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Barre, Vermont Granite Workers and the Struggle Against Silicosis, 1890–1960

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The Vermont city of Barre, as the center of granite production in the state, provides a useful case study of the effects of technological change on a large local workforce. The introduction of pneumatic stoneworking tools in the late 19th century began a lengthy and tragic effort by granite workers to protect their health against the effects of technology. The high levels of dust produced by the pneumatic tools lodged microscopic shards of sharp granite dust in stoneworkers' lungs, and, as the tools became widely used in the early years of the 20th century, granite workers developed debilitating lung disorders in large numbers; many died young from a disease known as silicosis.

Literature on Barre's granite industry examined its economic impact or the social relations and the class conflict that erupted between unionized workers and the granite industry owners. Some studies recognized the harsh realities of the long struggle for dust control; others looking at the horrors of silicosis saw only the eventual triumph of enlightened cooperation between employers, employees, medical professionals, and government regulators.[1] Unfortunately, government was slow to respond and often seemed overawed by the power of business to set the terms of the debate. The medical profession was itself subject to political manipulation by manufacturers with a large stake in the debate on dust control in their industries. The result was a solution to the problem of silicosis that was tailored to the interests of employers, not laborers.[2]

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[1]See Otto T. Johnson, "The Labor Situation in the Granite Industry in the Barre District, Vermont" (unpublished Ph.D. thesis, American University, 1928); Peter B. Liveright, "Unionism and Labor Relations in the Granite Industry, Barre, Vermont" (B.A. thesis, Goddard College, 1943); Sidney J. Bertrand, "A Survey of Graniteville Branch #12 Quarry Workers Union: 1922–1941" (M.A. essay, University of Vermont, 1966); Paul Demers, "Labor and the Social Relations of the Granite Industry in Barre" (B.A. thesis, Goddard College, 1974); Marion MacDonald, "The Granite Years: Barre, Vermont 1800–1900: A Socio-Economic History Using Quantitative Methods" (M.A. essay, University of Vermont, 1977); Ann Banks, ed., *First-Person America* (New York: Alfred A. Knopf, 1980), 93–119; Richard Hathaway, "Men Against Stone: Work, Technology, and Health in the Granite Industry," in Gene Session, *Celebrating a Century of Granite Art* (Barre, VT, 1989), 16–24; Rod Clarke, *Carved in Stone: A History of the Barre Granite Industry* (Barre: Rock of Ages, 1989).

[2]David Rosner and Gerald Markowitz, *Deadly Dust: Silicosis and the Politics of Occupational Disease in Twentieth-Century America* (Princeton: Princeton University Press, 1991); Wendy Richardson, " 'The

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The political struggle leading to industry regulation can be clearly demonstrated by focusing on the city of Barre. As granite workers repeatedly tried to address the issue of the dust hazard in Barre they faced determined opposition from most of their employers and outrageous inaction from a largely indifferent state bureaucracy. The politics of dust control in Vermont's granite industry reveals the extent to which state reforms were tied to the exigencies of national politics. The medical profession, beginning in the Progressive era and pushed by the aid of New Deal-era federal cooperation and the revival of union strength, finally helped alleviate the problem. While clearly most of the progress for regulation of the dust hazard came with the intervention of public health physicians, key questions concerning the politics of state regulation of the granite industry in Vermont need to be answered. What did the granite workers themselves do to address the health problems they faced? To what extent did the Granite Cutters' Union pressure the state and the medical profession for action? What political forces converged to force regulation of the granite industry?

Growth of the Barre Granite Industry

In the early 19th century, Barre granite was often used for minor building components such as door steps and foundation stones, and only occasionally for major projects. But it came into much greater demand when Gilded Age styles mandated larger and heavier buildings with elaborate architectural features. Ornate monuments and grave stones also provided a growing market. The decisive impetus for the development of the granite industry on a large scale was the coming of the railroad, which allowed the heavy stone to be more easily transported to distant construction sites. In the last decade of the 19th century the industry's expansion accelerated; by 1893 a pamphlet published in Barre listed 31 prominent examples of monuments and buildings constructed of Barre granite.[3]

During the first half of the 20th century, Barre was the largest granite center in Vermont and one of the highest volume granite producing areas in the United States. Production in Barre drove the state's competitive position in the market as it vied for first place with Maine, Massachusetts, and Georgia for many years. By 1924, the estimated value of granite produced in Barre was $8,000,000.[4]

As the granite industry grew, so did Barre. A village of between 2000 and 2700 in 1880, the city grew to about 12,000 by 1910. Much of the increase in population was due to an influx of stonecutters and quarry workers from the stoneworking areas of northern Italy, attracted to Barre by the prospect of better wages and by ideas of political freedom. They represented perhaps the largest ethnic minority in Barre by 1914. Another large group of immigrants to Barre came from the stoneworking Aberdeen region of Scotland; other nationalities joining the "native" Yankees included Swiss, Irish, Spanish, Swedish, and French-Canadian.[5]

Curse of Our Trade:' Occupational Disease in a Vermont Granite Town," *Vermont History*, 60 (1992), 5–28.

[3]J. Henry Jackson, "Barre Granite," *Barre Presbyterian, Illustrated Supplement*, May 1893, 5–7; W.F. Scott, "The Granite Industry," *Interstate Journal*, July–August 1902, n.p. (Barre, Vermont: Barre Museum, Aldrich Public Library).

[4]S. Hollister Jackson, "One of Vermont's Great Industries," *Vermont Review*, 1 (Sept.–Oct. 1926), 61–2; George H. Perkins, *Report of the State Geologist on the Mineral Industries and Geology of Certain Areas of Vermont, 1909–1910* (Bellows Falls, VT: Gobie Press, 1910), 188–191.

[5]Faith Learned Pepe, *Vermont Workers, Vermont Resources: Clay, Wood, Metal, Stone* (Brattleboro, VT: Brattleboro Museum and Art Center, 1984), 10; Richard Hathaway, "Brotherhood of All Human Energies: Immigration to the Workers' Colony of Barre," in *Carlo Abate: A Life in Stone*" (Barre, VT: Barre Museum, Aldrich Public Library, n.d.), n.p.

Many Italian and Scottish workers brought to the granite quarries and finishing sheds not only their stoneworking skills but also their long traditions of labor militancy. Sometimes disagreements over political philosophy and strategy were divisive and class unity suffered, but the workforce was highly unionized and often combative in defense of its interests. The Barre local of the Granite Cutters' National Union was founded in 1886, and Barre served as national headquarters for the Quarry Workers' International Union from 1903. By the beginning of the 20th century, over 90% of Barre's workforce was unionized.[6]

Barre has perhaps the most militant working-class history of any Vermont city. Its working-class solidarity was evident in the city's election in 1912 of the first Socialist mayor in the state, and in the still-standing Socialist Hall that was built in the city in 1899, complete with "the original granite medallion bearing the arm-and-hammer and initials of the Socialist Labor Party."[7]

The city's history is filled with impressive radical connections. Emma Goldman visited Barre in 1907 and 1911. William "Big Bill" Haywood of the IWW spoke in Barre in 1909 and Eugene Debs visited the city in 1910. Ben Wilson, editor of the Socialist Party weekly *Appeal to Reason*, spoke in Barre on several occasions; Mother Jones gave a talk in 1915 in support of a losing strike by Barre's unionized retail clerks. In February 1912, about 35 children from the Lawrence strike were housed in Barre. During the Spanish Civil War, Barre's unions raised money for an ambulance which was then sent to the Republicans in support for their struggle against Franco's fascists.[8]

Working-class labor ferment in Barre, however, was not simply the result of radical ideology or the attitudes of immigrant workers. The struggle between granite workers and manufacturers revolved around concrete issues that were, quite literally issues of life and death for the workers, especially after manufacturers turned to new technology as a means of increasing productivity. Most of the employers had little concern for its effects on the laborers who used them.[9]

The Labor Process in the Early Years of the Granite Industry

Until the introduction of steam drills in the mid-1880s and pneumatic tools in the 1890s, every aspect of stoneworking was done by hand. Quarrying, shaping, finishing, carving, and sculpting were done with hand chisels and drills, mallets and sledge hammers, wedges, chains and derricks. Granite is extremely dense and hard—more so

[6]Pepe, 10–11; Kenneth D. Buckley, *Trade Unionism in Aberdeen, 1878 to 1900* (Edinburgh: Oliver and Boyd, 1955); Edwin Fenton, *Immigrants and Unions, A Case Study: Italians and American Labor, 1870–1920* (New York: Arno, 1975); Rudolph J. Vecoli, ed., *Italian American "Radicalism": Old World Origins and New World Developments* (New York: American Italian Historical Association, 1973). Italian anarchists favored direct action while Scots were more inclined toward socialism.

