certificates from state vital statistics agencies which are estimated as identifying 80 percent of work-related fatalities, NTOF reported 11,417 construction fatalities during the 1980s. The annual average of 1,142 deaths is about 50 percent and 20 percent higher than the

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154. The rates were 1.97 and 0.004 per 1,000 workers respectively. Barbara Marsh, *Chances of Getting Hurt Is Generally Far Higher at Smaller Companies*, WALL ST. J., Feb. 3, 1994, at A1. According to OSHA data, 45 percent of all construction fatalities occur in workplaces with 25 or fewer employees. S. REP. NO. 558: CONSTRUCTION SAFETY, HEALTH, AND EDUCATION IMPROVEMENT ACT, 101st Cong., 2d Sess. 6 (1990).

155. An intermediate figure comes from a labor group estimation that three to four construction workers are killed daily. WALL ST. J., Feb. 22, 1994, at A1.

156. COUNTING INJURIES AND ILLNESSES IN THE WORKPLACE at 56-60, 145, 148-49.

157. 29 U.S.C. §§ 652(6), 654 (1988).

158. Norman Root & David McCaffrey, *Providing More Information on Work Injury and Illness*, MONTHLY LAB. REV., Apr. 1978, at 16, 21 n.2 (citing 1976 Stanford Research Institute report).

159. 29 C.F.R. § 1904.8 (1993).

160. U.S. OSHA, ANALYSIS OF CONSTRUCTION FATALITIES at 3. The BLS data reported by OSHA are for some years identical with but for other years differ from those furnished by BLS itself. *Id.* at 53, 56.

161. *Id.* at 51-55.

162. Nancy Stout & Catherine Bell, *Effectiveness of Source Documents for Identifying Fatal Occupational Injuries: A Synthesis of Studies*, 81 AM. J. PUB. HEALTH 725 (1991).

163. Julie Russell & Carol Conroy, *Representativeness of Deaths Identified Through the Injury-at-Work Item on the Death Certificate: Implications for Surveillance*, 81 AM. J. PUB. HEALTH 1613 (1991).

BLS and OSHA figures respectively, and about one-half of the NSC total. According to the NTOF study, the fatal injury rate in construction during the 1980s, 25.6 per 100,000 full-time workers, was almost four times the all-industry average.[164] One of the principal reasons for the discrepancy between the NTOF data on the one hand and the BLS/OSHA on the other is the former's inclusion of the nominally self-employed.[165]

A Census of Death Comes to Life

> There is no "gold standard" for counting the number of work-related . . . injury deaths.[166]

Thus despite many years of intensive public-private cooperation, estimates of total work-related deaths have varied widely, with the NSC's figures exceeding those of the BLS by a factor of three.[167] As late as the 1980s, medical researchers confirmed that "a complete series of fatal occupational work injuries (all those in a specified time period for a defined population or geographic area) has never been described. In large part, this is because no single source of data permits easy identification of all cases."[168]

The BLS itself "had doubts about the quality" of its own annual estimates of fatalities. One key flaw in the data, as a Government Accounting Office study revealed, was, predictably enough, employers' unpoliced underestimates of injuries as recorded on their OSHA logs.[169] The BLS therefore commissioned a study in the mid-1980s by the National Research Council, which "found it rather startling that an agreed-upon method has not been devised to estimate a phenomenon as basic as traumatic death in the [American] workplace."[170] Since the BLS excluded from its annual survey entities employing fewer than eleven employees and accounting for one-third of total employment, it is unclear why the BLS was startled by this finding—especially since its methodology has otherwise been subject to sharp attack.[171]

Years of critique and self-critique finally resulted in a new approach, which broke both with surveys based on employer self-reporting and with methodologically inscrutable estimates. Twenty-three years after OSHA's enactment, the BLS published the first national Census of Fatal Occupational Injuries with data for 1992. Relying on multiple sources such as death certificates, reports by coroners and medical examiners,

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164. Suzanne Kisner & David Fosbroke, *Injury Hazards in the Construction Industry*, 36 J. OCCUPATIONAL MED. 137 (1994).

165. Nancy Stout-Wiegand, *Fatal Occupational Injuries in US Industries, 1984: Comparison of Two National Surveillance Systems*, 78 AM. J. PUB. HEALTH 1215, 1216 (1988).

166. Suruda & Emmett, *supra* note 137, at 870.

167. Guy Toscano & Janice Windau, *Further Test of a Census Approach to Compiling Data on Fatal Work Injuries*, MONTHLY LAB. REV., Oct. 1991, at 33.

168. Susan Baker et al., *Fatal Occupational Injuries*, 248 J. AM. MED. ASS'N 692 (1982).

169. U.S. GAO, OCCUPATIONAL SAFETY AND HEALTH: ASSURING ACCURACY IN EMPLOYER INJURY AND ILLNESS RECORDS (HRD-89-23, 1988).

170. COUNTING INJURIES AND ILLNESSES IN THE WORKPLACE at 6. *See also* "News Conference with Robert Reich, Secretary of Labor, and William Barron, Acting Commissioner of the Bureau of Labor Statistics," Fed. News Serv., Oct. 1, 1993 (Lexis) (statement by Barron).

171. *See e.g.*, Arthur Oleinick et al., *Current Method of Estimating Severity for Occupational Injuries and Illnesses: Data from the 1986 Michigan Comprehensive Compensable Injury and Illness Database*, 23 AM. J. INDUS. MED. 231 (1993); Arthur Rubens, *Workplace Statistics Can't Cut to the Heart*, OCCUPATIONAL HEALTH AND SAFETY, Aug. 1993, at 64.

and autopsy, workers' compensation, OSHA, state motor vehicle, and news media reports, the Census aspires to be a complete enumeration, the accuracy of which is supposed to be secured by the requirement that a fatality be identified by at least two sources. In keeping with the comprehensive scope of the Census, its aggregate fatality figure of 6,083 includes 1,216 workplace homicides and suicides. Since the NSC's focus on "accidental deaths" excludes such acts, the 4,867 non-intentional fatalities counted by the Census amounted to only 57 percent of the NSC's total of 8,500 for 1992, whereas the 903 enumerated construction fatalities fell 30 percent short of the NSC figure.[172]

This discrepancy suggests either that the Census is less than comprehensive or that the NSC, despite its reputation as a tool of big business, has been exaggerating industrial fatalities. Those responsible for compiling the NSC and Census fatality statistics tentatively agree that the correct figure lies somewhere between the two. They believe, for example, that the Census may be missing work-related transportation fatalities that involve vehicles that are not obviously identifiable to the police or medical authorities as having been driven by workers in the course of their employment. Where, in addition, the dead were nonemployees, who are statutorily excluded from workers' compensation, or were for any other reason outside the scope of such state programs, neither a death certificate nor workers' compensation report would identify such fatalities.[173]

As these enumeration problems demonstrate, the recent intensification of efforts by employers to treat workers as nonemployees in order to lower costs[174] may also be contributing to an underreporting of industrial fatalities. Although it may be unclear how a dead self-employee would comply with a statutory duty to record and notify the OSHA of his own death, the exclusion of alleged nonemployees from OSHA and workers' compensation programs makes even less sense than it does under other labor-protective regimes,[175] especially in construction, where the formally self-employed

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172. Guy Toscano, *The BLS Census of Fatal Occupational Injuries*, COMPENSATION & WORKING CONDITIONS, June 1991, at 1; Guy Toscano & Janice Windau, *Fatal Work Injuries: Results from the 1992 National Census*, MONTHLY LAB. REV., Oct. 1993, at 39, tab. 6 at 45; Tracy Jack & Mark Zak, *Results from the First National Census of Fatal Occupational Injuries, 1992*, COMPENSATION AND WORKING CONDITIONS, Dec. 1993, at 1; Janice Windau & Guy Toscano, *Workplace Homicides in 1992*, COMPENSATION & WORKING CONDITIONS, Feb. 1994, at 1, tab. 1 at 3; NSC, ACCIDENT FACTS, 1993 EDITION, at 27. The BLS later identified an additional 134 fatalities for 1992, raising the total to 6217. The total for 1993 is 6271. U.S. BLS, National Census of Fatal Occupational Injuries, 1993 (news release 94-384, Aug. 10, 1994).

173. Telephone interview with Alan Hoskin, manager, Statistics Dept., NSC, Mar. 23, 1994; telephone interview with Guy Toscano, Office of Safety, Health, and Working Conditions, BLS, Mar. 23, 1994; NSC, ACCIDENT FACTS, 1993 EDITION, at 39.

174. *See, e.g.*, Daniel Forbes, *The Growing Ranks of Contract Workers*, DUN'S BUSINESS MONTH, Mar. 1986, at 56; Louis Uchitelle, *Newest Corporate Refugees: Self-Employed But Low-Paid*, N.Y. TIMES, Nov. 15, 1993, at A1; Marc Linder & Larry Zacharias, *Opening Coase's Other Black Box: Why Workers Submit to Vertical Integration into Firms*, 18 J. CORP. L. 371 (1993); Andrea Gerlin, *Spread of Illegal Home Sewing Is Fueled by Immigrants*, WALL ST. J., Mar. 15, 1994, at B1; Robert Pear, *Clinton Health Care Plan Poses Question, 'Who Is an Employee?'*, N.Y. TIMES, Apr. 4, 1994, at A1.

175. A half-century ago Congress considered a comprehensive "Workers' Social Insurance Act," which would not only have included self-employeds, but even conferred guaranteed annual incomes on them. *Social Insurance: Hearings Before the Senate Committee on Education and Labor*, 74th Cong., 2d Sess. 1-12 (1936). For an excellent overview of arguments in favor of equalization of treatment of self-employeds and employees in social insurance programs based on the former's equally insecure position as sellers of their labor power, *see* Olaf Sund, *Die Sozialpolitik für Selbständige*, in

"often work on multi-employer projects and, therefore, can affect the safety and health of other construction workers."[176]

The most startling revelation of the Census is that highway accidents and homicides were the leading causes of occupational injury-fatalities, accounting for 18 and 17 percent respectively of the total of 6,083 deaths.[177] More specifically, the Census found that highway accidents were the leading cause of death for male workers while homicides were the leading cause of death for women workers nationwide, for all workers in New York City, and for certain occupations such as taxi drivers.[178]

The data on female workers show that the traditional discrimination against and underrepresentation of women in such dangerous industries as construction, mining, agriculture, transportation, and even certain manufacturing occupations have largely spared them stereotypical industrial death and given a new dimension to *femme fatale*. This finding mirrors earlier research on nonfatal injuries that showed that although women who work in predominantly male occupations experienced injury rates similar to men's, their concentration in less dangerous occupations produced significantly lower overall injury rates.[179] If women accounted for only one percent of industrial fatalities in the United Kingdom at the turn of the century and only two percent in the United States in 1913,[180] by the time of the 1992 Census they still accounted for only 7 percent. Thus although there are almost as many women in the work force as men, the latter account for more than 13 times as many fatalities as the former. The 172 female homicide victims represented one-sixth of all murdered workers and two-fifths of all female fatalities, whereas the 254 women who died from non-homicidal injuries accounted for only 5 percent of such fatalities.[181] A similar pattern of gender-specific violence had already emerged from the NIOSH NTOF surveillance system during the 1980s. Of the 63,589 workers identified as having succumbed to fatal occupational injuries from 1980 to 1989, only 6 percent were women; of these women, 41 percent were victims of homicides compared to only 10 percent among men.[182]

SOZIALPOLITIK UND SOZIALREFORM: EIN EINFÜHRENDES LEHR- UND HANDBUCH DER SOZIALPOLITIK 167 (Erik Boettcher ed. 1957).

