

FILE NAME: Industrial Hygiene Foundation (IHF)

DATE: 1995

DOC#: IHF035

DOCUMENT DESCRIPTION: Journal Article - Workers, Industry, and the Control of Information: Silicosis and the Industrial Hygiene Foundation

Workers, Industry, and the Control of Information: Silicosis and the Industrial Hygiene Foundation

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IN January 1933, Donald Cummings, a research scientist at the Saranac Laboratory, an independent research facility in upper New York State, received a letter from M. D. Harbaugh, the Secretary of the Tri-State Zinc and Lead Ore Producers Association, an industry trade group in Missouri, Kansas and Oklahoma. Harbaugh informed Cummings that the Association had decided to deny him the right to publish his study on "Silicosis Occurring in the Lead and Zinc Mines of Ottawa County, Oklahoma." The data, collected at a clinic organized by the mine owners in conjunction with the Metropolitan Life Insurance Company and the U.S. Bureau of Mines, reported on the prevalence of this disabling and often life-threatening occupational lung disease among the area's miners. Harbaugh's point was simple: Cummings could not publish the results because they were "potentially damaging to the lead and zinc mine operators of this district"(1). "There are now pending suits for hundreds of claims for total disability for occupational diseases," Harbaugh informed Cummings. If these suits were lost, "the mining companies now in existence here would have to bear the burden of paying for disabilities." Certainly, Harbaugh wrote, Cummings could "see what a brief your paper would be." . . . "The industry would be entirely wrecked if it were saddled with the care of everyone who might be persuaded to take action against it on the grounds of disability from silicosis"(2).

Cummings was dismayed that his two-years' worth of data on which Saranac Laboratory had spent "several thousands of dollars" was to be wasted. He appealed to Anthony Lanza, a prominent investigator who headed the occupational disease program at Metro-

J. of Public Health Policy
16(1):1995; 29-58

range of possible solutions, and the control of scientific data? How can technically trained individuals avoid real or perceived conflicts of interest? At what point does the ostensibly disinterested goals of professionalism conflict with the self-interest of the sponsoring organizations? How and under what circumstances does the sponsorship of research become important in evaluating the conclusions of technical studies?

The Industrial Health Foundation, an industry-sponsored group headquartered in Pittsburgh, has played a critical historical role in shaping the nation's agenda regarding industrial disease. It has been involved in a broad series of investigations into the causes, results, and policy implications of a wide range of occupational hazards. From its start as the Air Hygiene Foundation during the Depression, it has portrayed itself as an industry-sponsored agency that depended upon detached, disinterested professionals and experts to develop effective programs to address occupational disease. As an organization that brought together professional industrial hygienists, business groups, government officials, academics and researchers, it serves as a way for understanding the intertwining of industrial and academic agendas. Throughout its history it has sponsored colloquia, monographs and research into a host of occupational hazards. On the one hand, it has presented itself as impartial, seeking to develop policy and carry out research in the public interest. On the other hand, it was begun by, and has been closely associated with, industries directly affected by positions it has taken.

THE SOCIAL AND ECONOMIC CONTEXT OF THE SILICOSIS CRISIS

During the early 1930s, silicosis, a chronic industrial disease caused by the inhalation of silica dust, emerged as a serious crisis for American industrialists, insurance companies, and workers in foundries, mines, quarries, and other critical American industries. The disease had been recognized as an important occupational disease prior to the Depression. From the teens to the late 1920s, investigators from universities, the U.S. Public Health Service, some state departments of health, and insurance companies, documented the extent of silicosis among workers in diverse industries. But, before the Depression, it had never been portrayed as widespread and epidemic. By the 1930s, hundreds of thousands of American workers were said to

From the very first meeting, the Konicide Club was to be a compatible gathering of representatives of insurance companies, the silica-producing and using industries, equipment manufacturers, and academic and medical research institutes. The Club chose as the site for its second gathering the annual meeting of the National Safety Council in Washington, D.C. in October 1932, an organization that was involved in a controversy about its suppression of a report written by a prominent Yale professor, C.-E.A. Winslow, that suggested an extensive silicosis problem (13). "This was, perhaps, the first large gathering from U.S. industry before which representatives of the small group of pneumoconiosis specialists presented the dimensions of the silicosis problem and the needs for its control" (14).

The Konicide Club was among the first group of technicians who recognized the growing significance of the pneumoconiosis problem in the 1930s. In addition to silicosis they identified asbestosis as an important occupational condition (15). Yet, members recognized that outside support from industry was essential in order to have an impact in this field. Without such support it would be difficult for experts to gather information or find the means of financing studies into dust disease. William P. Yant, a member of the Konicide Club who also worked at the U.S. Bureau of Mines and later the Mine Safety Appliances Corporation, stated that the Konicide Club's meeting in Washington on January 13-14, 1935, "in a large measure could be considered as a rehearsal of the discussions for the Pittsburgh meeting" of what was to become the Air Hygiene Foundation (16). In addition to the Air Hygiene Foundation, the Konicide Club sought to establish close contact with the insurance and mining industries (17).

ORIGINS OF THE AIR HYGIENE FOUNDATION

Initially, the Konicide Club defined itself as a grouping of technical experts from a variety of public and private, academic and industrial concerns. But its interests were soon to become intertwined with the goals of the Air Hygiene Foundation. In late September 1934, as the insurance crisis deepened, Alfred Hirth, an attorney from Toledo, Ohio, who had devoted the better part of the past two years to the emerging silicosis crisis, approached representatives of the Mellon Institute of Industrial Research at the University of Pittsburgh for help in coordinating a response to the silicosis crisis (18). Organized in 1913 with funds from steel magnates and bankers Andrew W. Mel-

public health and legal experts (25). William P. Yant, a member of the Konicide Club, presided over the session, characterizing it as "a meeting of representatives of trade organizations" (26).