[7]Karen Lane, "A Passion for Knowledge and a Love for Dreams: Immigrant Artists of the Barre Area," in *Carlo Abate: "A Life in Stone,"* n.p.; Charles T. Morrissey, *Vermont: A History* (New York: W.W. Norton, 1984), 116.

[8]Roby Colodny, "Labor in Barre: 1900–1914," in *Vermont's Untold History* (Burlington, VT: Public Occurence, 1976), 15–17; Paul Demers, "Labor and the Social Relations of the Granite Industry in Barre" (B.A. thesis, Goddard College, 1974); Morrissey, 116; Pepe, 11; Bernard Sanders, ed., "Vermont Labor Agitator," *Labor History*, 15 (1974), 261–270.

[9]See David Montgomery, *Workers' Control in America* (New York: Cambridge University Press, 1979); Harry Braverman, *Labor and Monopoly Capital* (New York: Monthly Review Press, 1974); Rosemary Crompton and Gareth Jones, *White Collar Proletariat* (Temple University Press, 1984); Alan Dawley, *Class and Community: The Industrial Revolution in Lynn* (Cambridge, MA: Harvard University Press, 1976); C. Wright Mills, *White Collar* (New York: Oxford University Press, 1951).

than most stone. Every step in working it, from raw rock quarrying to finished product, was tough physical labor. For new quarries, the topsoil first had to be removed. In the 1880s this was often started with dynamite but still finished by hand. Once the soil had been stripped away, a derrick was erected for lifting the heavy blocks of stone. These were powered first by one or two men turning a crank and later by a horse "attached to a long 'sweep' and traveling in a circle." By the mid 1890s the derricks were operated by steam power.[10]

Granite quarrying was a labor-intensive process. A long line of holes was drilled in the rock with a sledge hammer striking pointed steel drills that looked somewhat like large awls. Once the holes were drilled to a sufficient depth to support them, wedges and shims were inserted and the pounding resumed until the rock split. Quarrying was not only hard work, but also extremely dangerous. The "third man" holding a drill, while two other men swung sledge hammers at the rate of 40 blows per minute, must have been constantly aware that one mistake by his coworkers could mean a smashed arm. Many serious accidents and several fatal ones occurred.[11]

Safety conditions in the granite industry did not improve in the early decades of the 20th century; in fact, they may have actually deteriorated. Interviews with retired workers revealed a neglect of safety precautions in the granite industry through the 1920s and 1930s. One worker recalled that four or five men with whom he worked were killed in the quarries. Another told of granite quarry companies eager to settle death claims out of court. In one case a company owner came directly to the house of the bereaved family with a check—with the price of the monument deducted. Vermont passed its first Workmen's Compensation law in 1915 but benefits were severely limited. Workers complained that the law placed a heavy burden on them for obtaining judgments against the employers and collections were difficult. Legislation allowing compensation for silicosis was not passed until 1951.[12]

Even as the new problem of dust grew in importance, old hazards of the trade persisted. A 1926 report to the Vermont Commissioner of Industries listed 32 fatal accidents at the granite quarries for the previous 12 years, omitting non-fatal accidents because they were too numerous to mention. A quick scan of the local newspaper for virtually any year reveals an abundance of accidents, of varying severity, involving Vermont granite workers. Moreover, the industry's safety record hardly improved through the latter half of the 1920s.[13] One factor in the accident rate was the fast pace of work. An observer noted in 1895 that "labor at the Barre quarries proceeds at a

[10]Mari Tomasi, "The Italian Story in Vermont," *Vermont History*, 28 (Jan. 1960), 77; George Ellsworth Hooker, "Labor and Life at the Barre Granite Quarries: A Brief Survey of Social Conditions" (unpublished paper, Barre, Vermont: Aldrich Public Library, 1895), 3.

[11]Hooker, 6–8; Scott, "The Granite Industry," n.p.

[12]"Accidents in Stone Quarries," *Quarry Workers Journal*, 19 (Oct. 1922), 1. The *Granite Cutters' Journal*, 49 (Jan. 1926), 24–25, contains a discussion of the more brutal aspects of the "American Plan." "A study of Certain Dusty Trades in Vermont" (Vermont State Department of Public Health, Division of Industrial Hygiene, 1948), 2; Jeffrey Lott, "The Quarry Workers International Union in Barre, Vermont: 1922–1933" (unpublished paper, Middlebury College, 1971), 5–6; Andrew E. Nuquist and Edith W. Nuquist, *Vermont State Government and Administration* (Burlington, VT: University of Vermont Government Research Center, 1966), 303, 427; *Report of the Commission* and the *Minority Report of the Commission to Study Occupational Disease Hazards in Vermont* (1948), regarding the fight for including workplace diseases in Vermont's Workman's Compensation law.

[13]Johnson, "The Labor Situation in the Granite Industry in the Barre District, Vermont," 7, 402–403. As late as 1938 the Quarry Workers' International Union complained about state inaction regarding workplace safety in a resolution addressed to Vermont's governor: John C. Lawson [president, QWIU] to Governor Aiken (Governor Aiken papers, Vermont State Archives), May 6, 1938. Banks, *First-Person*

comparatively high tension," adding that "many Scotchmen have come here from the granite industry in Aberdeen, Scotland. Some of these express the opinion that as compared with the old country the men here work harder, receive higher wages, spend more money and are no happier."[14] Barre's granite workers worked a full six-day week until 1903 when they succeeded in negotiating a Saturday "half-holiday" for the summer months. In the "old country" Saturday was a "half-holiday" before the 1890s. The five-and-a-half day week seems to have been the rule at least into the late 1920s. Granite workers had the nine-hour day beginning in 1890; ten years later the cutters worked an eight-hour day, a benefit the quarry workers also acquired by 1902.[15]

Once separated from the surrounding rock the huge blocks of granite were then lifted from the quarry by a derrick with chains and cables and loaded for delivery to the cutting sheds, where the stone took its final form for delivery to the customer. In Barre the quarries were on the hilltops outside of town and the sheds were in the valley near the city, a distance of about four miles.[16] Granite was hauled on heavy wagons (or in the winter on sleds) with teams of oxen or horses. Often as many as 20 and sometimes 30 or 40 oxen or horses hauled the heavy loads down the steep hills. Before the railroad arrived in Barre in 1875 teams hauled the granite 10 miles to the nearest railroad station. In 1888 the "Sky Route" was built, reputed to be the steepest traction grade railroad east of the Mississippi river, linking the quarries to the city of Barre. Once the stone arrived at the cutting sheds it was unloaded by derricks and given its finished shape and polish. The final step was the addition of the artistic pictorial carving and lettering.[17]

It was in the sheds that the new technology would have its most telling effects on health and safety as the pneumatic tools changed the risk factor for workers in the sheds. Before the arrival of pneumatic tools granite cutting in the sheds was far safer than working in the quarries. There was much less chance for sudden traumatic injury for the cutters than for the quarries. Pneumatic tools reduced this safety differential by introducing a new hazard: granite dust.[18]

America, 93–119, contains some of the interviews done in Barre for the Federal Writers' Project. These "life history narratives" remind us of the real people behind the statistics. One interview, found on 106, is especially poignant:

> A pal of mine, Sierra, was killed the summer after he got out of high school, working in his old man's shed. He was a swell ball player, a swell guy. He was going to college that fall if that stone hadn't clipped him. They was loading a truck when it fell. It crushed all the lower part of him from the waist down. The hell of it was it didn't put him out right away; he was conscious while they was getting that block off him. I'm glad I wasn't the guy that chained that stone.

[14]Hooker, "Labor and Life at the Barre Granite Quarries," 8.