176. *Legislative Hearings on the Construction Safety, Health, and Education Improvement Act of 1990* at 35 (testimony of Robert Georgine, president, Building & Construction Trades Dept., AFL-CIO). *See also* SAFETY AND HEALTH AT WORK: REPORT OF THE COMMITTEE 1970-72, at 55 ("There may . . . be situations where groups of self-employed persons may be to all intents and purposes in the same position as employees as regards their methods and conditions of work, that is to say their methods of work and working environment may not be within their direct control").

177. Guy Toscano & Janice Windau, *Fatal Work Injuries: Results from the 1992 National Census*, MONTHLY LAB. REV., Oct. 1993, at 39, tbl. 2 at 41.

178. Catherine Bell, *Female Homicides in United States Workplaces, 1980-1985*, 81 AM. J. PUB. HEALTH 729 (1991); Jess Kraus, *Homicide While at Work: Persons, Industries, and Occupations at High Risk*, 77 AM. J. PUB. HEALTH 1285 (1987); Harold Davis, *Workplace Homicides of Texas Males*, 77 AM. J. PUB. HEALTH 1290 (1987).

179. Norman Root & Judy Daley, *Are Women Safer Workers? A New Look at the Data*, MONTHLY LAB. REV., Mar. 1981, at 3.

180. Hoffman, *supra* note 28, at 421 (U.K. data for 1895-1906); BUREAU OF LABOR STATISTICS, U.S. DEPT. OF LABOR, BULL. NO. 157: INDUSTRIAL ACCIDENT STATISTICS, tbl. 1 at 6 (U.S. data).

181. Guy Toscano, "1992 Census of Fatal Occupational Injuries: Safer and Healthier American Workplaces Through Improving Knowledge" (Presentation at Occupational Safety and Health State Plan Association Meeting, Washington, D.C., Jan. 30-Feb. 2, 1994). Female homicide victims in technical, sales, and administrative support occupations—which were the principal locus of workplace murders—accounted for one-half of all female homicides and more than one-quarter of all homicides in those occupations. Unpublished data furnished by U.S. BLS (Mar. 17, 1994); Windau & Toscano, *supra* note 172, tbl. 3 at 5.

182. NIOSH, FATAL INJURIES TO WORKERS IN THE UNITED STATES, 1980-1989, at 4. *See also*

Safety and Profit: Zero-Sum Game?

> As soon as the idea roots itself . . . that there are no industrial accidents, we shall begin to get full statistics of injuries. Working people speak of industrial injuries—they speak of murder . . . . Are we not foolish to talk of industrial accidents in a world governed by law, we who are all servants of modern science . . . ? There is one . . . figure which serves to symbolize the statistics of industrial injuries to working people—the symbolic figure of Greed.[183]

These patterns create the impression that the hazards of the workplace merely reflect those of an increasingly and randomly dangerous world at large.[184] Indeed, homicides at work may, ironically, seem even more random that non-workplace homicides since most of the latter are committed by family members or acquaintances and relatively few in association with the commission of another felony, whereas most workplace homicides are committed by strangers in connection with robberies.[185] Media interpretation of such findings is continuous with the tradition that tends to view the place of employment not as a crucible of antagonistic class relationships but as a locus of societally indifferent individualized human interest stories.[186]

These phenomena and the sudden prominence that the news media, which otherwise devote little space to run-of-the-mill non-mass industrial fatalities, have conferred on them divert attention from the failure of the existing political-economic system to impose on firms liability costs in excess of injury prevention costs[187] or to incarcerate employers whose operations cause mass fatalities. Thus in 1988, after 18 years of OSHA and an additional 200,000 fatalities (as estimated by the NSC), the House Committee on Government Operations published a report entitled, *Getting Away with Murder in the Workplace: OSHA's Nonuse of Criminal Penalties for Safety Violations*.[188] Even though "[t]he penalty for removing a tag from a mattress is higher than"[189] the weak criminal sanctions under OSHA against employers whose willful violation of a standard causes an employee's death,[190] "[n]o jail term ha[d] ever been meted out in

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Catherine Bell, *Fatal Occupational Injuries in the United States, 1980 Through 1985*, 262 JAMA 3047 (1990).

183. Florence Kelley, *Our Lack of Statistics*, 38 ANNALS AM. ACAD. POL. & SOC. SCI. 94, 97 (1911).

184. "Dangerous weapons and dangerous people are offered greater Constitutional protection than most hazards in our environment." *Murder at Work*, 77 AM. J. PUB. HEALTH 1273 (1987) (editorial).

185. Dawn Castillo & E. Jenkins, *Industries and Occupations at High Risk for Work-Related Homicide*, 36 J. OCCUPATIONAL MED. 125 (1994); Windau & Toscano, *supra* note 172, tbl. 8 at 8. Some workplace homicides, especially those by subordinates against supervisors, may be (dangerous) employment-related. Thus a workers' compensation referee ruled that a black automobile worker's preexisting but nondisabling tendency toward paranoia had been "aggravated by his being unfairly assigned undesirable work in front of a hot oven, cheated out of advancement opportunities, addressed by a foreman as 'nigger' and 'boy,' denied medical benefits, . . . and, finally, fired after refusing to do a job he considered dangerous." *Michigan Rules Chrysler Must Pay Benefits to Man Who Killed* 3, WALL ST. J., Mar. 7, 1973, at 22.

186. *See, e.g.*, Matthew Purdy, *Workplace Murders Provoke Lawsuits and Better Security*, N.Y. TIMES, Feb. 14, 1994, at A1.

187. Harry M. Philo, *Revoke the Legal License to Kill Construction Workers*, 19 DE PAUL L. REV. 1 (1969); *To Promote Health and Safety* at 38-76 (testimony of Harry Philo).

188. H.R. REP. NO. 1051, 100th Cong., 2d Sess. (1988).

189. *OSHA Penalties and Procedures: Hearing Before the Subcomm. on Labor of the Senate Labor & Human Resources Comm.*, 101st Cong., 2d Sess. 8 (S. Hrg. 101-390, 1990) (Rep. Lantos).

190. 29 U.S.C. § 666(e) (1988) (imprisonment of no more than 6 months or 1 year for repeat

a criminal case arising from an OSHA investigation into the death of a worker."[191] Not until 1989 did the first and only employer serve time (45 days) in prison for violating OSHA.[192]

Overall a sea change in discourse has taken place in the quarter-century since OSHA's enactment, when legislative advocates stressed the NSC's estimates of 140,000 industrial fatalities during the 1960s in order to conjure up images of satanic mills.[193] With the shift in employment away from the primary and secondary sectors of material production—only one-third of Census fatalities in 1992 occurred at industrial places, in mines, or on farms[194]—to the tertiary sector comprising less manual, bureaucratic service work, where the bulk of workplace homicides are committed, public attention is no longer directed to the thousands of construction workers who are "electrocuted, buried alive, crushed, or fall to their death"[195] or to the laborers whose accumulated lifetime of exposure to unhealthful conditions has led to an average age of death of 62.[196] Instead, the press concentrates on NIOSH alerts concerning the homicidal risk exposure of those who work alone exchanging money with the public at night in high-crime areas.[197]

This much more diffuse etiology deflects attention from the divergence between social and private costs, which underlies firms' failure to take adequate safety precautions. One particularly poignant example of such profit-maximizing and injury-inducing entrepreneurial strategies is the expansion of output and reduction of unit costs through imposition of overtime and speed-ups on unskilled, low-paid workers, who then become fatigued.[198] In construction, today even more so than in the 1920s, "[m]oney

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offenders).

191. Robert D. McFadden, *U.S. Won't Bring Criminal Charges in Building Collapse in Which 28 Died*, N.Y. TIMES, Nov. 20, 1988, at 38. On the failure of the U.S. Dept. of Justice vigorously to prosecute employers under OSHA's criminal provision, *see* JOSEPH KINNEY & ROSALIE DAY, THE RISING WAVE: DEATH AND INJURY AMONG HIGH RISK WORKERS IN THE 1980S, at 13-15 (1987); William Glaberson, *States Are Toppling Workplace-Injury Convictions*, N.Y. TIMES, Sept. 19, 1988, at 1, col. 4 (nat. ed.).

192. *The OSHA Criminal Penalty Reform Act: Hearing Before the Subcomm. on Labor of the Senate Comm. on Labor & Human Resources*, 102d Cong., 1st Sess. 7 (1991).

193. *See, e.g.*, SUBCOMMITTEE ON LABOR OF THE SENATE COMMITTEE ON LABOR AND PUBLIC WELFARE, 92d Cong., 1st Sess., LEGISLATIVE HISTORY OF THE OCCUPATIONAL SAFETY AND HEALTH ACT OF 1970 (S. 2193, P.L. 91-596) iii (Comm. Print 1971) (foreword by Senator Harrison Williams, one of the eponymous sponsors of OSHA). *But see* NIOSH, FATAL INJURIES TO WORKERS at iii (foreword by J. Donald Millar, director of NIOSH).

194. U.S. BLS, Census of Fatal Occupational Injuries (unpublished data made available to author, Mar. 23, 1994). On the international trend toward lower fatality levels in the wake of the tertiarization of advanced economies, *see* OECD EMPLOYMENT OUTLOOK, July 1989, at 139, 142.

195. *Construction Safety, Health and Education Improvement Act of 1989* at 2 (Sen. Dodd). *See also* John Rekus, *Safety in the Trenches*, OCCUPATIONAL HEALTH AND SAFETY, Feb. 1992, at 26; William Schriver, *Study of Fatalities in the Construction Industry*, SURV. BUS., Summer/Fall 1993, at 45.

196. *The Construction Safety, Health and Education Act of 1991: Hearings on H.R. 1063 before the Subcomm. on Health and Safety of the Committtee on Education and Labor, House of Representatives,* 102d Cong., 1st Sess., at 243 (1991) (testimony of Dr. Knut Ringen on Laborers' Union membership in Indiana).

197. NIOSH, ALERT: REQUEST FOR ASSISTANCE IN PREVENTING HOMICIDE IN THE WORKPLACE 4 (Pub. No. 93-109, 1993). On the media's treatment of co-worker homicide, *see* Erik Larson, *A False Crisis: How Workplace Violence Became a Hot Issue*, WALL ST. J., Oct. 13, 1994, at 1.