According to Vandiver Brown of the Johns-Manville Company, who attended this first gathering, the sense of the meeting was that there were four areas of common interest. First among these was the "menace of ambulance chasing lawyers in combination with unscrupulous doctors." Brown observed that the group was worried that under the jury system of liability, the "uncertainties surrounding diagnosis" of the pneumoconioses allowed plaintiffs to sway lay juries against the manufacturer. The second area of common concern flowed out of the first: "the desirability of making various dust diseases compensable under properly drawn workmen's compensation laws." Brown reported that the representatives at the meeting believed that workers' compensation would "eliminate the jury and empower a Medical Board to pass upon the existence of the disease and the extent of the disability." In addition, Brown noted in a two-line paragraph that the "problems of ventilation, dust collecting and elimination, and respiratory devices" were a common theme. Finally, the need for "establishing of standards" for dust counting, the "taking of x-rays for diagnostic use," and the technical problems of film interpretation concerned the group (27).

The executives elected a Temporary Organization Committee to establish a permanent organization to plan a coordinated industry-wide program in research and evaluation into dust and its impact on workers' health (28). Shortly following this initial meeting, the Temporary Organization Committee met together at the Duquesne Club in Pittsburgh on February 1, 1935 to discuss the development of a common agenda to meet the needs of the various dust-producing industries. The group discussed a working paper prepared by Weidlein that argued that industry had to both protect its financial interests from the dangers of unsubstantiated lawsuits and other claims as well as to coordinate research. "It is necessary that there be some organization representing industries for the reason that no program of research investigation could be carried on without assurance of continuity and financial support" (29). The organization "must have a broad outlook, a sympathetic understanding of the problem, and wide contacts with all cooperating agencies; and it must have the confidence of the industries, and of the physicians, engineers and all institu-

Temporary Organizing Committee, because he believed that "there is now no one place where there is available *all* information on *all* phases of the problem; and no *concerted* planning is being done either as to the present or future or as to *all* of many different phases" (33). Recognizing that many of the industries that he sought to attract to the group were wary of publicity about dust, Hitchens promoted the idea that such an "Industrial Dust Institute" would keep membership and contributions "entirely confidential" (34). On December 2, 1935 the Foundation was incorporated in Ohio (35).

Of immediate concern to its members was the looming congressional hearing regarding Gauley Bridge. "Because of recent misleading publicity about silicosis and the appointment of a congressional committee to hold public hearings, the attention of much of the entire country has been focused on silicosis." Their concern was that it was "more than probable that this publicity will result in a flood of claims, whether justified or unjustified, and will tend toward improperly considered proposals for legislation." As a result, the Foundation almost immediately decided to de-emphasize its "fact finding and evaluation of data" in favor of a program to "improve to practical limits the dust conditions in the industries." Together with this program went a publicity campaign to place before the public their own perspective on the silicosis problem. "[T]hrough articles and items contributed to technical and popular magazines, trade journals and newspapers, and through talks to interested groups at conventions and elsewhere, and also by radio," the Foundation hoped to shape public opinion about silicosis (36). At the same moment that they told their members that they would slow down their fact finding and evaluation efforts, the Foundation "added to the staff of the managing director a well-qualified public and industrial relations man [John F. McMahon]" (37). The Foundation presented a public face of neutrality and objectivity. But its private goal was to return the discussion of silicosis to the realm of science and medicine where experts drawn largely from the original members of the Konicide Club could assert their dominance over lawyers, politicians and labor unions (38).

THE NATIONAL SILICOSIS CONFERENCES

A little over a year after the first organizing conference of the Air Hygiene Foundation, and in the face of growing concern about silicosis, the United States Department of Labor's Division of Labor Standards

decades (42). Vandiver Brown, the General Attorney for the Johns-Manville Asbestos Corporation, had initially been suspicious of joining an organization that appeared little more than an interest group defending the narrow needs of silica industries. After the first meeting of the Foundation in January, 1935, Brown suggested that asbestos companies "did not care to be associated in the minds of the public or of employees with those industries whose problem was silicosis" (43). Two years later, however, after Brown had attended the Special Meeting of the Air Hygiene Foundation on November 24, 1936, he changed his views, recommending that Johns-Manville and "all members of the asbestos industry" support the Foundation. By this time he was convinced that the Foundation had avoided the pitfall of becoming known solely as an interest group of the silica industries and had gained a reputation for approaching the dust issue "from an unbiased viewpoint." He also believed that underlying the Foundation was a reliance on and sympathy for industry. "It [the Air Hygiene Foundation] is, nevertheless, the creature of industry and is the one institution upon which employers can rely completely for a sympathetic appreciation of their viewpoint. Its aim is to make an honest effort to appraise the evil, to advance scientific knowledge of many of its doubtful aspects and to suggest remedies, both preventative and curative. As such it deserves and should receive the unqualified support of all members of industries faced with the dust disease hazard" (44).

Within two years of its establishment, the Foundation published two of the most influential reports on the medical and preventive engineering aspects of silicosis. In April, 1937, the Air Hygiene Foundation's Medical Committee, chaired by A. J. Lanza, published a 178-page history and analysis of "Silicosis and Allied Disorders" as Bulletin No. 1 of its Medical Series. The Foundation's committee was chaired by Anthony Lanza and had as its members Leroy U. Gardner of the Saranac Laboratory, T. Lyle Hazlett of Westinghouse Electric and Manufacturing Company, R. R. Jones, then of Bell Telephone Company, Dr. O. A. Sander, an industry consultant, and R. R. Sayers of the United States Public Health Service among others, most of whom had been members of the Konicide Club as well. It provided a history of silicosis in the United States and foreign countries, reviewed the definition, pathology, and diagnosis of silicosis, examined the roentgenological appearances of the disease, as well as its pathol-

dustry and the solutions were constrained by the economic decisions of individual firms. Workers were to be protected through engineering methods that did not disrupt existing technologies or the continued use of sand in blasting. A consensus developed that technologically feasible engineering and medical standards could be developed to prevent silicosis from shortening a person's work life. The impact of silicosis was to be measured by its effect on workers' ability to earn a living, not upon their sense of well-being or the quality of their lives after retirement. Although the Conference addressed questions about the definition and prevalence of the condition, the Conference reports were primarily concerned with the implications of clinical, legal and engineering decisions on industry liability through the compensation system. Industry and its allied experts hoped that the workers' compensation system could contain the silicosis crisis.