[15]*Ibid.* See also: *Barre Daily Times*, Mar. 6, 1915, 1; Mar. 27, 1922, 1; and Johnson, "The Labor Situation in the Granite Industry in the Barre District, Vermont," 4, 37, 46, 51. A six-day, 54-hour work week was common for many industries through the 1920s.

[16]Various occupational categories subdivided the work in both the quarries and the sheds. Brief descriptions of these can be found in Albert E. Russell *et al.*, "The Health of Workers in Dusty Trades. 2. Exposure to Silicosis Dust (Granite Industry)," *U.S. Public Bulletin No. 187* (Washington, DC: USGPO, 1929), 10–13; Jackson, "Barre Granite," 7.

[17]Scott, "The Granite Industry," n.p. The skilled carvers were, of course, profoundly affected by the new technology. Ultimately, these artisans were replaced by machine operators (sand blasters, etc.) with less skill and at much lower salaries. See Ann Banks, 99.

[18]Otto T. Johnson, "The Labor Situation in the Granite Industry in the Barre District, Vermont," (unpublished Ph. D. dissertation, American University, 1928), 402–403; Peter B. Liveright, "Unionism and Labor Relations in the Granite Industry, Barre, Vermont" (B.A. thesis, Goddard College, 1943), 100; Russell *et al.*, "The Health of Workers in Dusty Trades," 10–11.

The Introduction of Pneumatic Tools

Pneumatic tools began to appear in the mid 1890s. Albert Russell of the United States Public Health Service wrote: "By 1905 the use of hand pneumatic tools was practically universal." Pneumatic tools adopted by the granite industry included plug drills, which came into use by 1905; surfacing or polishing machines such as the "bumper;" and pneumatic chisels for carving and lettering. Jackhammers arrived by 1919 and Leyner drills with hand-operated feed came in 1924. These drills were improved with the addition of automatic feed by 1928 but they did not entirely replace piston drills until 1933, when replaceable drill bits were introduced. The 1920s witnessed the introduction of various saws and sand-blasting equipment. By the time of Albert Russell's study in 1924–1926 skilled stone carvers were being rapidly displaced by pneumatic sand-blasting techniques and craft skills in stoneworking were becoming largely obsolete.[19]

The pneumatic tools *were* fast and efficient. Fewer workers were needed to handle the workload, and granite industry employment increased at a much slower pace than production. The two major union publications for granite workers, the *Granite Cutters' Journal* and the *Quarry Workers Journal*, occasionally commented during the early decades of the twentieth century in printed editorials and short articles on the growing scarcity of jobs in the granite industry owing to the effects of machinery. Workers not displaced by the pneumatic tools faced many new hazards from the power of compressed air tools, including eye injuries from flying chips of stone or steel, excessive noise, and problems with the workers' hands which were apparently related to the pressure or vibration of the tools. But these hazards paled in comparison with one that overshadowed all the other perils of the stoneworking trade.[20]

Silicosis Comes to the Granite Industry

Within only a few years of exposure to the higher levels of dust created by the pneumatic tools workers developed hacking coughs, recurrent colds, and pains in the chest. They also became "out of wind" with any exertion such as lifting, or "fast work," or running. Eventually, many workers developed what was first referred to as "stonecutters' tuberculosis." The condition which led to the tuberculosis was later recognized as silicosis, defined as

> a chronic disease of the lungs caused by breathing significant amounts of crystalline silica (quartz) in particulate form for prolonged periods of time. Silicosis is characterized anatomically by the development of small discrete nodules of fibrous tissue uniformly disseminated throughout both lungs. In its early stages, silicosis may produce no symptoms; in its later stages shortness

[19]J.H. Walbridge, "The Granite City," *Barre, Enterprise Special Illustrated Edition*, April 27, 1897, n. p. (Barre, VT: Barre Museum, Aldrich Public Library); Russell *et al.*, 9–10; Liveright, "Unionism and Labor Relations in the Granite Industry, Barre, Vermont," 2–3, cited in Richard Hathaway, "Men Against Stone: Work, Technology, and Health in the Granite Industry," in Gene Sessions, 20; Banks, 96, 113.

[20]Paul Demers, "Labor and the Social Relations of the Granite Industry in Barre" (B.A. thesis, Goddard College, 1974), 52. See, for example, the *Granite Cutters' Journal*, 40 (Nov. 1916), 12; 53 (May 1929), 6; and the *Quarry Workers Journal*, 11 (July 1914), 3; 23 (June 1927), 1; 26 (Oct. 1930), 3. Harry B. Ashe, *Evaluation of the Industrial Disease Problems in Vermont* (Montpelier, Vermont: State Board of Health, 1948), 23.

> of breath, decreased chest expansion, and lessened capacity for work, may be present, together with an increased susceptibility to tuberculosis.

Physicians believed that "simple," or uncomplicated silicosis was not communicable; it could cause extreme discomfort but it was not disabling in its early stages. In its later stages, silicosis was "like microscopic razor blades," the effects of which caused the victim to feel as if he were "drowning in his own blood," as one worker put it.[21]

The toll taken by silicosis and tuberculosis on the workers and their families was devastating. In the early years when the line between the two conditions was blurred, studies commented on the confusion among the workers as to whether "stonecutters' tuberculosis" or "granite cutters' consumption" was contagious or not. Often, out of fear for the safety of their families, workers would commit themselves to the city sanitarium prematurely, thus being deprived of the company of family and friends when they most needed them. Others took more drastic measures. In a 1974 interview, 75-year-old Mose Cerasoli spoke of his stonecutter father:

> We heard him say, and I heard him say, that before he'd ruin his family with a long illness he wouldn't live that long. And it can't be a coincidence that the day the doctor told him, "Louie, you'll have to stop working," it couldn't have been a coincidence that he shaved the next morning, which stone cutters and my father were not in the habit of doing; he shaved in the morning and put on his better clothes—generally he just wore a pair of overalls—and a train hit him. He stepped in front of the train.

Cerasoli added that his father "lived to be, what was considered then, a very old age for a stone cutter, 62."[22]

The struggle against this dreaded occupational hazard was a long one and began with concern about the discomfort caused by working in clouds of dust. By December 1903 advertisements for dust masks ("Spencerian Throat and Lung Shields") began to appear in the *Granite Cutters' Journal*. Apparently workers did not consider these devices efficient or practical. The dust problem was not a localized one; the entire work area was filled with dust. Interviews conducted by the Federal Writers' Project show that workers were clear about this. One worker stated that "sometimes the air was so full of dust you couldn't see the man next to you … I have gone to work in the morning and after a little while in the shed I couldn't recognize my own body. It was covered from head to foot with dust."[23]

The Granite Cutters' Union tried to alleviate the dust problem in negotiations with company owners. The granite cutters drew up a "Bill of Regulations" in 1903. Three articles in that document addressed the dust issue but in very weak fashion. Article seven reads like a concession to the owners: "Cutters must provide themselves with broom, and no air power to be used to remove dust unless by special permission." Two

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[21]Albert E. Russell *et al.*, 84–85; Mari Tomasi, *Like Lesser Gods* (Milwaukee: Bruce Publishing Co., 1949; reprint ed., Shelburne, Vermont: New England Press, 1988), 297; Andrew D. Hosey, *Control of Silicosis in Vermont Granite Industry: Progress Report* (Washington, DC: USPHS, 1957), 3; Betty Rogers, producer, "The Blood of Barre: A Portrait of the Granite Industry" (Windsor, VT: WVPR for National Public Radio, 1979).

[22]Sanders, 263–264.

[23]See, for example, *Granite Cutters' Journal*, 27 (Dec. 1903), n.p. This was the monthly journal of the Granite Cutters' National Union; Banks, 96, 105.

articles dealt feebly with attempts at prevention of dust.[24] Workers' attempts to find a remedy in cooperation with their employers were unsuccessful.