198. 1 CARROLL DAUGHERTY, LABOR PROBLEMS IN AMERICAN INDUSTRY 117-19 (1948 [1941]); Robert Smith, *An Analysis of Work Injuries in Manufacturing Industry*, in 3 SUPPLEMENTAL STUDIES FOR THE NATIONAL COMMISSION ON STATE WORKMEN'S COMPENSATION LAWS 9, 20, 23 (1973).

and work schedules drive the industry so there's still an attitude that work must be completed quickly even if it means taking safety shortcuts."'[199] Consequently, in an industry which does not yet subscribe to the view that "[o]ccupational injury and diseases are no longer considered to be the inevitable tribute to progress,"[200] "overexertion" is still the leading cause of accidents in private-sector construction,[201] and more than one-fifth of construction laborers cite the "fast pace of work" as a factor contributing to the injuries that they sustain.[202]

Remarkably, whereas one-quarter of private sector construction injuries are caused by overexertion, on work performed for the U.S. Army Corps of Engineers, where the aggregate accident rate is much lower, the corresponding share is only one-tenth.[203] Nor is this superior government safety record unusual: the "extensive safety program" developed by the Tennessee Valley Authority in the 1930s, for example, also enabled it to achieve a rate of disabling injuries only one-sixth that of private firms.[204]

A basis for such different approaches to safety by the state and the for-profit sector has been set forth by a leading labor economist who nevertheless denied that "the capitalistic system" is to blame for industrial accidents because the profit motive is fed by what consumers want "or can be made to want." Although under socialism production would still take place in hazardous factories, he conceded one "important" difference—

> that the state, having substituted group welfare for the individual . . . profits motive, takes an even longer view than the far-sighted capitalistic employer: the state can make the prevention of accidents a vital part of group welfare rather than merely good business and, not being under the duress of competition, need not sacrifice its ideals for the demands of any immediate situation. In short, human values would be paramount.[205]

A comparison between socialist East and capitalist West Germany provided the most striking test and corroboration of this claim. Confirming that the latter's industrial injury rate was twice the former's, a West German government commission in 1971 explained the difference by reference to the superior system of labor protective controls in East Germany based in large part on the joint participation of unions and works councils.[206]

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199. Jon Nordheimer, *Pressure of Costs Drives Some Contractors to Stress Worker Safety,* N.Y. TIMES, Aug. 21, 1993, at 25 (quoting risk management consultant).

200. J.M. CLERC, INTRODUCTION TO WORKING CONDITIONS AND ENVIRONMENT 29 (1985).

201. U.S. OCCUPATIONAL SAFETY & HEALTH ADMIN., CONSTRUCTION ACCIDENTS: THE WORKERS' COMPENSATION DATA BASE 1985-1988, at 15, 34 (1992).

202. BUREAU OF LABOR STATISTICS, U.S. DEPT. OF LABOR, BULL. NO. 2252: INJURIES TO CONSTRUCTION LABORERS 4-5, tbl. 11 at 16 (1986).

203. U.S. OCCUPATIONAL SAFETY & HEALTH ADMIN., CONSTRUCTION LOST-TIME INJURIES: THE U.S. ARMY CORPS OF ENGINEERS DATA BASE 1984-1988, at x, xi, 2, 8, 21, 41-42 (1992). The Army Corps of Engineers' safety program, which is imposed on the private contractors working for it and reportedly results in the lower accident rate, casts doubt on the claim that "no bosses' government body is going to interfere with the speed with which any boss decides it must make profit." *Capitalism Kills 51 Workers*, CHALLENGE, May 10, 1978, at 5.

204. Swen Kjaer & Max D. Kossoris, *Causes and Prevention of Accidents in the Construction Industry, 1939*, MONTHLY LAB. REV., Oct. 1940, at 935,936 (vol. 50).

205. DAUGHERTY, *supra* note 198, at 105.

206. BUNDESMINISTERIUM FÜR INNERDEUTSCHE BEZIEHUNGEN, DEUTSCHLAND 1971, at 169 (n.d. [1971]).

The same point was made negatively by the head of a captive (that is, steel company-owned) mining operation in explaning his commercial competitors' much higher fatality rates: "'If your stockholders expect to get a certain return, you've got to get it. And therefore you've got to be content with less safety if you're going to get more profit.'"[207] And as the vice president of a construction company and president of the National Constructors Association, an organization of the largest U.S. industrial construction firms, obliquely captured his competitors' reluctance to divert accumulatable profits into expenditures that might spare their workers maiming or death: "Contractors, by the very nature of their work, are cost-conscious, but their approach to savings is paradoxical. When compiling an estimate of cost, safety protection costs are often arbitrarily cut in an endeavor to be low bidder."[208]

The new focus on such firm-external injury sources as murderers and drunken drivers also abstracts from the empirically verified impact of the business cycle on injuries. The periodic hurling of inexperienced workers into and their expulsion from production—which unemployment then deprives them of the continuous experience that forms the best workers—are peculiarities of capitalism. The enormous increase in injury rates during World War II, for example, was in part a product of the unprecedented long-term unemployment of the Great Depression.[209] Nonfatal injuries, relatively few of which are caused by highway accidents or assaults, have retained a much more pronounced cyclical character.[210]

Conjunctural impacts on construction injuries take on a special form. Because industry practice has not been to include in bids a sum for safety and health measures, the International Labour Office has observed, "in times of recession there is a temptation to provide in the tender for methods of work that are cheaper but less safe . . . . The temptation is even greater when the cost of proper precautions is high in relation to the value of the job."[211] Since, from the workers' perspective, "'job security is more important than job safety'" during recessions, according to an OSHAdm inspector, "'workers don't ask questions when a foreman tells them to do something that might be dangerous.'"[212] The resulting rise in injuries may be concealed by the circumstance that workers may keep working during such periods of high unemployment for fear that employers will replace them with sturdier members of the reserve army.[213]

During upswings, in contrast, speedups, the exhaustion of the supply of skilled workers, and the hiring of less experienced workers lead to higher injury rates.[214]

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207. John V. Conti, *Coal-Mine Study Shows Record Can Be Improved When Firms Really Try*, WALL ST. J., Jan. 18, 1973, at 1, 20.

208. G. Collins, BUREAU OF LABOR STANDARDS, U.S. DEPT. OF LABOR, BULL. NO. 243: PROCEEDINGS OF THE PRESIDENT'S CONFERENCE ON OCCUPATIONAL SAFETY 197, 199 (1962).

209. BUREAU OF LABOR STATISTICS, U.S. DEPT. OF LABOR, BULL. NO. 700: INDUSTRIAL-INJURY STATISTICS (1942); Max D. Kossoris & Frank McElroy, *Industrial Injuries in the United States During World War II*, MONTHLY LAB. REV., Oct. 1943, at 865-868 (vol. 57).

210. *See* James C. Robinson, *The Rising Long-Term Trend in Occupational Injury Rates*, 78 AM. J. PUB. HEALTH 276 (1988).

211. INTERNATIONAL LABOUR OFFICE, INTERNATIONAL LABOUR CONFERENCE, 73RD SESSION, 1987: REPORT V (1): SAFETY AND HEALTH IN CONSTRUCTION 6 (1986).

212. Nordheimer, *supra.* note 199.

213. Max D. Kossoris, *Industrial Injuries and the Business Cycle*, MONTHLY LAB. REV., Oct. 1938, at 579,593-94 (vol. 46).

214. *Work Injuries in 1948: Preliminary Estimates*, MONTHLY LAB. REV., Apr. 1949, at 289 (vol. 68); James C. Robinson & Glenn M. Shor, *Business-Cycle Influences on Work-Related Disability in*

This cyclical structure assumes a special profile in construction with its disproportionately large sector of small, interest-sensitive firms compelled to complete contracts as quickly as possible in order to reduce loans charges, greater (and to some extent irrational) seasonality[215] and crowding of projects into short periods, and reliance on discrete projects. One extreme manifestation of the transiency of construction is the fact that three-quarters of injured construction laborers have less than one year's experience and one-eighth of all injuries to these workers take place on their first day at work, while one-quarter of all construction injuries occur during the worker's first month on the job.[216]

Counting on OSHA

> In some states, there are far more game wardens than there are work safety inspectors. This had led some to observe that perhaps after all, safety is "for the birds."[217]

The issue of the extent and trend of industrial fatalities played an important part in the struggles for state intervention beginning in the late 1960s. "[T]he most important single factor" that prompted congressional action on OSHA "[p]robably . . . was the observed increase in the industrial accident rate, which rose nearly 29% from 1961 to 1970."[218] Such statistics are, however, too dry and barren to mobilize the political process. But then: "Good empirical studies are neither necessary nor sufficient for the evolution of good policy. Sensational reports about tragic events . . . are often more effective in eliciting legislative action."[219] Although two-thirds of mine deaths occur individually in solitary "accidents" such as roof falls, the fact that explosions and fires also kill large numbers of workers at one time creates the kind of mass suffering qua human interest story that compels news media to publicize the dangerous work, cavalier business attitudes, and lackadaisical government enforcement. Thus the deaths of 78 miners in the very modern Consolidation Coal Company mine in Farmington, West Virginia in 1968 galvanized public opinion long enough to pass the Federal Coal Mine Health and Safety Act of 1969;[220] the 91 miners who were killed in the Sunshine silver mine in Idaho in 1972 focused the congressional mind sufficiently to amend that statute in 1977 to include all mines.[221]

Construction and Manufacturing, 67 MILBANK Q. 92 (Supp. 2, Pt. 1, 1989).

215. *See* U.S. DEPT. OF COMMERCE, SEASONAL OPERATION IN THE CONSTRUCTION INDUSTRIES: SUMMARY OF REPORT AND RECOMMENDATIONS OF A COMMITTEE OF THE PRESIDENT'S CONFERENCE ON UNEMPLOYMENT vi (1924) (customs fixed in preindustrial period rather than bad weather is the principal cause of seasonality).

216. *Supra* note 202, at 1; Norman Root & Michael Hoefer, *The First Work-Injury Data Available from New BLS Study*, MONTHLY LAB. REV., Jan. 1979, at 76, tbl. 3 at 79 (1976 data from Maryland).

217. *To Promote Health and Safety in the Building Trades and Construction Industry: Hearings Before the Select Subcomm. on Labor of the House Comm. on Education and Labor*, 91st Cong., 1st Sess. 35 (1969) (statement of John Lyons, general president, Int'l Ass'n of Bridge, Structural and Ornamental Ironworkers).

218. NICHOLAS A. ASHFORD, CRISIS IN THE WORKPLACE 46 (1976). *See also* Robert Smith, *The Feasibility of an "Injury Tax" Approach to Occupational Safety*, 38 LAW & CONTEMP. PROBS. 730 (1974).