The Reports reflected the business and public health perspectives in general and the influence of the Air Hygiene Foundation in particular. First, the reports of the various committees sought to reassure the public concerning the overall danger from silica on the job. Silicosis, it was argued, was not as serious a problem as had been feared and, the reports argued, the vast majority of workers were not at risk. Rather, it was a threat in only a few select and scattered industries. Second, the conference participants sought to reassure both the public and industry that the problem could be addressed through existing regulatory and insurance mechanisms and did not require national legislation to control silicosis or a drastic reorganization of the system of compensation. Rather, the conferees argued, silicosis should be integrated in the compensation system and medical boards should replace lay juries as the arbiters of compensable disease. Third, the conferees agreed that there were relatively straightforward technical solutions such as wet drilling, ventilation and respirators. It was agreed that these techniques could be applied to the few seriously affected industries and that their adoption could eliminate the silicosis hazard. The report emphasized that the reduction in levels of exposure, not the total elimination of contact, could control the problem. No fundamental alteration of industrial production would be required by the mining, foundry, stone cutting and other industries. In light of the severe economic disruptions brought on by the Depression, the conferees sought to allay fear and emphasize that work

the broad public arena in which liability suits were fought. Alfred Hirth and others in the Foundation had supported the inclusion of silicosis in state and federal workers compensation legislation. The Foundation had provided information to its members but had avoided publicly endorsing any specific legislative plan. Yet, privately, the AHF was quite active in trying to shape state legislation around silicosis. In a detailed letter to the Board of Trustees, Alfred Hirth, the Chair of the AHF's Legal Committee, proposed that the Foundation prepare a piece of workers compensation legislation that could serve as a model for individual states. Hirth, however, believed that the AHF was "not the best organization to publicly sponsor the contemplated move" because it was "on last analysis, an employer organization." As such, "any legislative proposal it may make is subject to the same scrutiny and criticism as is given proposals of organizations such as the National Manufacturers Association, United States Chamber of Commerce, etc." He reported that the Legal Committee agreed that some other organization, free from the burden of appearing to represent industry, be approached to sponsor such legislation. The committee suggested the "Committee on Legislation of the American Bar Association, who, because of their non-partisan character are ideally suited to appear publicly as the sponsor of this work." He noted that the Foundation was "rather fortunate in the fact that the present President of the American Bar Association has been associated with both Mr. [Theodore] Waters [also a member of the AHF Legal Committee] and the writer in silicosis matters. He will therefore appreciate the importance of this work and we believe that we can rely upon him to give us his active personal assistance" (55).

Despite its growing popularity among industry groups, the Foundation wanted to shed its image as just another trade association. Its leaders sought a broader legitimacy, in the image of the National Civic Federation, the Progressive era group that joined business, labor and social reformers around a corporate liberal agenda. Yet, unlike the Federation, the Air Hygiene Foundation sought only to integrate business, professional and governmental interests rather than those of labor or social critics. Like the NCF, however, the Foundation also saw its responsibilities in the broadest possible terms. It was not short-term profit that defined its mission. Rather, it saw long-term business success as closely linked to public attitudes toward business itself. It sought to combine the success of the trade associa-

tions that flourished in the 1920s with the ideology of corporate liberalism. From the vantage point of its organizers, the silicosis crisis was symptomatic of a broader crisis for American capitalism, and business needed to address both if it was to survive and eventually prosper. As John F. McMahon, the publicist for the Air Hygiene Foundation, believed, "the employer's no. 1 job today is not to sell his products but to sell the system that makes those products possible." The Foundation saw itself as "a collective effort by employers in behalf of employee health" and therefore as a "clear cut illustration of [the] 'assumption of greater social responsibility,' as advocated by progressive leaders of business." Such activities could serve as "antitoxin for the agitation against private enterprise" (56). McMahon reiterated the broad social analysis that legitimated the Air Hygiene Foundation: "Viewed broadly, the support of [the] Air Hygiene Foundation by industry is an investment in the American system of business and in the preservation of that system" (57). The Foundation was a voluntaristic industry-sponsored alternative to the threat of federal action. "Either employers will deal intelligently with industrial health, through collective cooperation—and the Foundation is the only existing agency where they can do that—or they can continue their present disorganized course and await government inspection and enforcement of factory health standards" (58). Through unified action, the dusty trades had an opportunity to protect their own interests as well as to give structure to the silicosis debate.

But together with this broad outlook, the original concern with the liability crisis did not fade. As late as 1940–41, just as the Air Hygiene Foundation began to enlarge its focus and adopt a new name (59), appeals to its constituent members still emphasized protecting its members from liability suits. In its annual "Report of [the] Membership Committee," C. E. Ralston, safety director of the Pittsburgh Plate Glass Company, outlined his rationale for joining the Foundation. The Foundation's service of conducting plant surveys was presented as a major benefit to member companies. "In case of claims, you have a record showing what the health conditions actually were at the time of alleged injury. . . . The report you receive from the Foundation removes the 'guess work' and speculation as to whether there was or wasn't a hazard at the time in question. Further, as Mr. Fletcher pointed out here a year ago, a survey report from an outside,

independent agency carries more weight in Court or before a compensation commission than does a report prepared by your own people. In other words, an outside party can talk with greater weight about you than you can talk about yourself" (60).