Realizing they needed to enlist outside help, granite workers began to argue publicly that the increasing dust levels were creating a health hazard. Union president James Duncan complained in February 1904 that the sheds were "splendidly equipped with all known appliances facilitating the output of granite, but they are generally lacking in one thing, mainly a means of ventilating dust which is produced in the course of granite cutting." In January 1905 the Granite Cutters' National Union in Barre petitioned the city council to invite a delegation from the State Tuberculosis Commission to give a presentation on the disease which was afflicting the workers. The union wanted the members of the commission to tour the granite sheds and see conditions for themselves. When the commission arrived in early February for the presentation, workers found it disappointing. The audience was told not to blame the quarry owners alone for the high rate of tuberculosis in Barre, as "there must be the personal attention of each man to himself and his manner of living."[25]

Workers clearly felt that effects of their "manner of living" were less important than the pneumatic tools. Studies later confirmed what the workers already knew: the tuberculosis rate had increased rapidly and proportionately with the industry's introduction and continued use of pneumatic tools. In Barre, the tuberculosis rate increased drastically in 20 years. Washington county, where Barre is located, had for decades the highest tuberculosis rate and the highest death rate in the entire state. One observer noted in 1928 that "the average life of the stonecutter is 42 years and his occupational life is about 20 years." A study conducted by the Vermont State Department of Public Health in 1937 indicated that

> Granite Cutters die approximately 11 years younger than other Vermont males; that silico-tuberculosis was the cause of 73% of the deaths among Granite Cutters, ... and that for the period from 1931 to 1936, 75.3% of the Granite Cutters and 63.8% of the other granite workers died from tuberculosis as compared to *3.5%* for the State average and *2.2%* for other Barre males (emphasis added).[26]

This sizable increase in tuberculosis deaths among Barre's granite workers was happening "at a time when a campaign by the National Tuberculosis Association was bringing tuberculosis from first down to seventh place as the leading cause of death in the United States." There was increasing discussion concerning tuberculosis in the *Granite Cutters' Journal*. In February 1908 the secretary for the union's Barre branch wrote that there was a

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[24]Otto T. Johnson, "The Labor Situation in the Granite Industry in the Barre District, Vermont" (unpublished Ph.D. dissertation, American University, 1928), 58.

[25]*Granite Cutters' Journal*, 28 (Feb. 1904), 2, cited in Demers, 53; *Barre Daily Times*, Feb. 10, 1905, 1. Disappointment was expressed by the Granite Cutters' Barre secretary in the *Granite Cutters' Journal*, 29 (July 1905), 4. One presentation was too anecdotal, the other too technical, "well garnished with Latin words and phrases."

[26]International Labor Organization, *Silicosis: Records of an International Conference Held at Johannesburgh, South Africa* (London, August 13–17, 1930), 547, cited in Demers, 52–54. See the *Vermont State Board of Health, Biennial Reports* (Rutland, VT: Marble City Press, 1910–1914), discussed in Liveright (B.A. thesis, Goddard College, 1943), 52–53, 103–104; D.P. Fletcher Plumley, "The Growth and Development of the Granite Industry in Barre, Vermont" (B.A. thesis, Norwich University, 1928), 24; R.R. Sayers, "Mortality Among Granite Workers," in B.E. Kuechle, ed., *Fourth Saranac Laboratory Symposium on Silicosis* (Wausau, WI: Employers Mutual Liability Insurance Company, 1939), 220–223.

> scourge claiming almost every granite cutter in this vicinity, before he reaches the age of fifty … Within the past two weeks, five of our members have been placed in mother earth with consumption. This rate of mortality ought to strike terror in the heart of every granite cutter.[27]

In mid-November 1909, granite workers decided to walk out in hopes of attaining some relief from the high levels of dust. The strike began in Northfield, a town about 12 miles from Barre. Granite cutters there were concerned about a drastic increase in dust caused by the use of a new pneumatic stone surfacing tool, the "bumper," introduced in the area early in 1909. They asked that use of the bumper be suspended for at least the winter months (until May 1) unless effective ventilation could be provided because the closed-up sheds made the dust unbearable. When the owners of Cross Brothers Company refused, the workers asked for arbitration as provided in the contract. When the company declined to even consider this legal option granite cutters, one by one, refused to use the tool.[28]

Since the Cross Brothers owners were members of the Barre Granite Manufacturers' Association the BGMA declared a lockout in the entire district, throwing approximately 4000 men out of work on the grounds that the Northfield workers violated the contract which provided for arbitration in lieu of strikes! The Manufacturers' Association was taking advantage of the winter slack season to discipline the workers and protect the owners' control of the labor process. Along with front page notification of the lockout the *Barre Daily Times* included a statement from Cross Brothers explaining that "plenty of water was supplied to use in laying the dust on the stone, which the machines stirred up."[29]

In January 1910 the BGMA offered to end the lockout if workers would be satisfied by the promise of more water to keep the dust down. The granite cutters refused that offer and the lockout became a full-fledged strike, with demands for a wage increase added to demands for better working conditions. On February 18 the manufacturers finally gave in. Bumpers were to be "laid aside" until April 1, used provisionally until June 1 and, if ventilation equipment had not been installed by then, the tool would be "laid aside permanently until ventilation equipment was designed." The victory does not seem all that clear-cut. In June 1910 as deadline for installation of the ventilation equipment approached, the secretary for the Barre branch of the union commented that

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[27]Hosey, 10; *Granite Cutters' Journal*, 31 (Feb. 1908), 4. That it *did* strike terror in the hearts of the granite workers was palpable enough for the members of a 1929 study of silicosis in Barre's granite industry. That study included an extended comment on a noticeable element of widespread fear among the granite workers, who did not want to be examined for the study. See Russell *et al.*, "The Health of Workers in Dusty Trades," 83. To some extent the fear resulted from the simple fact that workers did not want early news of their ultimate fate. But part of the workers' fear of examination was that they could lose their jobs if found to be silicotic. Insurance companies had economic motives that stimulated their close attention to the health of granite workers. Lawsuits against employers were causing a crisis in the insurance industry, which responded by mandating the screening of workers and the firing of those found with signs of silicosis. Workers knew that physicians and insurance agents often worked for the employers' interests, not the workers. See David Rosner and Gerald Markowitz, *Deadly Dust: Silicosis and the Politics of Occupational Disease in Twentieth-Century America* (Princeton: Princeton University Press, 1991), 75–96.

[28]*Granite Cutters' Journal*, 34 (April 1910), 7; *Barre Daily Times*, Nov. 16, 1909, 1.

[29]The fact that the winter months represented a slow season for the granite industry was noted often in the *Granite Cutters' Journal*: 28 (Jan. 1905), 7; 29 (Nov. 1905), 3; 29 (Dec. 1905), 4; 49 (Dec. 1925), 8; and 49 (Jan. 1926), 8, to cite just a few instances. It was also noted by Russell *et al.*, 65; *Barre Daily Times*, Nov. 16, 1909, 1.

bumpers would be laid aside permanently soon, since no ventilation equipment was apparently forthcoming, and he observed

> One or two of the wide-awake tool manufacturers have recently gotten up a hand surfacer that weights under seven pounds … Our agreement does not call for a dust remover unless the machine or tool weighs over seven pounds, so this is a smart move on the part of the tool manufacturers.

Four years later, the secretary of the Barre branch of the Granite Cutters' Union argued again that the lack of ventilation was clearly causing an epidemic of tuberculosis and if the dust could not be efficiently ventilated shorter work hours should be obtained. He added that while some devices "remove dust from the immediate vicinity of a surface cutting machine, we have yet to hear of anything that will remove dust from the sheds."[30]

In 1915 a complicated strike included demands for dust removal but bitter differences among the workers weakened the union. Granite workers identifying themselves as "Italians, Spanish, Swiss, and Austrians" protested what they perceived as unfair control of the union by "the English speaking cutters." Union officials labeled the insurgents radical members of the IWW. The manufacturers took advantage of the workers' obvious divisions by refusing to sign the jointly negotiated agreement (which was approved by the union and awaiting final BGMA approval). The manufacturers based their repudiation of the agreement on their contention that a clause in the proposed contract prohibiting subcontracting to non-union plants was an illegal restraint of trade. The result was a significant defeat for worker safety on the job. The agreement, revised under pressure from the owners' association and signed by the divided and weakened union specifically stated that "Cutters must provide themselves with brooms and must use same for removing dust. No air power to be used for this purpose. Notices to this effect to be posted in sheds by employers." This meant granite workers were thrown back to the position in which they found themselves twelve years previously, in 1903.[31]

The Medical Profession Intervenes

While Barre's granite workers were losing their struggle to limit dust in the workplace, Progressive Era reforms in the field of public health were slowly beginning to make progress. The establishment of the United States Public Health Service in 1912 signified a more active role for the federal government in the protection of public health, but state and local efforts remained paramount for many years. And while Barre granite workers would ultimately benefit from the expansion of government involvement in public health, at least in documenting the need for regulation of the granite industry, Vermont lagged behind other northeastern states in the level of state activity.[32]

Physicians and voluntary associations initially took up the slack when state and

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[30]Demers, 58; *Barre Daily Times*, Feb. 19, 1910, 1; *Granite Cutters' Journal*, 34 (June 1910), 9; 38 (Nov. 1914), 9.