219. Walter Oi, *On the Economics of Industrial Safety*, 38 LAW & CONTEMP. PROBS. 669, 680 (1974).

220. Pub. L. No. 91-173, 83 Stat. 742 (1969); Ben A. Franklin, *Safety Comes to the Mines a Century Late*, N.Y. TIMES, Jan. 4, 1970, § 4, at 3.

221. Federal Mine Safety and Health Act of 1977, Pub. L. 95-164, 91 Stat. 1290 (1977) (codified

Largely deprived of the sympathy that the non-subterranean population periodically displays towards those whose life-chances have forced them into their otherworldly fossorial work, the rest of the working class faced significant political-economic and propagandistic obstacles to its efforts to impose legal restrictions on employers' control of the workplace. These barriers emerged clearly during the run-up to the enactment of OSHA. Resistance by the state to demands for intervention into managerial prerogatives was not new.[222] Prior to 1970, the federal government's occupational safety and health private-sector jurisdiction applied to workers in plants with federal contracts as well as to longshore and harbor workers.[223] Yet as a result of "[t]he Government's long-standing distaste for a stronger, more aggressive enforcement policy . . . the available penalties [we]re almost never invoked against corporate offenders."[224]

At the same time, advocates of state intervention had to contend with the disproportionality between media reporting on strikes and accidents, especially in the construction industry. Injuries had "cost the industry" 17 million man-days annually between 1958 and 1965 whereas work stoppages resulted in only 3.8 million lost man-days;[225] indeed, in 1967 construction workers alone sustained disabling injuries resulting in almost as many days lost as days lost to work stoppages in all industries.[226] If, however, the president of the Building and Construction Trades Department of the AFL-CIO testified to Congress, the figures were reversed:

> The story would be spread over the front pages of the world. Loud demands would follow that the labor leaders involved in the stoppages be called to account. Public opinion would be outraged. On the other hand, accidents which result in millions of man-days lost—not to mention the human suffering involved—generally are tucked away on the back pages to be eventually ignored.[227]

Even the enactment and implementation of OSHA have failed to dissolve employers' resistance to systemic change. The corporate safety movement and construction firms in particular continue to insist that injuries are largely the result of human, that is, the workers' own fault.[228] "[T]he only way to make improvements in

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at 30 U.S.C. §§ 801-962 (1988)); Barry Newman, *Silver-Mine Disaster Prompts Fight on Laws Tightening Safety Rules*, WALL ST. J., Oct. 26, 1972, at 1, 21; S. REP. NO. 181, 95th Cong., 1st Sess. 3-4, *reprinted in* 1977 U.S.C.C.A.N. 3401, 3403-04.

222. On the continuity of such weak enforcement under the Mine Safety Act, *see* Burt Schorr, *Getting Off Lightly*, WALL ST. J., July 28, 1971, at 1, 25; Rand Guffey, *Mine Safety Furror*, WALL ST. J., June 25, 1970, at 1, 23.

223. *See, e.g.*, Walsh-Healey Government Contracts Act, ch. 881, § 1(e), 49 Stat. 2036, 2037 (1936) (codified at 41 U.S.C. § 35(e) (1988)); Service Contract Labor Standards Act, Pub. L. No. 89-286, § 2(a) (3) (1965) (codified at 41 U.S.C. § 351(a) (3) (1988)); Longshoremen's and Harbor Workers' Compensation Act, Pub. L. No. 85-742, 72 Stat. 835 (1958) (codified at 33 U.S.C. § 941 (1988)) (enjoining employers to maintain "reasonably safe employment" for employees on the navigable waters of the United States and authorizing Secretary of Labor to issue regulations to protect such employees).

224. Walter Rugaber, *Records Show That Lax Government Regulations Allow Occupational Hazards to Grow*, N.Y. TIMES, Jan. 2, 1970, at 17.

225. BUREAU OF LABOR STATISTICS, U.S. DEPT. OF LABOR, BULL. NO. 1656: COMPENSATION IN THE CONSTRUCTION INDUSTRY: EMPLOYMENT PATTERNS, UNION SCALES, AND EARNINGS 23 (1970).

226. *Federal Construction Safety: Hearings Before the Subcomm. on Labor of the Senate Comm. on Labor and Public Welfare*, 91st Cong., 1st Sess. 8 (1969).

227. *Construction Safety: Hearings Before the Select Subcomm. on Labor of the House Comm. on Education and Labor*, 90th Cong., 1st & 2d Sess. 6 (1968) (C.J. Haggerty).

228. BERMAN, *supra* note 97, at 76.

safety in construction," the chairman of the legislative committee of the Associated General Contractors of America explained to Congress, "is to educate the individual to operate on a safe basis."[229] Where, however, employers impose piece rates, which make workers "reluctant to use safety devices . . . for fear of slowing their production and cutting their pay checks,"[230] the injunction to operate safely might come with more grace from someone other than the employer who set those rates.[231]

This individualizing, blame-the-victim approach takes on an added dimension when a leader of the antiunion wing of the construction industry safety organization analogizes the victims to naughty children whose parent-employers are unfairly held legally responsible for their carelessness:

> [I]t's similar to dealing with children. If you tell them, go play and don't get close to the river. When they get too close, you have to do something. But they are personally held accountable.
>
> When they are in school and you have a test, the teacher says look, we're going to have a test tomorrow, you need to study this and study this, and some of them study it and they get good grades and some others don't study and they don't get good grades, but they are individually and personally held accountable.[232]

Construction unions have accommodated this programmatic infantilization of the working class by failing to vindicate an autonomous role for workers in creating safer working conditions than have traditionally been compatible with profitability. Instead, for example, the president of the United Brotherhood of Carpenters chose to combat management's line by pushing employers to exercise their panoply of managerial prerogatives vis-à-vis a passively compliant labor force:

> The employer sets the tone. If he refuses to tolerate unsafe work from workers who have been trained and warned about unsafe practices, then fires them if they continue to work unsafely, every other man and woman on that job will get the message and work carefully. It's a simple proposition—you lose your job if you don't listen to the boss.[233]

The dangers inherent in according employers a monopoly over safety emerge clearly from their own reaction to a proposed amendment to OSHA that would require construction employers to appoint a project safety coordinator to enforce a statutorily required health and safety plan to protect workers on each project.[234] When asked by a legislator why construction firms could not appoint their foremen as safety coordina-

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229. *Supra* note 227, at 44.

230. Byron Calame, *Job-Hazard Law Spurs Complaints from Firms on Cost of Safeguards*, WALL ST. J., Dec. 1, 1971, at 1, 19. Engels had noticed 125 years earlier that the necessity of working fast caused accidents. FRIEDRICH ENGELS, DIE LAGE DER ARBEITENDEN KLASSE IN ENGLAND, in 2 KARL MARX [&] FRIEDRICH ENGELS, WERKE 225, 388 (1957 [1844]).

231. *See* STUDENTERFRONTENS ARBEJDSMEDICINGRUPPE, MALER RAPPORTEN: EN FORELØBIG RAPPORT OM SUNDHEDSFARERNE I MALERFAGET 24 (Aarhus: Studenterrådet, n.d. [ca. 1971]) (discussing masks for painters); OECD EMPLOYMENT OUTLOOK, July 1989, at 137; TOM DWYER, LIFE AND DEATH AT WORK: INDUSTRIAL ACCIDENTS AS A CASE OF SOCIALLY PRODUCED ERROR 104-105 (1991).

232. *Supra* note 196, at 28 (testimony of Greg Denton, director of safety, Fluor-Daniel and chair, Associated Builders & Contractors, Safety Comm.).

233. *Id.* at 218 (statement of Sigurd Lucassen).

234. H.R. 1063, § 4(a), H.R. Rep. No. 662, 102d Cong., 2d Sess. 4 (1991).

tors, the president of one firm, who also represented the National Association of Home Builders, responded that: "That will not work . . . . The reason is that the foreman has a conflict of interest . . . . The foreman's job is to make sure that the work is done on a specific schedule." While conceding that the foreman's job always involved "safety too," the employers' representative complained "that if we said to the foreman, you are the safety coordinator but . . . also part of your job is to get this particular application completed by a certain . . . time, when he sees a specific problem, is he going to look at the safety issue or is he going to look at his time schedule?"[235] Here the contradiction between human needs and the requirements of self-expanding value is at its sharpest.

The continuing high level and rate of fatalities and nonfatal injuries in construction, most of which even industry representatives admit are preventable,[236] is in part a function of the below-average provisioning by building firms of on-site doctors.[237] Although OSHA mandates safe workplaces,[238] the statute itself does not require employers to provide on-site physicians, nurses, or industrial hygienists. Instead, under OSHA regulations:

> (a) The employer shall ensure the ready availability of medical personnel for advice and consultation on matters of plant health.
>
> (b) In the absence of an infirmary, clinic, or hospital in near proximity to the workplace which is used for the treatment of all injured employees, a person or persons shall be adequately trained to render first aid.[239]

Regulations under OSHA and the Contract Work Hours and Safety Standards Act (which covers federal public works)[240] specifically tailored to the construction industry add that:

> (b) Provision shall be made prior to the commencement of the project for prompt medical attention in case of serious injury.
>
> (c) In the absence of an infirmary, clinic, hospital, or physician, that is reasonably accessible in terms of time and distance to the worksite, which is available for the treatment of injured employees, a person who has a valid certificate license in first-aid training . . . shall be available at the worksite to render first aid.[241]

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235. *Supra* note 196, at 36 (testimony of Ira Norris).

236. *Legislative Hearings on the Construction Safety, Health, and Education Improvement Act of 1990* at 62-63 (statement of Neil A. Norman, president elect, National Society of Professional Engineers). *See also id.* at 353 (testimony of J. Donald Millar, director, NIOSH); LaBar, *supra* note 20, at 63.

237. The desolate state of industrial injury statistics in the United States corresponded, at least until the advent of OSHA and NIOSH, to the lack of a national occupational injury and disease prevention policy or an appropriate research program. For examples of the much more advanced European research in construction safety and health, *see* JAN WAHLBERG, YRKESHUDSJUKDOMAR HOS BYGGNADSARBETARE (Byggnadsindustrins Forskningsrapporter och Uppsatser No. 11; n.d. [1968]); SEVED LINDQUIST, HÖRSELSKADOR HOS BYGGNADSARBETARE (Byggnadsindustrins Forskningsrapporter och Uppsatser No. 15; n.p., n.d. [1969]); JAN KRONLUND, PÅ BYGGET: ARBETSPSYKOLOGISKA STUDIER I BYGGNADSINDUSTRIN (1969); III. INTERNATIONALES SYMPOSIUM ARBEITSHYGIENE UND ARBEITSSCHUTZ IM BAUWESEN (1972).

238. 29 U.S.C. § 654 (a) (1) (1988).