In addition to appealing to the technical aspects of dust measurement and control that would prove useful in protecting its members in liability suits, Air Hygiene Foundation members were also instrumental in pressing for the inclusion of silicosis in workmen's compensation legislation. This, they understood, would remove silicosis from the liability system and provide greater protection to the industries and insurance companies that constituted their corporate membership. Before the 1930s, industry had almost uniformly opposed the inclusion of disease into workers' compensation systems, but, in light of the silicosis crisis, industry positions changed (61).

During World War II, the focus of the Air Hygiene Foundation shifted dramatically from a concern about silicosis to an involvement in a wider range of industrial disease activities. The most obvious manifestation of this shifting focus was the change in name to the Industrial Hygiene Foundation. This was justified on a number of grounds. First, the Foundation's leadership believed that the silicosis crisis had passed and that the Foundation could not grow unless it moved on to new areas. Second, the demands of the war, and especially the need for increased production while conserving domestic manpower, led to a new emphasis on more acute conditions. As Roger A. Hitchins, Chairman of the Foundation, explained at the Fifth Annual Meeting in 1940, the Air Hygiene Foundation's membership were now "devoted to the defense program" and the old focus on silicosis was no longer appropriate. "A handicap suffered by the Foundation in its earlier years, but which could not be avoided at the time, was the quite generally held opinion that it was in effect a 'silicosis institute.' . . . It is believed that this erroneous idea has been changed and that it is fairly well understood that the Foundation's work extends over the entire field of employee health" (62).

THE POSTWAR CONSENSUS

The business community, and especially the Industrial Hygiene Foundation, were active in shaping a postwar consensus among professionals in industrial hygiene and medicine that silicosis was a disease

berculosis and industrial dust. When the silicosis crisis hit in the early 1930s, it sought to expand its involvement in this potentially rich arena. In 1932, for example, Saranac's Director began an aggressive campaign to gain the support of the insurance industry and various mining companies. In one such letter soliciting support, they held out the prospect of information that might translate into "direct financial value to the insurance companies writing industrial compensation policies" (67).

By the late 1940s, they had succeeded in establishing important contracts with a variety of mining interests and had come to depend upon these contracts for their support. The relationship became so close that even when their scientific experts, such as Leroy U. Gardner, sought to assert ostensible neutrality in labor-management disputes, few accepted his claims. The attorneys for one mining company scoffed at Gardner's reluctance to testify in a silicosis suit: "We did not agree with him that his refusal to testify would help maintain Saranac as an independent research organization because . . . all of the mining companies were associated with Saranac and certainly, in the eyes of everyone, excepting Dr. Gardner, Saranac was a 'mining company institution'" (68).

While it is difficult to say with certainty that Saranac's work had been unduly influenced by its evolving relationship to the business community, there is evidence to suggest that some of its clinical findings were used selectively. One Finnish-born immigrant whose records were reviewed by Trudeau and Saranac worked as a miner from 1908 until his death in 1947 at the age of 61. His work history and x-rays going back to 1933 confirmed silicosis advancing from first degree in 1933 to third degree by 1936. But the immediate cause of death was a cerebral hemorrhage, allowing the company to escape having to pay compensation. The head of the Trudeau field office at Ironwood, Michigan wrote to the research director, "It looks as if they may win this one as death was apparently caused by cerebral hemorrhage; if successful, a good sum of money will be saved" (69).

THE DEATH OF THE SILICOSIS ISSUE

The Industrial Hygiene Foundation played a crucial role in the post-war years in the demise of silicosis as a serious public health problem. The IHF's influence on the field of industrial hygiene was extended at this time when Theodore Hatch assumed the Presidency of the Amer-

Only growing attention to asbestos-related disease and coal workers pneumoconiosis seems to have reversed this declining interest.

Similarly, the average number of articles on silicosis specifically declined from a Depression-era high of 35 per year between 1937 and 1940 to a mere 9 per year between 1953-1956. Furthermore, the small number of articles on silicosis in the journals of the 1950s were in specialty journals, rather than regional and local medical journals commonly read by local practitioners. In 1933-36, for example, over 11 percent of articles on silicosis were in local journals. By 1961-64, less than 1 percent were in these local organs. One might conclude that local practitioners who make up the bulk of the readership of local medical society journals were no longer exposed to reports about silicosis in their regions and that the condition became the preserve of a specialty group. This movement away from the generalists and toward specialization is reflected in the subject matter of the articles as well. During the 1930s, the articles were descriptive and therefore accessible to the generalists. By the 1950s, the articles were more technical, appealing to specialists in the emerging fields of pulmonary and thoracic medicine. The Chief of the Health and Safety Division of the U.S. Bureau of Mines summarized the recent amnesia regarding silicosis and lamented the "apparently concerted effort to hide the facts regarding dust diseases in industry" (74). Throughout the 1950s and 1960s, sporadic reports of clusters of silicosis cases continued to be reported.

CONCLUSION

During the early 1930s, silicosis was perceived to be a widespread and potentially epidemic health problem among workers in a host of industrial operations. Sandblasters, miners, quarrymen, steel and foundry workers among others were perceived to be at risk of contracting this debilitating lung condition. Yet, less than a decade later, it was said to be a disease of the past. Significantly, technical experts played an important role in this remarkably rapid turnaround: a disease whose symptoms often took decades to appear rapidly vanished from public view. In part, the growing inattention to this condition may be the result of dramatic improvements in ventilation. But, in part, it appears that a central role was played by industries themselves through ostensibly neutral scientific studies. Through the Air Hygiene Foundation, common programs were developed to address the polit-