[31]*Barre Daily Times*, Mar. 6, 1915, 1, Mar. 29, 1915; Johnson, "The Labor Situation in the Granite Industry," 186–230.

[32]Michael E. Teller, *The Tuberculosis Movement: A Public Health Campaign in the Progressive Era* (New York: Greenwood Press, 1988), 21, 65. Vermont's State Board of Health, created in 1886, was equipped with a bacteriological laboratory two years later and expanded into a Department of Public Health in 1923. See Paul C. Dunham, *Vermont State Administrative Agencies*, n.d., 38, 102; Lott, "The Quarry Workers International Union," 6; Nuquist, *Vermont State Government and Administration*, 293.

federal intervention were slow in coming. Barre doctor D.C. Jarvis recognized early the need for dust control in the granite industry, arguing in 1923 that the importance of studying the health conditions presented by the granite workers was obvious, since "an analysis of the death certificates for the past twenty years indicated that *86 per cent* of the cutters died from tuberculosis."[33]

The National Tuberculosis Association sponsored a comprehensive study of silicosis among granite workers beginning in 1919, according to Dr. Jarvis, "because it was thought that the granite industry, of all the dusty trades, would show the highest mortality from tuberculosis." Dr. F.L. Hoffman was chairman of the Association's Committee on Mortality from Tuberculosis in the Dusty Trades, and under his direction the Committee issued a report on the granite industry in 1922. That report found that of 427 Barre granite cutters only 28 were unaffected by silicosis while deaths from tuberculosis were definitely associated with dust exposure, which was highest among granite cutters using pneumatic tools.[34]

Dr. Jarvis, an eye, ear, nose, and throat specialist, was associated with the Committee on Mortality as a participating physician. His report, published in 1923, discussing in detail the medical problems associated with granite dust inhalation provided valuable documentation of the silicosis problem in Barre's granite industry but, paradoxically, some of his conclusions in this study were potentially harmful to granite workers. Jarvis spent a good deal of time arguing that certain individuals exhibited physiological characteristics that pointed to a tendency towards respiratory illness while others did not. These susceptible individuals can be weeded out prior to their admittance as apprentices in the granite trade by a physical examination. Stating that "an occupation that is dusty does not justify the conclusion that affections of the respiratory tract are prevalent to a large degree," Jarvis concluded that if "affections" are prevalent in certain individuals "dust inhalation may not be the cause."[35]

Dr. Jarvis's argument upon close examination reveals an unexpected bias: the pseudo-scientific theme of biological determinism:

> … it is only during the past five years that an effort has been made to discover the type of individual who might be acceptable as an apprentice. This type represents a hazard which, if accepted, would soon break down in the industry

[33]D.C. Jarvis, MD, "The Upper Respiratory Tract in Granite Dust Inhalation," *Annals of Otology, Rhinology and Laryngology*, 32 (1923), 405–8 (emphasis added). According to Jarvis, the earliest recorded commentary on the effects of dust inhalation was in 1770. Modern research was pioneered by the British in 1912, with the publication of the *Preliminary Report of the Miners' Phthisis Prevention Committee of South Africa*. A *General Report* followed in 1916, and a *Final Report* in 1919. In 1917, Dr. A.J. Lanza published a report on silicosis among zinc miners in southwestern Missouri. See William McFarland, MD, "Silicosis and Tuberculosis as seen in the Granite Workers in Barre, Vermont," *Journal of Industrial Hygiene*, 9 (1927), 316–330. As early as 1908, John A. Gordon linked dust caused by pneumatic tools with consumption deaths in granite workers in Quincy, Massachusetts. See Teller, *The Tuberculosis Movement*, 106.

[34]Jarvis, 405; Hosey, 10.

[35]Jarvis, 408. Insofar as Dr. Jarvis' speculations could be used by others to delay the development of a consensus for regulation of dust, these ideas were harmful to the workers' interests on the ideological battleground, and ultimately to their lives. Jarvis may have felt he was standing in the middle as a neutral third party between granite workers and employers, thereby expanding the role of the medical profession into the area of industrial relations. [See Richardson, "The Curse of Our Trade," *Vermont History*, 60 (1992), 5–28.] But by screening workers and blaming them for illness, he was effectively taking the side of the employers. On the eugenics movement in Vermont, see Kevin Dann, "From Degeneration to Regeneration: The Eugenics Survey of Vermont, 1925–1936," *Vermont History*, 59 (1991), 5–29.

> and represent an economic loss to both industry and state … we are to tell the type of individual representing a hazard, and keep him out of the industry and select the individual who would do well … On the basis of suitable soil, it was found that the different nationalities lined up in a definite manner. In order of excellence they were found to line up somewhat as follows: Italians, Americans, English, … and Irish … It cannot be denied that, in the granite industry at least, the Irish are punished severely and it is a question whether they should be in a dusty trade, certainly not in the granite industry, as they represent a hazard, under present working conditions, and should not be accepted.

Reluctant to openly criticize granite company owners for the workers' health problems, Dr. Jarvis in effect gave the owners' economic interests co-equal status with workers' health and safety, thus blurring the focus of his work.[36]

Just as silicosis research was beginning to make some progress, at least in documenting the problem, the early 1920s brought an anti-union offensive by the granite company owners. In response to a post-World War I drop in profits the Barre Quarry Owners' Association announced in December 1921 that they intended to break the labor contract which would expire on April 1, 1922. Effective as of January 2, 1922 a 20% wage cut would be implemented and the "American Plan" would be official policy throughout the district.

Under the American Plan unions were entirely rejected on principle. The "American" way of labor relations was *individual* negotiations—the "freedom" of each worker to bargain with the employer as an independent agent. The owners, of course, did not follow this kind of plan, and retained their membership in various employer associations. The reality behind the equal opportunity rhetoric was that "open shops were normally closed nonunion shops, where a trade-union member who wore his affiliation honestly was either denied employment or fired."[37]

The secretary for the Barre branch of the Granite Cutters' International Association argued that the owners had planned implementation of the American Plan in Barre well in advance and never intended to bargain in good faith. The secretary stated that the union put forward "what is practically a health program" and sought "no increase in wages, no reduction of hours, but what are essential to our health." He complained that the manufacturers who closed the quarries were only concerned with cutting costs.[38]

The struggle over the American Plan in Barre was bitter. When the quarries reopened in early May only eight workers reported for work, all of them new to the Barre quarries. The open shop drive led to a standoff with roughly half of Barre's granite businesses surviving as union shops and the rest falling to the open shop. As a result of

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[36]Jarvis, 408–409; for a critique of this line of argument see Stephen J. Gould, *The Mismeasure of Man* (New York: W.W. Norton, 1981). Jarvis began writing in the *Granite Cutters' Journal* in November 1920; beginning in 1923 and continuing for many years he wrote a monthly "Medical Adviser's Column". Each month he answered queries from granite cutters regarding their respiratory health. The advice he rendered, however, was mostly in the realm of folk medicine. For coughs which developed from breathing dusty air, he recommended cod liver oil or mazola by the teaspoonful, plus baking soda and warm water! See the *Granite Cutters' Journal*, 48 (Sept. 1924), 23–24; 53 (June 1929), 16–17; 54 (Oct. 1930), 15.