239. 29 C.F.R. § 1910.151 (1992). The term "in near proximity" survived a joint challenge as to vagueness by the OSHA Review Commission and an employer; Brennan v. Occupational Safety and Health Review Commission and Santa Fe Trail Transport Co., 505 F.2d 869 (10th Cir. 1974).

240. 40 U.S.C. § 333 (1988).

241. 29 C.F.R. § 1926.50(b) & (c) (1988).

Construction firms in fact employ proportionally far fewer doctors and nurses than firms in general. In part this underrepresentation may be a function of the disproportionate weight of small firms in the industry. Overall in the mid-1970s, 81 percent of all U.S. firms with more than 50,000 employees employed at least one full-time doctor compared to only 3 percent of those with fewer than 1,000 employees.[242] In 1972, the OSHAdm and NIOSH conducted the first survey of medical services provided by employers. In contrast to 21 percent of all private nonfarm and 69 percent of all manufacturing employees, only 1.5 percent of construction employees worked in establishments providing nurses' services. Similarly, only one in 13 construction employees worked in an establishment served by a doctor full time or part time compared to 26 percent of all private nonfarm and 36 percent of manufacturing employees. Moreover, only one construction employee in 14 worked in establishments providing the services of an industrial hygienist—who is qualified "to identify, measure, and evaluate health hazards in the work environment and to plan measures to eliminate, control, or reduce such hazards"—compared to 18 percent of all private nonfarm and 36 percent of manufacturing employees.[243] Finally, a more recent OSHAdm survey reveals that only one-sixth of all construction employees worked in firms that provide physical exams and medical tests to detect injuries and illnesses potentially related to work activities compared to one-third of all employees and three-fifths of all those employed in manufacturing.[244]

Finding no mathematical correlation between injury rates and the degree of provision of medical services among industry divisions, the BLS concluded "that the availability of nurses' services did not appear to be related to injury and illness experience."[245] Presumably the correlation in question is that between a high injury rate and a low degree of provision of medical services—as it exists, for example, in construction. Such a tangible causal chain would make plausible the conclusion that increasing such services would contribute to the reduction of injuries. In the more socially oriented societies of Western Europe, the starting point is inverted: there the initial hypothesis is that branches with high injury rates are precisely the ones that should also be well provided with medical services.[246]

Health and safety workers can, to be sure, prevent numerous injuries, mitigate the severity of others, and reduce fatalities through life-saving emergency services (as has also increasingly become the case on the military battlefield).[247] Since these services are provided by individual firms rather than by the state, risks may merely be shifted such that some workers must seek employment in firms that cannot afford such selectivity. What such intervention does not achieve, however, is elimination of the objective causes of injuries that inhere in a profit-driven competitive system. Such

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242. David Graulich, *Company or Patient? Corporate Physicians Torn by Dual Loyalty*, WALL ST. J., Oct. 8, 1975, at 1.

243. BUREAU OF LABOR STATISTICS, U.S. DEPT. OF LABOR, BULL. NO. 1830: OCCUPATIONAL INJURIES AND ILLNESSES BY INDUSTRY, 1972, at 6-9, 98 (1974).

244. Hugh Conway et al., *The Occupational Safety and Health Administration's 1990-1991 Survey of Occupational Medical Surveillance Prevalence and Type of Current Practices*, 35 J. OCCUPATIONAL MED. 659, tbl. 2 at 662 (1993).

245. *Supra* note 243, at 6.

246. *See* SABINE KAISER, GEWERKSCHAFTEN UND MEDIZIN 2: BETRIEBSÄRTZLICHE VERSORGUNG IN DER BRD UND IN ANDEREN EG-STAATEN 72-84 (1973).

247. *See* OECD, EMPLOYMENT OUTLOOK, July 1989, at 139.

causes should not be confused with so-called technical defects, which are nothing but economic decisions made at a previous stage of production.[248]

Is It Worth Getting Killed at Work?

> You never balance the wage against the risk; you balance the wage against the alternative. And the alternative is starving when you're put in this situation. That's what so phony about this cost/benefit analysis. A worker in the plant doesn't say, "Well, I'm getting $6.50 an hour so I'm gonna take this risk." The worker says, "I'm getting $6.50 an hour. If I open my mouth I might get nothing an hour, or I might get minimum wage. In that case, I can't afford to live." So, what's the difference? There's no difference for a person in that position. Either way they're trapped.[249]

One of the uses to which economists and public policy analysts have put industrial fatality data is to test whether labor markets provide a private consensual mechanism for achieving the socially "optimal amount of accident risk exposure" so as to maximize the difference between total benefits—unimpeded production creating wages for workers, profits for firms, and products for consumers—and costs—purportedly including the physical, mental, and economic costs to workers.[250] Perfectly competitive labor markets are said to create incentives for firms, which are assumed to internalize all accident costs, to take measures to reduce injury levels sufficiently to be able to recruit workers with as small a wage premium as possible.[251]

Thus, according to the original version of this thesis, Adam Smith's doctrine of compensatory wages, if an industry, such as construction, is extraordinarily hazardous, its workers will be indemnified for the uncommon risks to which they are exposed: "The wages of labour vary with the ease or hardship, the cleanliness or dirtiness, the honourableness or dishonourableness of the employment. . . . In trades which are known to be very un-wholesome, the wages of labour are always remarkably high." This tendency to equality of the "whole of the advantages and disadvantages of the different employments" presupposed, to be sure, that "every man was perfectly free both to chuse what occupation he thought proper, and to change it as often as he thought proper."[252]

Smith assumed, in other words, that workers do not knowingly accept unsafe employment without some offsetting benefit such as a wage higher than that associated with a less unsafe job. Smith did not credit the possibility that some workers might be constrained to perform dangerous work without additional compensation simply because the alternative was that they and their family would "'all starve together.'"[253]

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248. *See* HANS-ULRICH DEPPE, INDUSTRIEARBEIT UND MEDIZIN: EIN BEITRAG ZUR SOZIOLOGIE MEDIZINISCHER INSTITUTIONEN AM BEISPIEL DES WERKSÄRTZLICHEN DIENSTES IN DER BRD 113-14, 151 (1973).

249. DOROTHY NELKIN & MICHAEL BROWN, WORKERS AT RISK: VOICES FROM THE WORKPLACE 91 (1984) (interview with chemical operator in food processing plant).

250. James Chelius, *The Control of Industrial Accidents: Economic Theory and Empirical Evidence,* 38 LAW & CONTEMP. PROBS. 700, 702 (1974).

251. *See, e.g.*, Robert McLean et al., *Compensating Wage Differentials for Hazardous Work: An Empirical Analysis*, Q. REV. ECON. & BUS., Autumn 1978, at 97.

252. ADAM SMITH, AN INQUIRY INTO THE NATURE AND CAUSES OF THE WEALTH OF NATIONS 100, 110, 99 (Random House 1937) (1776).

253. *See, e.g.*, W. RORABAUGH, THE CRAFT APPRENTICE: FROM FRANKLIN TO THE MACHINE AGE IN AMERICA 131 (1986) (quoting a mid-nineteenth-century journeyman). Why under these circumstances

Nor could his model accommodate the possibility that workers tolerated unsafe workplaces for fear that they might lose their livelihood. An incident in Britain in the 1980s presented the starkest imaginable illustration of this pressure: the parents of a seventeen-year-old worker whose arm had been trapped in a machine not only promised to waive compensation, but even to pay for the damage to the machine—if only their son could retain his job.[254]

With alacrity nineteenth-century Anglo-American courts adopted the Smithian fiction of free and equal contracting between atomized labor and aggregated capital in adjudicating workers' personal injury claims against their employers. In the first U.S. case testing and denying an employer's liability for such negligence,[255] a concurring judge asserted in 1841 that: "No prudent man would engage in any perilous employment, unless seduced by greater wages than he could earn in a pursuit unattended by any unusual danger."[256] And the following year, in a decision that would reverberate to workers' detriment into the next century, Chief Justice Shaw of the Massachusetts Supreme Judicial Court held that a worker employed to perform specified services "takes upon himself the natural and ordinary risks and perils incident to the performance of such services, and in legal presumption, the compensation is adjusted accordingly."[257]

Yet neither the judiciary nor the economics profession was hermetically impervious to a more realistic analysis of the allegedly free occupational choices made by the working class. While granting that Smith's conclusions followed from his premises, John Stuart Mill found the real world of the 1850s staggeringly different from the one that Smith had conjured up. In an economy permanently shaped by widespread unemployment:

> The really exhausting and . . . repulsive labours, instead of being better paid than others, are almost invariably paid the worst of all, because performed by those who have no choice. It would be otherwise in a favourable state of the general labour market . . . . But when the supply of labour so far exceeds the demand that to find employment at all is an uncertainty, and to be offered it on any terms a favour, the case is totally the reverse . . . . The more revolting the occupation, the more certain it is to receive the minimum of remuneration, because it devolves on the most helpless and degraded . . . . [T]he inequalities of wages are generally in an opposite direction to the equitable principle of compensation erroneously represented by Adam Smith as the general law of the remuneration of labour. The hardships and the earnings, instead of being directly proportional, as in any just arrangements of society they would be, are generally in an inverse ratio to one another.[258]

Nor was Mill alone in this heterodox view. Even as conservative an institution as the British High Court pierced the Smithian fiction as early as 1888. In ruling in favor of a carpenter who had sued an employer for negligently causing his workplace injury,

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the non-Smithian outcome is "unfortunate[] for all concerned" including the employer is unclear. LAWRENCE BACOW, BARGAINING FOR JOB SAFETY AND HEALTH 52 (1980).

254. K. WEDDERBURN, THE WORKER AND THE LAW 419 (3d ed. 1986) (1965).

255. For speculation as to why such reported cases appeared so late, see BARTRIP & BURMAN, THE WOUNDED SOLDIERS OF INDUSTRY at 24-25, 103-105.