3. Donald E. Cummings to Anthony J. Lanza, January 24, 1933, Plaintiff's Exhibit No. 5197, Wilentz.
 4. Donald E. Cummings to Anthony J. Lanza, January 24, 1933, Plaintiff's Exhibit No. 5197, Wilentz.
 5. M. D. Harbaugh, "Labor Relations in the Tri-State Mining District," *The Mining Congress Journal*, June, 1936, 20-21. In our book *Deadly Dust*, we noted that "although the government, industry, and insurance companies continued to study the area until 1933, none of the later data were published." However, it is now possible to suggest that the reason there was no further publication of data from the clinic was that the mine companies successfully suppressed them. David Rosner and Gerald Markowitz. *Deadly Dust: Silicosis and the Politics of Occupational Disease in Twentieth Century America*. (Princeton: Princeton University Press, 1991), p. 145.
 6. A review of the articles listed in *Index Medicus* between 1933 and 1942 reveals that Cummings did not publish an article on silicosis in the Tri-State area. The following article does not address the Tri-State region: D. E. Cummings. "Etiology of Silicosis," *Saranac Laboratory Symposium on Silicosis*, 1939, pp. 20-34; another piece relates specifically to tuberculosis: D. E. Cummings, R. N. Downs, M. Berg. "Tuberculosis Lesions in Male Industrial Workers; Their Incidence and Significance as Disclosed by Stereoscopic Chest Reontgenogram," *American Review of Tuberculosis*, 39 (April, 1939), 439-455.
 7. See David Rosner and Gerald Markowitz, *Deadly Dust, Silicosis and the Politics of Occupational Disease in Twentieth Century America*, (Princeton University Press, 1991) for a more complete discussion of the social and epidemiological crisis of the 1930s.
 8. Andrew J. Farrell, "Silicosis in Certain of Its Legal Aspects," *Industrial Medicine*, 1(Oct. 1932), 35.
 9. Quoted in David Rosner and Gerald Markowitz, *Deadly Dust: Silicosis and the Politics of Occupational Disease in Twentieth Century America* (Princeton: Princeton University Press, 1991), p. 75.
 10. For a broad discussion of the silicosis crisis of the 1930s, see: David Rosner and Gerald Markowitz, *Deadly Dust: Silicosis and the Politics of Occupational Disease in Twentieth Century America* (Princeton: Princeton University Press, 1991).
 11. Theodore F. Hatch and Eugene P. Pendergrass, "The Konicide Club (1932-1940) A Brief History," *Journal of Occupational Medicine*, 19 May, 1977), 351.
 12. Theodore F. Hatch and Eugene P. Pendergrass, "The Konicide Club (1932-1940) A Brief History," *Journal of Occupational Medicine*, 19 May, 1977), 351-52. Drinker developed a list of individuals who might
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- Konicide Club (1932-1940) A Brief History," *Journal of Occupational Medicine*, 19 (May, 1977), 352-53.
18. H. B. Meller to Dr. E. R. Weidlein, October 9, 1934. [Courtesy of Joel Tarr].
 19. William Graebner, "Hegemony Through Science: Information Engineering and Lead Toxicology, 1925-1965," Rosner and Markowitz, eds. *Dying for Work* 145.
 20. Vandiver Brown, "Memorandum Re:-Mellon Institute of Industrial Research Symposium on Dust Problems-Pittsburgh-January 15, 1935," January 18, 1935, Wilentz.
 21. H. B. Meller to E. R. Weidlein, October 9, 1934, courtesy of Joel Tarr.
 22. Just before the first meeting of the Temporary Organizing Committee in 1935, Philip Drinker wrote to the Konicide Club members calling them together for what he considered to be "an unusually important meeting [that would] be entirely informal and private." He noted that R. R. Sayers had organized a program that "has a direct bearing on the forthcoming conference at the Mellon Institute." See Philip Drinker, "Konicide Club Meeting," Dec. 28, 1934, NARG 70 (U.S. Bureau of Mines) Box 2429, 1936.
 23. "Report and Recommendation of the Temporary Organization Committee which was Elected at the 'Symposium on Dust Problems' Held at Pittsburgh, Pa., January 15, 1935," Feb. 6, 1935, and Roger A. Hitchens, "A Brief Outline of the Events Leading up to and Occurring at the 'Symposium of Dust Problems' Held in Pittsburgh, Pa. Jan. 15, 1935," both enclosed in W. G. Hazard to Dr. L. R. Thompson, Mar. 21, 1935, NARG 90, U.S.P.H.S., 0875-96-49, Pittsburgh, PA.
 24. See, for a complete discussion of this tragedy, Martin Cherniack, *The Hawk's Nest Incident* (New Haven: Yale University Press, 1988).
 25. Roger A. Hitchens, "A Brief Outline of the Events Leading up to and Occurring at the 'Symposium on Dust Problems' Held in Pittsburgh, Pa. January 15, 1935," in W. G. Hazard to Dr. L. R. Thompson, March 21, 1935, National Archives, Record Group 90, "State Boards of Health," (0875-96-49, Pittsburgh, PA); participants included: Mr. A. C. Hirth, a corporate lawyer from Toledo, Ohio; Dr. R. R. Sayers of the U.S. Public Health Service; Dr. A. J. Lanza of the Metropolitan Life Insurance Company; Dr. Eugene P. Pendergrass of the University of Pennsylvania; Professor Philip Drinker of Harvard; F. Robertson Jones of the Association of Casualty Insurance Executives; Donald E. Cummings of the Saranac Laboratory; and Dr. Samuel R. Haythorn of the Singer Memorial Laboratory in Pittsburgh.
 26. William P. Yant to Mr. Fieldner, January 5, 1935, NARG 70, Box 2201, File: 437.4 (1935).
 27. Vandiver Brown, "Memorandum Re:-Mellon Institute of Industrial Re-
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39. Zimmer to Secretary Perkins, February 19, 1936, National Archives, Record Group 100, 7-0-4(1). The National Safety Council, the Casualty Insurers Underwriters, the American Foundrymen's Association, Union Carbide and Sand and Gravel trade associations were among the groups that had to be won over.
 40. "National Silicosis Conference," *American Labor Legislation Review* 26 (1936): 60.
 41. H. B. Meller, "Silicosis: Program of United States Department of Labor, and Interest and Cooperation of Air Hygiene Foundation," 1936, Carnegie-Mellon Archives. We are indebted to Joel Tarr for providing us with this document.
 42. *History of Industrial Hygiene Foundation* (Pittsburgh, PA: Mellon Institute, 1956), 2-3; Air Hygiene Foundation of America, *Proceedings of Annual Meeting and Research Program* (Pittsburgh PA: April 1, 1937), 12-14. For examples of the aggressive public relations campaign that the Foundation waged both within industry as well as in the popular press, see, Air Hygiene Foundation, "Progress Reports," Mellon Institute of Industrial Research, Carnegie Mellon University Archives, Papers of the Mellon Institute.
 43. Vandiver Brown, "Memorandum Re: Mellon Institute of Industrial Research Symposium on Dust Problems-Pittsburgh-Jan. 15, 1935," January 18, 1935, Wilentz.
 44. Vandiver Brown to C. J. Stover, Dec. 4, 1936, [copy], Wilentz.
 45. Air Hygiene Foundation of America, Inc., Medical Series, Bulletin No. 1, "Silicosis and Allied Disorders, History and Industrial Importance," Pittsburgh, PA, April 15, 1937, p. 169. For an earlier statement of these same points see: Air Hygiene Foundation of America, Inc., "Special Meeting of Members," Pittsburgh, PA, Nov. 24, 1936.
 46. Air Hygiene Foundation of America, Inc., Medical Series, Bulletin No. 1, "Silicosis and Allied Disorders, History and Industrial Importance," Pittsburgh, PA, April 15, 1937, p. 169. For an earlier statement of these same points see: Air Hygiene Foundation of America, Inc., "Special Meeting of Members," Pittsburgh, PA, Nov. 24, 1936.
 47. As early as 1930 interest grew in establishing a standard for silica. The American Public Health Association's Committee on Silicosis (composed of R. R. Sayers, A. J. Lanza and Emery R. Hayhurst) pointed out that traditional industrial standards of between 5 and 10 mppcf were not found to prevent the occurrence of silicosis. Rather, in the early 1930s, they pointed out that standards were developed in part because they "could be reached by the use of economically practicable ventilating devices." See: "Effect of Dust on the Lungs," *American Journal of Public Health*, 20 (April, 1930), 372.
 48. As early as 1930 interest grew in establishing a standard for silica. The American Public Health Association's Committee on Silicosis (composed of R. R. Sayers, A. J. Lanza and Emery R. Hayhurst) pointed out that tradi-
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could go on as usual. On this issue, management and labor had essentially the same goal: to reduce the hazard without undercutting the industries that created scarce jobs.