[37]*Barre Daily Times*, Mar. 27, 1922, 1; Mar. 30, 1922, 1. See also: Sidney J. Bertrand, "A Survey of Graniteville Branch #12 Quarry Workers Union: 1922–1941" (M.A. essay, University of Vermont, 1966), 12–20; Irving Bernstein, *The Lean Years: A History of the American Worker, 1920–1933* (Boston: Houghton-Mifflin, 1960; reprint ed., Baltimore: Penguin Books, 1970), 147–148.

[38]*Granite Cutters' Journal*, 45 (Dec. 1921), 8–9.

the Red Scare which preceded and accompanied the manufacturers' offensive and the Great Depression that followed it, Barre's labor movement was seriously strained. It would take almost 20 years for the unions to recover to their 1921 level in the granite industry. Most tragically, this was also "the period of maximum dust exposure in the granite industry."[39]

During this dark period another mortality study on Barre's granite workers began that was to be even more definitive than the 1922 Hoffman report. Launched in 1924 by the United States Public Health Service, the study (published in 1929), was a detailed, documented, and damning report of conditions in the granite industry. The report described woefully inadequate ventilation of dust. The study found that the dust levels in the granite sheds were of such severity as to be second only to those found in coal mines. Pneumatic tools—used by at least 68% of the workers—had created the dust hazard. Workers who operated these tools were exposed to average dust levels of about 60,000,000 particles per cubic foot (mppcf), a level at which "100 percent of the workers had at least early signs of silicosis within 4 years." Maximum levels of over 200 mppcf were recorded. Also significant was the finding that the general plant atmosphere had levels of dust which ranged anywhere from 20 to 64 mppcf, leading to the conclusion that "none of the employees in this industry escapes exposure to a certain amount of dust."[40]

Exposure to the dusty environment of the granite sheds led to a great deal of general sickness among the workers. Those who suffered the greatest dust exposure also seemed to endure the most illness in general, complaining of influenza, frequent colds, and an undefinable "fatigue." And there was a high rate of long-term illness among the granite workers even though it was known that "in the case of prolonged sickness it was customary for the plants to drop the workers from the pay roll after a certain interval."

When workers were grouped according to the degree of dust exposure, it was shown that the largest single category of illness causing absenteeism, short or long term, was respiratory. The study's authors commented that "the association of sickness with the dust hazard could hardly be shown more concretely. Among hand pneumatic tool cutters with advanced length of service an average of 38 days was lost per person per year from all causes lasting two working days or longer." Perhaps most tragic was the finding that all this disease and death and lessened quality of life was unnecessary at the time the study was conducted:

> With a properly designed system of exhaust ventilation, it is possible to remove a large proportion of the dust, even without the use of an individual fan for each machine. This is borne out by surveys made elsewhere.

A presumed safe limit for dustiness was established at somewhere between 9,000,000 and 20,000,000 parts per cubic foot of air.[41]

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[39]Liveright, 24; Richard Hathaway, "Vermont and Unions: Myths and Realities" (Brattleboro, VT: Brattleboro Museum and Art Center, 1984); Vermont State Department of Public Health, Division of Industrial Hygiene, "A Study of Certain Dusty Trades in Vermont" (Montpelier, VT: Vermont Historical Society, 1948), 7–8.

[40]Albert E. Russell *et al.*, 7–8, 11, 28, 89; The *Granite Cutters' Journal*, 48 (April 1924), 8, noted that Russell's study was beginning in Barre. In 1931 a study confirmed that drill operators in the granite quarries also suffered from excessive dust inhalation and were contracting silicosis at alarming rates (Hosey, 12). See also Joseph Costello and William G.B. Graham, "Vermont Granite Workers' Mortality Study," *American Journal of Industrial Medicine*, 13 (1988), 483.

[41]Russell *et al.*, 20, 24, 28, 46, 62. Various forms of dust control equipment were available by this time but not widely used. The *Granite Cutters' Journal* in September 1924 included a six-page article which

As the end of the 1920s approached the need for dust control and the feasibility of its installation was becoming clear to the medical profession. Responding to the necessity for a more precise determination of the standards of dust exposure to be adopted and the methods of achieving them in the granite industry, the medical community, the National Tuberculosis Association, and the federal government cooperated more closely than ever before. In May 1927 a conference on the prevention of dust inhalation was held at the Harvard School of Public Health. Presentations at the conference underscored the need for dust control and its feasibility. Eliminating the dust problem in the granite industry was held to be the most pressing problem facing industrial medicine. The conference concluded with the news that the Committee on Problems in Industrial Medicine of the National Research Council in conjunction with the Harvard School of Public Health would conduct a two-year study on dust prevention with a budget of over $38,000.[42]

The report of the Harvard School of Public Health was released in the Spring of 1930 after nearly a year of field work. Its recommendations regarding permissible dust concentrations closely followed those advocated by Russell's published work but the chief contribution of this study was its careful refinements in the designs and specifications for dust ventilation equipment. With the resulting engineering standards there could no longer be any doubt about the efficacy of dust control in the granite industry.[43]

Meanwhile labor conflict in the Barre granite district slowed progress for dust control as management consolidated operations and moved to reduce labor costs. In February 1930, 10 granite firms merged with the Rock of Ages Corporation, which had a reputation as one of the most anti-union companies in Barre. The merger allowed the strengthened and centralized granite manufacturers to force successive wage cuts and then successfully resist the strike against those reductions three years later.

The strike, which began April 1, 1933, was bitter. The Rock of Ages management sent its employees a letter the day before the strike started, proclaiming that "no power on earth will ever compel us to operate our quarries or a single one of our plants on any kind of a union basis." About 150 state deputies escorted strikebreakers and patrolled the quarries and sheds. By May 7 Governor Wilson, who was alleged to have a close relationship with Rock of Ages management, ordered National Guard troops to Barre. The Governor kept the troops there, and even increased their number, against the stated wishes of the city administration. Barre was under martial law. National Guard troops marched down the city's streets, hauling machine guns for added intimidation. Deputies beat union organizers and pickets. The intense pressure on the strikers had a telling effect. Divisions appeared between the quarry workers and the granite cutters. The strike ended with mixed results. Arbitration led to wage reductions for some

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described dust suction devices. Some sources place the installation of a few exhaust fans at about 1914, others at 1916 or 1917, but the quality of the design of these fans was questionable, and maintenance was haphazard at best. See *Granite Cutters' Journal*, 48 (Sept. 1924), 1–6; Russell *et al.*, 8, 26–28; Robert B. Aiken, "Pioneers in Dust Control," *Modern Health Crusader*, 23 (Sept.–Oct. 1940), 1; Hosey, 14; Liveright, 106; and Edward C.J. Urban, "Ventilation in the Granite Industry," *Journal of Industrial Hygiene and Toxicology*, 21 (Mar. 1939), 59.

A limit is explicitly stated in Albert E. Russell, "The Health of Workers in Dusty Trades: Restudy of a Group of Granite Workers," *U.S. Public Health Bulletin No. 269* (Washington, DC: USGPO, 1941), 11. This is Russell's *restudy*, that began 12 years after the initial study noted earlier.

[42]*Granite Cutters' Journal*, 51 (1927), 16. An editorial supporting the study appeared on 5.