256. Murray v. South Carolina R.R., 26 S.C.L. (1 McMul.) 385, 402 (1841).

257. Farwell v. Boston & Worcester R.R., 45 Mass. (4 Met.) 49, 57 (1842).

258. JOHN STUART MILL, THE PRINCIPLES OF POLITICAL ECONOMY 388 (W. Ashley ed. 1926) (1852).

the court offered a model of legal realism: "If the plaintiff could have gone away from the dangerous place without incurring the risk of losing his means of livelihood, the case might have been different; but he was obliged to be there; his poverty, not his will, consented to incur the damage."[259]

About the same time, Alfred Marshall, Mill's successor as the English-speaking world's foremost economist, advanced a variant of this particular attack on the Smithian presumption—albeit from a social Darwinian viewpoint.[260] Equalizing differences were inapplicable to

> the disagreeableness of work . . . if it is of such a kind that it can be done by those whose industrial abilities are of a very low order. For the progress of science has kept alive many people who are unfit for any but the lowest grade of work. They compete eagerly for the comparatively small quantity of work for which they are fitted, and in their urgent need they think almost exclusively of the wages they can earn: they cannot afford to pay much attention to incidental discomforts . . . .
>
> Hence arises the paradoxical result that the dirtiness of some occupations is a cause of the lowness of the wages earned in them. For employers find that this dirtiness adds much to the wages they would have to pay to get the work done by skilled men of high character working with improved appliances; and so they often adhere to old methods which require only unskilled workers of but indifferent character, and who can be hired for low . . . wages, because they are not worth much to any employer.[261]

The belated clamor for workers' compensation legislation in the United States during the first decade of the twentieth century brought in its wake a fresh onslaught on Smithianism emanating from the highest office. In a special message to Congress, President Theodore Roosevelt himself observed that: "In theory, if wages were always freely and fairly adjusted, they would always include an allowance as against the risk of injury, just as certainly as the rate of interest for money includes an allowance for insurance against the risk of loss." In fact, however, the workers' world did not work that way.[262] P. Tecumseh Sherman, the legal expert of the influential pro-corporate National Civic Federation, testifying before the New York State Commission on Employers Liability, went even farther: "These people are not free to leave these hazardous employments and to go to non-hazardous employments. As a mass they are bound by necessity to the work. [T]here is no free assumption; it is forced assumption."[263] And that commission itself recommended enactment of a workers' compensation program because "the laissez faire system of political economy . . . does not work out."[264]

Such anti-Smithian arguments have, however, fallen out of favor. Contemporary orthodox economists may concede that wages are formed differently than other commodity prices[265] but nevertheless adhere to the mechanistic notion of "equalizing dif-

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259. Thrussell v. Handyside, 20 Q.B.D. 359, 364 (1888).

260. For a similar approach, *see* SIDNEY WEBB & BEATRICE WEBB, INDUSTRIAL DEMOCRACY 356-57 (1920) (1897).

261. ALFRED MARSHALL, PRINCIPLES OF ECONOMICS 464 (8th ed. 1969) (1890).

262. 42 CONG. REC. 1347 (1908).

263. [NEW YORK STATE COMM. ON EMPLOYERS LIABILITY], MINUTES OF EVIDENCE 17 (1910).

264. [NEW YORK STATE COMM. ON EMPLOYERS LIABILITY], REPORT at 7.

265. "[T]he human being as the bearer of labor performance is not only a factor of production, but, with his wishes and purposes, the starting point and goal of all economic activity in general."

ferences."[266] According to W. Kip Viscusi, the theory's chief academic proponent in the industrial injury context, the Smithian claim "that individuals require higher wages to accept jobs they view as hazardous" hinges on two minimal prerequisites: "that workers prefer being healthy to being dead or injured and that they prefer more consumption to less."[267]

Contrary to Viscusi's assertion, however, the model of perfect competition underlying the doctrine of equalizing differences implicitly assumes a much broader array of worker characteristics and a set of employer-employee relationships that are far from typical: equal bargaining power, infinite mobility, and encyclopedic information.[268] In contemporary econometric modeling, like nineteenth-century judicial opinions, "[t]he economic compulsion which left [the worker] no choice except starvation, or equally dangerous employment elsewhere, [i]s entirely disregarded."[269] Thus, for example, workers who are considerably more disadvantaged by their employer's power or right to fire them at-will than the employer is discomfited by their freedom to quit are hardly in a position to demand the elimination of unsafe working conditions.

Attempts by those late-twentieth-century economists who bother to take note of Mill's "paradox that the most attractive jobs in society are also the highest paid" to reconcile it with Smith's notion of compensatory wages reinforce rather than undermines Mill's position. Thus again according to Viscusi:

> a worker with greater wealth will be less willing to incur job risks or . . . the premium necessary to induce him to accept any particular risk will be greater.
>
> This behavior is similar to many other patterns of consumer choice. Richer consumers purchase better cuts of meat, more comprehensive health insurance, and higher-quality cars. The influence of a worker's wealth on his willingness to incur an occupational risk arises from a similar variation in tastes . . . . Individuals at the top of the occupational hierarchy . . . have a wider range of work opportunities. Their more affluent economic status will be reflected in a lower willingness to boost their income even further through work on a hazardous job . . . .[270]

Instead of resolving the alleged paradox, Viscusi has merely rephrased Mill's theory of noncompeting groups: workers without choices are compelled to submit to fatal risks that others are in a position to avoid. When, in addition, employers in particularly unsafe industries reorganize production processes in order to replace skilled workers (who have choices) with less skilled workers, who have fewer opportunities to avoid hazardous employment, firms can recruit a labor force without offering any significant premia.[271]

Because the absence of the Smithian prerequisites has historically made the doctrine of compensatory wages unrealistic, early advocates of workers' compensation

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ERICH SCHNEIDER, EINFÜHRUNG IN DIE WIRTSCHAFTSTHEORIE, II. TEIL 374 (1967).

266. *See e.g.*, PAUL SAMUELSON, ECONOMICS 579 (9th ed. 1973).

267. W. VISCUSI, EMPLOYMENT HAZARDS: AN INVESTIGATION OF MARKET PERFORMANCE 271 (1979).

268. *See* Oi, *supra* note 219, at 695 n.70 ("A worker could, conceivably, go from plant to plant and examine the posted annual summaries [of injuries required by OSHA] to see which plant had the best industrial safety record last year").

269. WILLIAM PROSSER, HANDBOOK OF THE LAW OF TORTS 506 (1941).

270. W. VISCUSI, RISK BY CHOICE at 45-46.

271. JAMES ROBINSON, TOIL AND TOXICS: WORKPLACE STRUGGLES AND POLITICAL STRATEGIES FOR OCCUPATIONAL HEALTH 75-94 (1991).

programs took the position that: "This legal fiction . . . has no basis in fact; railroad trainmen, for instance, obtain no more than the wages of ordinary laborers, although one out of every eleven of them is seriously injured every year. [O]ther workmen in extrahazardous trades are paid no more than laborers in other occupations excepting where the matter of skill enters into the question."[272] Another proponent of state intervention even charged that "dangerous trades really pay lower rather than higher wages, or, stated in another form, such industries command the services of only the poorly paid laborers."[273] Recent econometric studies confirm the absence of statistical significance between wage rates and occupational death rates.[274] And even Viscusi is constrained to conclude from his empirical study that "blue-collar workers in the more hazardous occupations do not receive additional remuneration that is sufficiently great to be visible to the casual observer."[275] Risk premia for fatal injuries that have been calculated in the range of a few percentage points[276] cannot support the claim that the labor market fully compensates such workers for the risks to which their employer exposes them.[277] Even state intervention in the form of workers' compensation programs fails to close the gap—especially in states where they provide poverty-level replacement benefits far below the worker's average income or exclude whole groups of workers such as agricultural workers, who are exposed to extraordinary risks.[278]

Recent surveys cast further doubt on the Smithian dogma by showing that, although workers with tenure of one to three months incurred three times as many injuries as those with one to three years tenure and eight times as many injuries as those with more than twenty years tenure, fewer than 30 percent of beginners reported severe hazards to management compared to 70 percent of workers who had been at a place of employment between five and ten years.[279] As a chemical worker, for example, who expressed great trepidation about the "white, drippy, slimy stuff . . . hanging all over" him as a result of being required to work in a lime kiln, remarked: "Most guys won't tell their foreman, 'I'm not going to do it,' because they just got hired and they'll lose their job . . . . We don't really have a choice. I can't refuse to work knowing that tomorrow I can get another job. I can't look for a year and a half for a job. I'd lose everything."[280]

As OSHA was going into effect in 1971, several dozen *Wall Street Journal*

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272. Adna Weber, *Employers' Liability and Accident Insurance*, 18 POL. SCI. Q. 256, 258-59 (1902). *See also supra* note 264.

273. FRANK LEWIS, STATE INSURANCE: A SOCIAL AND INDUSTRIAL NEED 81 (1909).

274. J. Leigh, *No Evidence of Compensating Wages for Occupational Fatalities*, 30 INDUS. REL. 382 (1991).

275. W. VISCUSI, EMPLOYMENT HAZARDS at 250.

276. Robert S. Smith, *Compensating Wage Differentials and Public Policy: A Review*, 32 INDUS. & LAB. REL. REV. 339, 344-46 (1979).

277. Ronald Ehrenberg, *Workers' Compensation, Wages, and the Risk of Injury*, NEW PERSPECTIVES IN WORKERS' COMPENSATION 71, 79-81 (John Burton, Jr. ed., 1988).

278. *See, e.g.*, REPORT OF THE NATIONAL COMMISSION ON STATE WORKMEN'S COMPENSATION LAWS 18 (1972); Monroe Berkowitz, *Workmen's Compensation Income Benefits: Their Adequacy and Equity*, 1 SUPPLEMENTAL STUDIES FOR THE NATIONAL COMMISSION ON STATE WORKMEN'S COMPENSATION LAWS 189, 200-204 (1973); EDWARD BERKOWITZ, DISABLED POLICY: AMERICA'S PROGRAMS FOR THE HANDICAPPED 33-40 (1989) (1987). Farming occupations accounted for less than 3 percent of employment but 11 percent of fatalities. Toscano & Windau, *supra* note 172, tbl. 5 at 44.

279. Richard Frenkel et al., *Occupational Safety and Health: A Report on Worker Perceptions*, MONTHLY LAB. REV., Sept. 1980, at 11.

280. *Supra* note 29, at 92.

reporters inadvertently launched an impressive assault on the doctrine of equalizing difference while examining the question as to why a worker would "continue to work at a job that has cost him his health and paid him a wage that he has had to struggle on all his grown life." In the course of discovering that "Brutal, Mindless Labor Remains a Daily Reality for Millions in the U.S.," the journalists kept hearing the same answer: "'There aren't many jobs around here for a high school dropout . . . . I'd leave in a minute, but where would I go?' That is the dilemma of millions of relatively unskilled laborers . . . . They mine coal, shovel steel slag, gut animal carcasses." Asked why he tended iron melting furnaces in 140° heat, another worker responded that "[t]here's only three choices—work, starve, or go to jail." Although coke oven workers "exhibit considerable militancy about pollution and safety . . . the men know that, in the end, the company has the upper hand. 'As long as the company can get another man to take your job if you go home, they'll do nothing.'" Why did coke oven workers at a U.S. Steel Corporation plant who walked under walls of flames and on bricks as hot as 180° and inhaled such quantities of toxins that they were "ten times more likely to die of lung cancer than the average steelworker," nevertheless receive "a low wage for a steelworker"? This particular anti-Smithian outcome may have been overdetermined by the racially discriminatory assignment of an overwhelmingly black work force to this uncompensatedly life-threatening work.[281] This aspect of racism, far from being confined to a few plants, is a statistically significant macroeconomic phenomenon.[282]

The finding that union workers secure higher risk premia for hazardous jobs than do atomized workers casts additional doubt on the "'adequacy' of the nonunion market."[283] Unless they are employed in highly unionized industries, "[w]orkers in very hazardous occupations . . . do not receive meaningful levels of hazard pay."[284] Indeed, several studies have even shown negative compensating wage differentials for nonunion workers exposed to fatal hazards.[285] This divergence results from differences not only in bargaining power but also in knowledge: a union with thousands of members knows that a certain number have been and will be injured every year whereas an individual worker may underestimate her risk level by generalizing from limited experience.[286]

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281. *Brutal, Mindless Labor Remains a Daily Reality for Millions in the U.S.*, WALL ST. J., July 16, 1971, at 1.