Another major impact that the Air Hygiene Foundation had on the silicosis issue in the 1930s and beyond was in its recommendations regarding the control and measurement of dust in factories, mines and mills. The foundation endorsed the use of protective equipment as a means of protecting the workforce from disease. "The use of such equipment should be the second step and not the first in the dust control project. But protective equipment will always have a place in industry" (50).

The Engineering Committee of the National Silicosis Conference endorsed the idea that dust control methods had to be formulated with the costs to industry of any technological improvements in mind. "To be put into practice these methods must be economically feasible so that industries both large and small may utilize them in the solution of their dust problem." The engineering group noted that safer substances were generally unavailable to most industries or, if available, were too costly and, therefore, "the solution of the problem depends upon reduction of the concentration of the dust to safe limits." The engineering group began with the assumption that workers would always be exposed to some silica dust (51).

By the time of its annual meeting on April 1, 1937, the Air Hygiene Foundation had further established its credibility among industrial leaders. Its membership had grown during this time eight fold, from 20 to 168 members. Many companies and trade associations with a "silicosis problem" had signed on including Union Carbide, Harbison-Walker Refractories, the American Mining Congress, the American Zinc Institute, the Barre Granite Association, the Foundry Supply Manufacturers' Association, the National Industrial Sand Association, the Tri-State Zinc and Lead Ore Producers Association, the United States Potters Association and the Lead Industries Association among many others (52). They had established research links with Harvard, the Saranac Laboratory, the University of Pennsylvania as well as the Mellon Institute itself (53). By the end of November, 1937, the organization had 192 members (54).

Addressing the biomedical and engineering issues was one part of the Foundation's attempt to deal with the broad liability crisis. Another aspect was to find ways to remove silicosis from the courts and

ogy. By and large, this work did not break any new ground but summarized a diverse and immense literature, framing the issue in medical engineering and largely technical language (45).

One area where it had an impact in shaping the future of the silicosis debate was in its promulgation of the idea of "permissible thresholds of dustiness" to which workers could be exposed. In response to the industry's needs for a benchmark that could be used as a defense in liability suits, levels of permissible dustiness became a medicolegal issue of great importance. As Weidlein had originally proposed two years earlier, if the technical community would set 'safe' limits that industry could meet, companies would be able to protect themselves from liability suits for negligence. In an analysis aimed at their own membership, the Air Hygiene Foundation raised serious questions about the validity of the standard that they themselves were proposing as a mechanism for protecting workers' lungs from disease. They acknowledged that they did not have "the knowledge upon which to base such thresholds [of dustiness]." What they did have were "bench marks . . . to indicate to the engineer the result to which he should strive." "Concentrations to which the dust must be reduced in order to be safe have not been absolutely determined," they noted (46). Nevertheless, Lanza's committee suggested a standard of 5 million particles per cubic foot of air for granite and other high-silica containing dusts (47). "It is desirable to avoid concentrations of more than 5,000,000 particles of dust containing a high percentage of free silica in working places" (48). This 'standard' would have a major impact on all subsequent discussion of what would come to be called threshold limits and maximum allowable concentrations (49).