[43]*Granite Cutters' Journal*, 53 (1929), 13–14. The writer urged industry involvement in order to retain influence over legislation and regulation; *Granite Cutters' Journal*, 54 (1930), 14–20.

workers and the quarry workers union was severely weakened. Reduced union strength and lack of unity meant less effective pressure on employers for dust control.[44]

Silicosis and the New Deal Era

The coming of the New Deal represented hope for many workers faced with employer intransigence and granite workers were no exception. But New Deal programs were not automatically structured to favor workers; industrial and labor regulations had to be molded to the interests of workers in the face of opposing efforts by manufacturers. The National Industrial Recovery Act (NIRA), a clear example of this principle, was introduced in Congress in May 1933 and signed into law a month later. Title I, administered by the National Recovery Administration, suspended some aspects of antitrust laws, encouraged industries to fashion codes specifying various conditions of work such as wages and hours, and included Section 7 (a) which guaranteed workers' rights of labor organization and collective bargaining. Codes drawn up under the NIRA represented the interests of workers weakly. The Granite Cutters' Union first praised the NIRA for the protection they expected it to provide for workers. Within a few short months, however, both the Granite Cutters' and the Quarry Workers' unions began proposing revisions to the industry's version of a Code of Fair Competition in hearings before the National Recovery Administration (NRA). The unions' proposed revisions set high standards for dust control and advocated workers' compensation for silicosis where state laws (such as Vermont's) did not allow it. While union representatives produced some improvement in the codes, the industry got most of what it wanted.[45]

Business interests were able to steer the codes in their direction because they increasingly had the organized power to influence government agencies. The power of business organizations became even more formidable when channelled through industry associations, a trend that accelerated during the Progressive era with the formation of the National Civic Federation, the National Association of Manufacturers, the national incorporation of the Chamber of Commerce, and other groups. From 1913 the Mellon Institute of Industrial Research served as a research and umbrella organization for companies with an interest in industrial health. In early 1935 the Institute was instrumental in helping to form an especially effective organization of companies and industry associations with an interest in public policy relating to silicosis. The Air Hygiene Foundation, with a mission to protect the interests of members by setting the agenda on silicosis research, grew from 20 members to 168 members in less than a year and a half. In an era of limited funding for medical research the Air Hygiene Foundation was able to recruit medical, legal, and engineering professionals and embark on a program of research that represented "an amalgam of industrial need and scientific optimism." The Barre Granite Association was among the members, as was a company whose actions would finally bring silicosis to national public attention.[46]

[44] *Quarry Workers' Journal*, 29 (1933), 1; *Barre Daily Times*, Feb. 7, 1930, 1; Harry F. Ward [Chairman of the American Civil Liberties Union] to Governor Wilson, May 19, 1933, (Reel #S-3192, Governor Stanley Wilson papers, Vermont State Archives); Jeffrey Lott, "The Quarry Workers International Union in Barre, Vermont: 1922–1933" (unpublished paper, Middlebury College, 1971); Richard M. Judd, *The New Deal in Vermont: Its Impact and Aftermath* (New York: Garland, 1979), 133–35.

[45] *Granite Cutters' Journal* 52 (June 1933), 5; George Martin, *Madam Secretary: Frances Perkins* (Boston: Houghton Mifflin, 1976), 260–76; *Granite Cutters' Journal*, 58 (May 1934), 2; *Quarry Workers' Journal*, 29 (Nov. 1933), 1.

[46] *Granite Cutters' Journal*, 57 (July 1933), 1, 2; (Sept. 1933), 1–2; (Oct. 1933), 1–2, 5–6; (Feb. 1934), 2; Gabriel Kolko, *The Triumph of Conservatism* (New York: Macmillan, 1963); James Weinstein, *The Corporate Ideal in the Liberal State, 1900–1918* (Boston: Beacon Press, 1968); Rosner and Markowitz, 105–110.

Beginning in early 1935 and continuing through much of 1936 a tragedy of almost unbelievable magnitude made national headlines with a dramatic impact on the issue of silicosis. It was revealed that many hundreds of workers died and more were dying, mostly from acute silicosis, as a direct result of work performed for Union Carbide and its subcontractors on a tunnel near Gauley Bridge, West Virginia between June 1930 and December 1931. The extreme callousness of the companies' actions was underscored by the disclosure that company officials were fully aware of the inherent hazards of the project and deliberately neglected implementing health and safety precautions. The story was brought to light only after an investigation by a determined social worker was picked up by small political journals and newspapers. It came to the attention of New York congressman Vito Marcantonio, who arranged for subcommittee hearings in early 1936. With no funding and no subpoena powers for the subcommittee, however, the hearings lasted barely longer than two weeks. But in the *Granite Cutters' Journal*, government officials were quoted as saying that "legislation controlling occupational diseases has been advanced almost a decade by the thorough publicity accorded the silicosis deaths in West Virginia." Since the story ultimately was carried (though often with erroneous reporting) by the *New York Times* and several national newsweeklies, the hearings "indirectly achieved an objective of immense significance in awakening recognition of the need to protect workers exposed to silica."[47]

Secretary of Labor Frances Perkins called a National Conference on Silicosis only weeks after the House hearings. Already earlier Perkins had begun projects to stimulate concern. She had established in 1934 the Division of Labor Standards. The conference on silicosis was one of the projects sponsored by the Division, whose mission was to serve as a clearing house for reform and to standardize labor laws throughout the country. But the conference was dominated by representatives of industry groups, and companies who were members of the Air Hygiene Foundation. The main contribution of the conference, which did not immediately result in federal regulation, was its impact on the debate about silicosis. The Air Hygiene Foundation was successful in framing the issue on terms acceptable to industry and in forestalling the more aggressive measures favored by labor.[48]

An increasing number of lawsuits and compensation claims in the early 1930s by silicosis victims in several states led to calls from many quarters for increased state and federal involvement. In New York and other states, foundry, construction, insulation and other dusty industries, as well as insurance industry officials, began demanding state intervention to minimize the risk of court judgments. By June 1936 New York passed a compensation law that included silicosis, but the compensation rates were so low they drew the criticism of Secretary of Labor Frances Perkins, who called the benefits "meager."[49]

Vermont's state government continued to tread cautiously in dealing with the problem of silicosis, but in November 1936 the Vermont Department of Public Health began operating a Division of Industrial Hygiene. Initially started with only an engineer, after three months it had a staff composed of a physician, a sanitary engineer, and a secretary. The division began to deepen state involvement in the silicosis issue, cooperating with the Barre Granite Association, the unions, the Vermont Tuberculosis

[47]Martin Cherniack, *The Hawk's Nest Incident: America's Worst Industrial Disaster* (New Haven: Yale University Press, 1986); *Granite Cutters' Journal*, 59 (Feb. 1936), 4–5; *Granite Cutters' Journal*, 59 (Mar. 1936), 1.

[48]Martin, 420–25; Cherniack, 109–110; Rosner and Markowitz, 110–134.

[49]Rosner and Markowitz, 78–95.

Association, and the U.S. Public Health Service. One study conducted by the new state division in 1937 found that "dust conditions were essentially the same as reported in 1925." Other studies found high rates of silicosis and tuberculosis among Vermont's granite workers and faulty maintenance of dust removal equipment.[50]

Adopting the standard of 10 mppcf as an upper limit for dust, the Industrial Hygiene Division oversaw a program of dust control that emphasized the technological and engineering aspects of exhaust ventilation systems. In doing so, the state nixed a bid by the city of Barre to take an active role in regulating its local granite industry. The state senate in April 1937 killed a bill for local authority on the grounds that it would be too confrontational, that it would "force industry to do specific things," and thereby abrogate the "cooperative spirit" with "a club wielded by the Barre city council with the ever-present danger that politics might be injected into the problems." In July the state utilized federal funds provided by the U.S. Public Health Service (made available by the Social Security Act) to locate the headquarters of the state Division of Industrial Hygiene in Barre's city hospital building. There its staff proceeded to measure dust levels and test dust removal systems while examining workers for disease.[51]

This work developed into a follow-up study of Barre's granite industry by Albert Russell now associated with the United States Public Health Service. Revisiting his original work after a lapse of a decade, Russell and his team measured the effects of granite dust on many of the same workers who were examined in the earlier study in 1924–26. The importance of this new study cannot be overestimated. Russell seemed determined to clear away any remaining excuses for inaction. He dispensed with the argument of variable susceptibility based on nationality by reporting that "the incidence of silicosis and tuberculosis did not seem to vary significantly according to race." The study confirmed the findings of the original and explicitly tied the rising death rates to the adoption and use of pneumatic tools. Throughout the study Russell emphasized the importance of dust control for pneumatic tools, stating that "the rise in incidence of the disease … with length of service is so unmistakable and so rapid that there can be no question but that it is associated with the dust hazard of the industry." He added that death rates due to tuberculosis were "appallingly high." Perhaps the most important finding in the study was the narrowing of acceptable exposure levels:

> What appears to stand out most clearly is that a maximum of dust exposure, falling somewhere about 10 million particles per cubic foot of air for the dust-making occupations, for a dust which contains from 25 to 35 percent of free silica in the form of quartz, is a desirable limit, and that it can be obtained by the use of economically practicable ventilating devices applied to the source of the dust.[52]

The granite industry's response to the growing cooperation among unions and federal and state public health officials was slow. To speed dust-control efforts, granite workers determinedly pushed for dust-control measures rather than wage increases in contract negotiations. A new union contract in early 1937 included an agreement with

[50]Hosey, 12–13, 16–17; *Thirty-First Report of the State Board of Health of the State of Vermont* (Rutland, VT: Novak Printing Company, [1938]), 7, 9; *Thirty-Second Report of the State Board of Health of the State of Vermont* (Rutland, VT: n.p., [1940]), 4, 8–9; Edward C. J. Urban, "The Granite Cutting and Finishing Industry in Vermont," and L.E. Judd, "Clinical Picture and X-Ray Findings of Granite Shed Workers in Vermont," in *Fourth Saranac Laboratory Symposium on Silicosis*, 200–219.