282. JAMES ROBINSON, TOIL AND TOXICS: WORKPLACE STRUGGLES AND POLITICAL STRATEGIES FOR OCCUPATIONAL HEALTH 96-105 (1991).

283. Craig Olson, *An Analysis of Wage Differentials Received by Workers on Dangerous Jobs*, 16 J. HUM. RESOURCES 167, 185 (1981).

284. James Robinson, *Hazard Pay in Unsafe Jobs: Theory, Evidence, and Policy Implications*, 64 MILBANK Q. 650, 663 (1986). *See also* Jeff Biddle & Gary Zarkin, *Worker Preferences and Market Compensation for Job Risk*, 70 REV. ECON. & STAT. 660, tbl. 5 at 666 (1988) (compensation required to make union workers indifferent to a 1/100 increase in probability of injury almost six times greater than for nonunion worker). Significantly, the two relatively highly paid unskilled jobs that *Wall Street Journal* reporters found to be dangerous to safety (token seller in New York City subway system) and health (tunnel patrolman in New York City) were in the public sector and unionized. *Monotonous Labor Is Torturous for Some, 'My Thing' for Others*, WALL ST. J., July 22, 1971, at 1, col. 6.

285. William Dickens, *Differences Between Risk Premiums in Union and Nonunion Wages and the Case for Occupational Safety Regulation*, 74 AM. ECON. REV. 320 (1984).

286. GUIDO CALABRESI, THE COSTS OF ACCIDENTS: A LEGAL AND ECONOMIC ANALYSIS 207 n.7 (1971) (1970). For a description of the implementation of unusually strong union safety and health programs at several large employers, *see* BACOW, BARGAINING FOR JOB SAFETY AND HEALTH at 60-87.

A comparison of unionized and nonunionzed construction and non-construction laborers will illustrate this point. Construction laborers are exposed to one of the highest occupational fatality rates in the United States. From 1980 to 1989, 39.5 per 100,000 of them were killed on the job compared to about 17 among non-construction laborers; during the same period, the corresponding rates for all construction workers and all workers were 25.6 and 7.0 respectively.[287] For 1992, the Census of Fatal Occupational Injuries revealed a 3 to 1 ratio in fatality rates between construction and non-construction laborers.[288] A study of unprecedented detail conducted by the BLS shed light on union-nonunion wage differentials in 1970. Among year-round, full-time construction laborers, 34 percent of whom were unionized, unionists' median annual earnings were 70 percent greater than those of their nonunion counterparts.[289] Among non-construction laborers, 46 percent of whom were organized, the union premium was 48 percent.[290] Among unionists, construction laborers' earnings were 13 percent greater than those of their non-construction counterparts, whereas those of nonunionists in construction were actually 1 percent lower than their non-construction counterparts.[291] Nonunion construction laborers thus received no additional compensation for subjecting themselves to a significantly higher risk of being killed on the job than their non-construction counterparts. Although unionized construction laborers were able to extract a greater premium vis-à-vis their nonunion competitors than any other occupational group, their premium over the wages of their non-construction counterparts, who face a much smaller chance of being killed, is modest.

Modified surveys for 1977 and 1980 compared mean weekly earnings of full-time workers who were and were not represented by labor organizations (the data for 1980 are in parentheses). The earnings premium of the 40 (47) percent of construction laborers who were represented was 55 (34) percent vis-à-vis the unrepresented; among non-construction laborers the corresponding figures were 46 (45) percent and 50 (44) percent. Represented construction laborers' earnings were only 12 (7) percent higher than those of their non-construction counterparts, whereas among the unrepresented the premium was 8 (16) percent.[292] By the end of the 1970s, organized construction laborers' earnings premium vis-à-vis the unorganized not only shrank, but ceased to be

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287. *Supra* note 164, *Injury Hazards in the Construction Industry* at 140-41. The figure for non-construction laborers is estimated because it had to be read off a graph.

288. Toscano & Windau, *supra* note 172, tbl. 5 at 44.

289. The union premium for wage rates among construction laborers ranged between 40 and 70 percent in the early 1970s. BUREAU OF LABOR STATISTICS, U.S. DEPT. OF LABOR, BULL. NO. 1853: INDUSTRY WAGE SURVEY: CONTRACT CONSTRUCTION, SEPTEMBER 1972, at 6 (1975); BUREAU OF LABOR STATISTICS, U.S. DEPT. OF LABOR, BULL. NO. 1911: INDUSTRY WAGE SURVEY: CONTRACT CONSTRUCTION, SEPTEMBER 1973, at 5 (1976).

290. Among all full-time laborers (that is, handlers, equipment cleaners, helpers, and laborers), the union premium on median weekly earnings ranged from 58 percent to 76 percent between 1983 and 1992. BUREAU OF LABOR STATISTICS, U.S. DEPT. OF LABOR, BULL. NO. 2340: HANDBOOK OF LABOR STATISTICS, tbl. 42 at 163-68 (1989); EMPLOYMENT & EARNINGS, Jan. 1992, at 231; EMPLOYMENT & EARNINGS, Jan. 1993, at 241.

291. Calculated according to BUREAU OF LABOR STATISTICS, U.S. DEPT. OF LABOR, Rep. 417: SELECTED EARNINGS AND DEMOGRAPHIC CHARACTERISTICS OF UNION MEMBERS, 1970, tbl. 6 at 13 (1972).

292. BUREAU OF LABOR STATISTICS, U.S. DEPT. OF LABOR, Rep. 556: EARNINGS AND OTHER CHARACTERISTICS OF ORGANIZED WORKERS, MAY 1977, tbl. 10 at 30 (1979); BUREAU OF LABOR STATISTICS, U.S. DEPT. OF LABOR, BULL. NO. 2105: EARNINGS AND OTHER CHARACTERISTICS OF ORGANIZED WORKERS, MAY 1980, tbl. 10 at 30 (1981). The 1977 and 1980 results are not comparable with those for 1970.

an outlier.

Recent empirical psychological experiments have further undermined the plausibility of the Smithian compensation doctrine. The crucial concept here is the disparity between the willingness to buy and the willingness to sell or accept an entitlement.[293] Consider a worker whose weekly wage is $300 and faces a 1 in 1,000 risk of being injured. When asked by her employer, who controls the workplace and thus owns the entitlement in question, how much she would be willing to pay the employer to introduce changes that would reduce that risk to 1 in 10,000, she offers $30. Now consider the (counterfactual) case in which the worker owns the entitlement and the employer must secure the worker's consent to changes in the process of production that would bring about an increase in injury risk from 1 in 10,000 to 1 in 1,000. Extrapolation from analogous experiments suggests that the smallest bribe that the worker would demand might be more than one order of magnitude larger than the largest amount she is willing to pay for a proportionate increase in safety.[294] The first survey of willingness to exchange money for increases or decreases in workplace fatal accident risks, though methodologically biased toward underestimation, nevertheless found that respondents demanded almost three times as much in annual wage increases to accept an increment in risk as the wage that they would forego to obtain a decrement of the same magnitude.[295]

This kind of disparity between willingness to pay and willingness to sell is driven by several forces. First, although universal marketization and the concomitant formation of a market price may induce people to value fungible commodities more or less identically whether they are buying or selling, this tendency vanishes with regard to a unique, non-reproducible good such as health and safety. Here people "are usually willing to sell the right to be free from increased mortality risks for considerably more than they are willing to pay for reduced mortality risks." Thus a second way of explaining the disparity is that contrary to Coase's theorem, which assumes that outcomes are independent of the initial assignment of the entitlement as between buyer and seller, "most of us can demand much more in a bargain in which we are asked to sacrifice something of great value to which we have a 'right' than we can afford to pay for that same thing if someone else has the right to take it from us."[296]

Finally, disparity between buying and selling valuations also results from the diminishing marginal utility of income and/or the asymmetrical valuation that market participants attach to losing already realized income and receiving additional income.

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293. For early welfare economics recognition of the phenomenon in a different context, *see* A. Henderson, *Consumer's Surplus and the Compensating Variation*, 8 REV. ECON. STUD. 117 (1941).

294. Mark Kelman, *Consumption Theory, Production Theory, and Ideology in the Coase Theorem*, 52 S. CAL. L. REV. 669, 682 (1979); Jack Knetsch & J. Sinden, *Willingness to Pay and Compensation Demanded: Experimental Evidence of an Unexpected Disparity in Measures of Value*, 99 Q.J. ECON. 507 (1984); Jack Knetsch, *The Endowment Effect and Evidence of Nonreversible Indifference Curves*, 79 AM. ECON. REV. 1277 (1989); Herbert Hovenkamp, *Legal Policy and the Endowment Effect*, 20 J. LEGAL STUD. 225 (1991).

295. Shelby Gerking et al., *The Marginal Value of Job Safety: A Contingent Valuation Study*, 1 J. RISK & UNCERTAINTY 188, 192 (1988). Those who chose to respond to this lengthy and complex mail questionnaire were probably disproportionately high-income persons in low-risk jobs. The fact that almost one-quarter of respondents were willing to assume a riskier job without any monetary inducement suggests that they may have failed to understand the questionnaire. Finally, the questions themselves, which referred to a hypothetical and vague external comparison with the risks attaching to other jobs, lacked the concreteness of an internal comparison with the respondent's own current work.