As the Air Hygiene Foundation was establishing itself as the premier organization in the evaluation of the dangers in the dusty trades, the Department of Labor held its Second National Silicosis Conference to hear the final reports of the various committees. This represented the real work of the Conference. These committees were dominated by Air Hygiene Foundation members and other experts who developed a consensus that would define the silicosis issue in the coming years and even decades. The agenda being developed was ostensibly a product of objective scientific and technical discussions. But the discussions were framed by the very real social crisis facing in-

organized a National Silicosis Conference to try to air and to reconcile the divergent points of view about the social, scientific, economic and political implications of the silicosis crisis. The Air Hygiene Foundation, along with other industry groups, approached the Labor Department's National Conference on Silicosis warily and pressed the Department of Labor "to break down the reluctance on the part of employers . . . [and] to allay suspicion of an ulterior motive" (39). The conference convened in Washington on April 14, 1936. Of the people present, half "were . . . representatives of employers in the dusty trades," one quarter were public officials, ten percent represented insurance companies, and five percent represented labor (40).

Despite the apparent diversity of the program participants, the Air Hygiene Foundation tied together many of the key participants. Of the three major papers read at the Conference, two were by Foundation members. A. C. Hirth was the Chair of the Legal Committee of the Foundation and presented a paper on the viewpoint of management to the Conference. Dr. R. R. Sayers of the United States Public Health Service was also a member of the Foundation's "Medical Committee." He delivered the address on the "engineering and medical aspects" of the silicosis hazard. In addition, the Foundation was heavily represented in the four working committees that were set up to carry out the work of the Conference: "Five trustees, three committee chairmen and six members of committees of Air Hygiene Foundation are members of one or other of Mr. Zimmer's committees; three of them are chairmen . . . It is plain," the AHF reported to its members, "that the Foundation is being extended an opportunity to collaborate fully, to aid especially in giving the views and attitude of the industries" (41).

By 1936, the Air Hygiene Foundation had established legitimacy in the fields of medicine, law and engineering by attracting to its various working committees nearly all of the top names in the silicosis research and engineering communities. They established research links with Harvard, the Saranac Laboratory, the University of Pennsylvania as well as the Mellon Institute itself. In the midst of the Depression, with limited funds available and the federal government incapable of embarking on a major research effort, the Air Hygiene Foundation and the public health researchers associated with it emerged as major forces shaping occupational lung research and the technical debate about silicosis in the United States for the next two

tions, groups or individuals who might cooperate to advantage" (30). There was no discussion of including workers or organized labor.

Industry could achieve major benefits by providing the funding for such an organization, according to Weidlein. The new organization could determine which specialists "may not be properly qualified and whose results might, therefore, not be entirely acceptable . . . ; to be in position to make reasonable grants to qualified individuals and agencies to study special problems or phases of problems." Weidlein suggested that industry could retain some control over the dissemination of information, if it were to support a permanent research organization. On a more practical level, such research could be "important from both medical and legal standpoints in the preparation of court cases" as well as assist "in the preparation of safety codes and fair laws" (31).

Weidlein outlined a five point program by which industry could band together to both control their own members' behavior as well as to set the agenda for silicosis in the nation as a whole. In the medical phase of the effort, Weidlein proposed to collect all existing information on dust diseases, to focus attention on areas that demanded more research, and finally to secure the cooperation of the American Medical Association "in setting up authoritative and approved standards of diagnosis and correction." In what he called the "preventive" area, he maintained that the organization assume the role of establishing "authoritative and approved standards." By voluntarily establishing standards and pressuring industry to live up to them, companies would be able to erect a "defense against personal injury suits." In the legal arena, the organization could serve as a legal clearing house and advise businesses faced by liability suits, while in the legislative arena the organization could help "secure the enactment of state laws, of a uniform character, which, when complied with, will fairly and properly protect the interest of industry and those engaged in industry and of enlisting the cooperation of the federal government in that direction." Finally, the new organization would publicize what measures "are being and should be taken in the direction of protecting both human life and property." The sum of all this activity would be that industries most affected by the silicosis debate could collectively shape a research agenda, legal framework, and legislative program (32).

Weidlein's plan appealed to Roger A. Hitchens, Chairman of the

lon and Richard B. Mellon, the Institute "sponsored field and laboratory research on its premises and also functioned as an umbrella for organizations directly involved in the politics of industrial and environmental health" (19). Even though its work was funded by industry, the Institute had a good deal of credibility with the general public because of its early attention to air pollution in Pittsburgh.

The immediate initiative for the development of a dust program came from "representatives of the sand and glass and refractories industries." F. W. Sherwood, Vice-President of Owens-Illinois Glass Company, and Roger Hitchens, President of the American Refractories Institute, met with Dr. E. R. Weidlein, Director of the Mellon Institute, about "the need of some form of concerted action on the part of those industries presently or potentially involved" with the silicosis crisis (20). While industry understood the need for concerted action, the Mellon Institute saw its role as a coordinator of research and scholarship. "... [A] great deal of investigational work is being carried on by an increasing number of scientists, most of it by medical men working more or less independently," H. B. Meller of the Mellon Institute wrote to Weidlein. He suggested that a more organized research effort was preferable and that "it should be financed by the industries that stand to be affected" (21).

The goals of the Mellon Institute meshed perfectly with those of the Konicide Club (22). Shortly after this initial meeting, Weidlein wrote "at the request of a few of the industries, in which the dust hazard exists, in an effort to determine whether sufficient interest existed to warrant having a meeting for a general discussion of this question." He wrote "to more than eighty industries" and "the response . . . was immediate and represented a large percentage of the industries to whom the original letter had been sent" (23).