[51]*Barre Daily Times*, April 10, 1937, 1; July 16, 1937, 1.

[52]Albert E. Russell, "The Health of Workers in Dusty Trades. 7. Restudy of a Group of Granite Workers," *U.S. Public Health Bulletin No. 269* (Washington, DC: USGPO, 1941), v–vi, 3–7, 70.

the manufacturers to install dust-removing equipment by September 1. The manufacturers claimed that they were in effect giving a raise to the granite cutters by agreeing to spend "thousands of dollars" on dust removal. While polishers, sharpeners, sawyers, and bedsetters received a wage raise of from 87 1/2 cents per hour to $1 per hour, the granite cutters (who already made $1 per hour) received no raise at all, but instead a promise to spend money on dust-removing equipment. But initially only a minority of manufacturers installed dust-control equipment. Most were slow to spend the money needed because they were afraid of falling behind in the profit competition with those manufacturers who did not install dust equipment. Finally, as one scholar has reported: "in 1937 the Granite Cutters' Union demanded the dust control equipment be installed by 1938, threatening to tie up the industry unless this was done."[53]

Manufacturers tried to use their promise to install dust-control equipment against their employees in testimony before the state legislature. Through the efforts of T. Tracy Lawson, executive secretary of the Barre Granite Association, they fought against a bill to increase benefits for accidental injury and death under the Workmen's Compensation law. Lawson testified before the state House and Senate committees on social security that the granite industry might be forced out of Barre if the owners had to increase their contribution for Workmen's Compensation because they could not compete effectively with granite manufacturers in the South. Lawson argued that the proposed increase failed to take into consideration both the higher wages and benefits provided by Barre's granite manufacturers and, as the local newspaper reported, "the recent agreement to raise wages in one branch over ten per cent and, in another branch, to install dust removal devices at heavy expense."[54]

The problem with Lawson's argument was that those improvements, the result of years of union agitation, were being implemented at a snail's pace. Lawson's testimony on behalf of Barre's granite manufacturers was taking place in March 1937, less than two weeks after the manufacturers made their "definite commitment to install dust removing equipment by September 1 of this year."[55] But that deadline was not met. The next Granite Cutters' Union agreement with the manufacturers extended the deadline to 1938. For quarry workers the delay was even longer. The Quarry Workers' International Union won an agreement with the Rock of Ages corporation in July 1938 for the installation of dust control equipment by June 1, 1939.[56]

Denouement of the Silicosis Issue

Once the physical means of removing dust in the granite sheds was devised and finally installed, Barre's granite industry followed a national trend as silicosis began to fade from public notice. Thought of as largely a technical issue, silicosis was widely considered a problem of the past by medical practitioners, scientists, granite manufacturers, and state regulators after the installation of dust-removal systems. This assessment was largely accepted by granite cutters and quarry workers, who saw less dust at their sheds and quarries. Beginning in the late 1930s industry spokespersons, business

[53]*Granite Cutters' Journal*, 60 (Dec. 1936), 3; *Granite Cutters' Journal*, 61 (April 1937), 3; *Granite Cutters' Journal*, 61 (Nov. 1937), 3; *Barre Daily Times*, Mar. 6, 1937, 1; Liveright, 43–44, 107.

[54]*Barre Daily Times*, Mar. 18, 1937, 3. A physician testified that Vermont's benefits were the lowest of 46 states. As already noted the system did not even cover silicosis.

[55]*Barre Daily Times*, Mar. 6, 1937, 1.

[56]*Barre Daily Times*, July 20, 1938, 1; *Granite Cutters' Journal*, 61 (Nov. 1937), 3; (Feb. 1938), 3; "Graniteville Dust Control Clause," Quarry Workers International Union of North America, 1938; *Quarry Workers' Journal* 33 (Oct. 1937), 1; Liveright, 108–109.

publications, and even public health physicians were concluding that silicosis was no longer an urgent problem. News about the issue in the general media became scarce; published articles about silicosis were written in a more technical and specialized style, making them less accessible to the general reader and even to the medical nonspecialist. In May 1939 a physician and an engineer from the Office of Industrial Hygiene in Barre gave a presentation at a Granite Cutters' Union meeting in which they stated that suction devices have "eliminated completely all dust hazards." Studies of Barre granite workers showed that silicosis was declining; most discussion of the issue soon revolved around the precise date of effective dust control. Political action in the legislature centered on the inclusion of silicosis in the state Workmen's Compensation system.[57]

But others had doubts that the problem was completely solved. A 1950 publication by the Bureau of Mines dissented from the consensus view that silicosis was a bygone issue, criticizing as inadequate and flawed every theory, standard, assumption, and technological measurement used to support laws and regulations regarding silicosis. The article received little attention even though it concluded that silicosis was still a clear and present danger. Another study published in 1956 concluded that while silicosis had declined it had not been completely eliminated. A few cases were being seen in younger men whose work histories began after 1935. The author cautioned that "we must consider that with less severe exposure silicosis may take longer to develop than in the past, a possibility that cannot be determined for some years." Locally, these studies were seconded by a 1957 U.S. Public Health Service report on Vermont's granite industry. It noted the progress achieved by state inspections and chest X-rays combined with a "self-inspection program" by manufacturers after the installation of dust control in 1939. But the study also found that dust control in the granite sheds was not really effective until after 1948, since prior to that year "air discharged from the [dust] collector was recirculated in most sheds." In the granite quarries, dust control was not effective until the practice of wet drilling was introduced in 1950. These findings highlighted the need for continued vigilance.[58]

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The fight against silicosis in Barre was taking place in a context that both helped and hindered progress to address the hazard. While unions, physicians, and some government officials had the goal of eliminating the danger of silicosis, manufacturers' associations gradually co-opted the work of scientific and medical professionals and steered government bureaucrats in the direction of industry's interests. Dust control may have solved the problem of silicosis in Vermont's granite industry, but occasional rumors of unsafe practices are cause for concern that silicosis could return, thereby re-acquainting us with the maxim that history repeats itself when we ignore its lessons.[59]

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[57]Rosner and Markowitz, 178–196; *Granite Cutters' Journal*, 63 (May 1939), 3; "A Study of Certain Dusty Trades in Vermont" (Division of Industrial Hygiene, Vermont State Department of Public Health, 1948); Andrew D. Hosey, *Control of Silicosis in Vermont Granite Industry* (Washington, DC: USPHS, 1957); Harry B. Ashe and Donald E. Bergstrom, "Twenty-Six Years' Experience with Dust Control in the Vermont Granite Industry," *Industrial Medicine and Surgery*, 33 (1964), 73–78; Costello and Graham, "Vermont Granite Workers' Mortality Study," *American Journal of Industrial Medicine*, 13 (1988), 483–497; Andrew E. Nuquist and Edith W. Nuquist, *Vermont State Government and Administration* (Burlington, VT: Government Research Center, University of Vermont, 1966), 302, 427; *Report of the Commission to Study Occupational Disease Hazards in Vermont* and *Minority Report of the Commission to Study Occupational Disease Hazards in Vermont* (1948).

[58]See Rosner and Markowitz, 196–198; Victoria M. Trasko, *"Some Facts on the Prevalence of Silicosis in the United States," AMA Archives of Industrial Health*, 14 (Oct. 1956), 386; Hosey, x, 17.

[59]Rosner and Markowitz, *Deadly Dust*, 181–212; Hathaway, "Men Against Stone," 21.