296. MCGARITY & SHAPIRO, WORKERS AT RISK, *supra* note 55, at 273.

Consequently, losing income equal to 10 percent of a given standard of living diminishes satisfaction considerably more than a 10 percent rise in income would increase satisfaction. Thus if workers whose existing budgets exhaust their income were required to buy safety entitlements with income they already have, but had to sell such entitlements for additions to current income, it is plausible that the price at which they would be willing to sell would exceed that at which they would buy.[297]

Since all wage-premium studies are implicitly based on the real-capitalist premise that the employer owns the entitlement,[298] they must significantly understate the premium that would result from a system in which workers held workplace safety and health entitlements and employers were the supplicants. Consequently, "the economic positivist's methodological insistence on propositions that can be tested creates a strong bias, not merely in favor of markets, but also in favor of the status quo assignment of entitlements."[299] To be sure, in a full-employment economy workers might hold a market-based entitlement to avoid dangerous jobs such that competition for labor would compel employers either to improve working conditions or to raise wages sufficiently to induce workers to sell that right.[300] Absent such a transformation of capitalism, however, the pseudo-positivist fictional reconstruction of implicitly bargained-for compensating wage differentials not only atavistically resurrects the patently unrealistic and biased judicial doctrines of the pre-workers' compensation period, but also logically supports dismantling OSHA's incipient transformation of the fictitious industrial safety and health market into a non-transferable entitlement. President Reagan's Council of Economic Advisers, for example, adopted a position embodying all of these elements.[301]

Employers' cavalier and almost aggressive admission of the unreality of the Smithian assumption of a perfectly competitive labor market is tragicomic. Thus in congressional testimony reminiscent of the vindication of the equal right of the rich and poor to sleep under bridges, the president of the Associated General Contractors of America (and future governor of Mississippi) was asked whether a construction worker who is asked by an unscrupulous employer to go into a ditch lacking supports has the right to refuse. Kirk Fordice replied: "Yes, sir, I certainly do. He has to risk his employment, I presume, in that situation. But certainly, any individual should have that right."[302]

In spite of this brazenly stripped-down version of freedom, which amounts to little more than the absence of slavery—and, in addition, misstates the law since, under certain exigent circumstances, workers are entitled to refuse to subject themselves to unsafe conditions although they may have to spend years vindicating that right[303]—construction is said to provide concrete historical examples of the Smithian

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297. *See* Herbert Hovenkamp, *Marginal Utility and the Coase Theorem*, 75 CORNELL L. REV. 783, 798-804 (1990).

298. *See, e.g.*, Alan Marin & George Psacharopolous, *The Reward for Risk in the Labor Market: Evidence for the United Kingdom and a Reconciliation with Other Studies*, 90 J. POL. ECON. 827, 834-36 (1982).

299. Hovenkamp, *supra* note 297, at 804.

300. *See* MAURICE DOBB, WAGES 140-41 (1966) (1928); MARTIN WEITZMAN, THE SHARE ECONOMY: CONQUERING STAGFLATION 121 (1984).

301. ECONOMIC REPORT OF THE PRESIDENT 179, 195-201 (1987).

302. *Legislative Hearings, supra* note 246, at 490.

303. 29 C.F.R. § 1977.12 (1993); Whirlpool Corp. v. Marshall, 445 U.S. 1 (1980). *See generally*, James Atleson, *Threats to Health and Safety: Employee Self-Help Under the NLRA*, 59 MINN. L. REV.

compensatory mechanism. Thus according to Stanley Lebergott, a leading labor statistician and economic historian:

> [A] mighty influence buoying up wages paid to the men building canals during the 1820s and 1830s was the danger of yellow fever and malaria. Built through marsh and swamps . . . to reduce construction problems, the canals were known as killers . . . . In upstate New York in the 1830s and 1840s grown men received $10 to $12 for farm work, but thirteen-year-old boys driving an Erie canal boat through the regions where hundreds died during the cholera season were paid as much. With boys customarily being paid markedly less than men, and certainly for less arduous work, the differential presumably reflected the dangers of cholera and malaria associated with being a "canawler." The allowance for unhealthy working conditions was a quite explicit part of entrepreneurial calculations.[304]

How a few dollars compensated a child for his failure to survive beyond the age of thirteen remains unclear.[305] It is this perspective, which regards work injuries not as a societal problem but "at most as an economic problem," that became incorporated in workers' compensation statutes.[306] As advocates of workers' compensation programs during the Progressive Era were wont to stress: "For the . . . delirium of terror in the fall through endless hollow squares of steel beams down to the death-delaying construction planks of the rising skyscraper . . . there can be no compensation."[307] Continuous with this emphasis on the inherently nonfungible, nonexchangeable, and noncompensable nature of physical and mental well-being is the reaction of (the adult children of) unionized miners. From an industry that perpetuated "the notion that the added production costs of available safety procedure were less acceptable than continued death" they demanded not additional compensation for exposing themselves to the risk of "never coming out" alive and thus joining the more than 100,000 miners who have been killed in this century, but safer conditions.[308]

In order to dull this insight into the incommensurability between life and money, "[a] discourse and institutional practices are needed to harmonize the [employer-employee] relationship so that the blood-money exchange can be conducted without calling into question the moral basis of the relationship within which the suffering was created."[309] In the latter part of the twentieth century, entrepreneurial opposition to state intervention such as OSHA has coalesced with a broader based ideology and practice of universal marketization to resurrect the requisite discourse. The Smithian model of perfect competition presupposes the absence of external economies such that each agent bears all the costs of its decisions.[310] Yet the failure of firms to internalize

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647 (1975). On the somewhat less risky choices facing workers under a strong union contract, *see* BACOW, BARGAINING FOR JOB SAFETY AND HEALTH at 74, 141 n.19.

304. STANLEY LEBERGOTT, MANPOWER IN ECONOMIC GROWTH: THE AMERICAN RECORD SINCE 1800, at 250-51 (1964).

305. For experiments showing that some workers will decline certain kinds of work (such as handling TNT) regardless of the wage premium, *see* W. Viscusi & Charles O'Connor, *Adaptive Responses to Chemical Labeling: Are Workers Bayesian Decision Makers?* 74 AM. ECON. REV. 943, 949, 953 (1984).

306. Friedman & Ladinsky, *supra* note 96, at 71.

307. WILLIAM HARD ET AL., INJURED IN THE COURSE OF DUTY 37, 38 (1910) (1908).

308. Franklin, *supra* note 220.

309. Bale, *supra* note 51, at 54.

310. *See* William Dickens, *Occupational Safety and Health Regulation and Economic Theory*, in LABOR ECONOMICS: MODERN VIEWS 133, 135 (William Darity, Jr. ed. 1984).

the entire economic—let alone social—cost of the injuries caused by their operations underscores the fundamental difference in the way capitalist economies and their legal systems treat the productive wear and tear of human beings on the one hand and the means of production on the other. In order to spread the cost of a large and risky investment in machines over as many product units as possible before that equipment becomes obsolete, firms have an incentive to operate them as quickly and as continuously as possible. "Capitalistic enterprise thus naturally tends toward a long working day and week. This, however . . . produces fatigue among employees."[311] To replace deteriorated assets and thus to maintain the value of their capital investment intact, firms include depreciation charges in their prices: "[N]o owner of durable factors of production would be willing to make use of such agents, if some provision were not made to compensate him for the deterioration of his asset."[312]

Why can human agents not make similar charges for their physical impairment? After all, as a commissioner of the California Industrial Accident Commission observed of the toll incurred in one of the early years of workers' compensation: "When we kill in industry 23,000 men we have wiped out a property value of the Nation."[313] Why is it that "[i]f instead of 20,000 workers, 20,000 head of cattle were exposed to certain death . . . , there would be an easily calculable incentive to adopt required preventive measures?"[314] Or as the United Brotherhood of Carpenters put it mechanistically: "The injured workman is just as much an incident of the modern factory, as is the damaged machine. Both are proper items of operating expense, and should come out of the employers' profits. The only capital of the employee is his labor power."[315]

An historical example straddling capitalist and slave societies makes such "entrepreneurial calculations" easier to grasp: 600 Irish immigrants died annually in the 1830s digging the Ponchartrain canal in the "fever-racked swamps around New Orleans" in pursuit of sixty cents more an hour than railway construction near Philadelphia paid because no slave owner would consider permitting his $900-slave to perish for such a price.[316] Because the individual worker, as self-owned, lacks capital value,[317] her inferior bargaining position, especially in periods of high unemployment, makes it difficult for her to have her "claim to special financial compensation in case

311. DAUGHERTY, *supra* note 198, at 117-19.

312. K. WILLIAM KAPP, THE SOCIAL COSTS OF PRIVATE ENTERPRISE 48-49 (1971) (1950).

313. BUREAU OF LABOR STATISTICS, U.S. DEPT. OF LABOR, BULL. NO. 304: PROCEEDINGS OF THE EIGHTH ANNUAL MEETING OF THE INTERNATIONAL ASSOCIATION OF INDUSTRIAL ACCIDENT BOARDS AND COMMISSIONS at 62 (A. Pillsbury).

314. KAPP, *supra* note 312, at 65.

315. *Supra* note 264, at 133.

316. LEBERGOTT, MANPOWER IN ECONOMIC GROWTH at 250-51. Such entrepreneurial calculations appear to be anticipatory corroboration of a much later claim that: "Under capitalism there are no accidents—there is only murder of one class by another." *Capitalism Kills 51 Workers, supra* note 203.

317. A recent revision of the Internal Revenue Code takes the distinction between capital and human capital to its illogical conclusion. Congress included among the intangibles with respect to which firms are entitled to take amortization deductions a "workforce in place." Omnibus Budget Reconciliation Act of 1993, Pub. L. No. 103-66, § 13261, 1993 U.S.C.C.A.N. (107 Stat.) 312, 533 (to be codified at 26 U.S.C. § 197). Thus a firm may amortize over a 15-year period the portion of the purchase price of a business attributable to the "experience, education, or training . . . of a highly skilled workforce," although neither the individual members of that purchased workforce nor any other workers are entitled to take amortization deductions for the value of their cash outlays for that human capital, which they embody. H.R. CONF. REP. NO. 213, 103d Cong., 1st Sess. 675, reprinted in 1993 U.S.C.C.A.N. 1088, 1364.

of hazardous occupations recognized by the entrepreneur."[318] Until society at large, by means of comprehensive intervention, imposes full internalization of social costs on firms and empowers workers to assume responsibility for their own health and safety by shaping their working conditions, employers will continue to have an economic incentive to economize on the use of their fixed capital by churning their labor force and replacing worn-out workers with as yet unimpaired ones.[319]

In a democratically organized society, complete injury data would enable workers and consumers to deliberate on what to produce and how to produce it in order to avoid or limit products created in production processes that according to society's conscious determination unduly infringe on producers' physical and mental integrity.[320] Accurate fatality statistics remain "good stuff" to start that revolution with too.

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318. KAPP, *supra* note 312, at 49-50.

319. 3 MARX, DAS KAPITAL at 87-107. Not among the incentives that capital has in disregarding its workers' welfare is the "expropriation" of their health. Vicente Navarro, *The Labor Process and Health: A Historical Materialist Approach*, 12 INT'L J. HEALTH SERVICES 5, 13 (1982). Since the workers' loss of their health is not accompanied by its centralization on capital's side because it has been destroyed rather than transferred, such rhetorical flourishes in fact invert Marx's use of *expropriation*. 1 KARL MARX, DAS KAPITAL: KRITIK DER POLITISCHEN ÖKONOMIE, in 23 MARX & ENGELS, WERKE 789-91 (1962) (3d ed. 1883).

320. *See, e.g.*, W. CARSON, THE OTHER PRICE OF BRITAIN'S OIL: SAFETY AND CONTROL IN THE NORTH SEA 42-79 (1982); William Graebner, *Doing the World's Unhealthy Work: The Fiction of Free Choice*, HASTINGS CENTER REPORT, Aug. 1984, at 28.