The political environment within which the Air Hygiene Foundation was organizing changed dramatically following widespread publicity regarding exposure of Union Carbide's attempt to cover up the deaths from silicosis of hundreds of tunnel workers in Gauley Bridge, West Virginia (24). On January 15, 1935, a day before the Congressional hearings on Gauley Bridge began, over two hundred industries executives met at the University Club in Pittsburgh for a meeting called a "Symposium on Dust Problems." "No reporters were present at this meeting and no stenographic notes were kept." Attendance was by registration only and the group was addressed by industrial,

have been exposed to potentially dangerous levels of dust and, therefore, to the disabling and often deadly disease (7). Thousands of workers in the dusty trades, laid off during the Depression, brought lawsuits against employers, seeking damages for exposure to silica. This led to a broad liability crisis threatening the "closing of industrial plants and a vast economic loss" (8). As Anthony J. Lanza, who in the 1930s became head of Metropolitan Life's Division of Occupational Health, said, it was as if "out of a clear sky and with dramatic suddenness the insurance companies were faced with a situation that was . . . terrifying" (9). By the early 1930s, while numerous investigations were underway, there was little coordination of this research. There was also a great deal of confusion about the extent of the problem, the mechanism by which silica affected the lung, and the means by which to control the dust hazard (10).

THE KONICIDE CLUB

It was in the context of financial crisis and scientific uncertainty that a small group gathered at the Pittsburgh laboratories of the U.S. Bureau of Mines in January 1932 to exchange information, create a research agenda, and coordinate research into silicosis. According to the recollections of two of the original participants, "Particular interest [at the first meeting] centered around [methods for the] standardization of atmospheric dust sampling and assessment of dust exposure and the parallel procedures for evaluating the respiratory injury found in exposed individuals" (11). At the conclusion of this preliminary meeting, one of the conveners, Philip Drinker, Professor at the Harvard School of Public Health, suggested that the group call itself the "Konicide Club," which loosely translated meant "killer dust club."

The club was important in that it was the first mechanism by which industry, insurance, and technical experts could begin to shape the silicosis debate. In the coming years the members of the club emerged as the dominant experts on silicosis and the core of the technical committees of the Air Hygiene Foundation, the forerunner of the Industrial Health Foundation. The club functioned as an informal and loosely organized mechanism for the exchange of information among a small group of colleagues interested in silicosis. While Drinker assumed the duties of Secretary of the organization, there were no other formal officers. Each meeting elected someone to chair the session in an attempt to maintain an atmosphere of informality and collegiality (12).

politan Life, complaining that he had not realized "when we entered upon this investigation the fact that it must be approved by the industry as well as by the Metropolitan Life Insurance Company and the U.S. Bureau of Mines." He told Lanza that he could "appreciate [the companies'] reluctance to have any such data . . . [used] against the mine companies," but that suppression presented him with a personal dilemma. He had been collecting these data, always intending to publish them in the *American Review of Tuberculosis*. What harm could there be, he wondered, in presenting his findings in a journal with "a small circulation" of experts? It "would not reach the hands of any except those interested in the more or less technical aspects of this disease," he promised Lanza (3).

Cummings was clearly disturbed by the attempt of industry to interfere in the publication of his results. But he was even more concerned that he had already exposed himself to possible legal action by the companies. He might find himself "investigating silicosis in the rock piles of the federal penitentiary in Atlanta in the course of the next few months," he sarcastically noted, because he had already "submitted part of this evidence" at a conference in Chicago and feared that his data were already "incorporated in the report of that conference." He told Lanza that he would "write today in an attempt to delete this information from the record" if it were not "already too late" (4). We do not know Lanza's reply to Cummings' appeal (5). But we do know that whatever action was taken was inadequate to result in publication of the findings (6).

This essay focuses on the early history of industry and professional relationships around silicosis, the disease that was the focus of the lead and zinc owners and Cummings' interest in the 1930s. Specifically, we will look into the development of the Air Hygiene Foundation (later, the Industrial Health Foundation), an organization that would incorporate into membership both researchers such as Donald Cummings, and industries and trade associations including the Tri-State Zinc and Lead Ore Producers Association, the group represented by Harbaugh, and Metropolitan Life, the employer of Anthony Lanza. We will explore some of the issues that arose when this industry-sponsored group promoted public policy and scientific investigations. We will ask: Under what conditions is it appropriate for professionals and scientists to work in concert with industrially-sponsored organizations? What are the pressures that shape research questions, the

76. See, for examples of the literature on the 1970s–1980s silicosis epidemics: Behzad Samimi, Hans Weill, Morton Ziskind, “Respirable Silica Dust Exposure of Sandblasters and Associated Workers in Steel Fabrication Yards,” *Archives of Environmental Health*, 29 (August, 1974), pp. 61–65; Austin Blair, “Abrasive Blasting Respiratory Protective Practices,” U.S. Department of Health, Education and Welfare, NIOSH, Cincinnati, Ohio, April, 1974; Phillip J. Landrigan, “Testimony before OSHA Concerning a Proposed Rule on Air Contaminants,” Aug. 1, 1988, U.S. Department of Labor Docket Office, H–006; David J. Valiante and Kenneth D. Rosenman, “Does Silicosis Still Occur?,” *Journal of the American Medical Association*, 262 (Dec. 1, 1989) 3003–3007; Records of the Silica Safety Association, 1975–1982.

ABSTRACT

This essay focuses on the early history of industry and professional relationships around silicosis, the debilitating occupational lung disease, through a study of the role of the Industrial Health Foundation, an industry-sponsored group which has played a critical role in shaping the nation's agenda regarding industrial disease. From its start during the Depression, it has portrayed itself as an industry-sponsored agency that depended upon detached, disinterested professionals and experts to develop effective programs to address occupational disease. As an organization that brought together professional industrial hygienists, business groups, government officials, academics and researchers it serves as a means for understanding the intertwining of industrial and academic agendas. We explore some of the issues that arose regarding public policy and scientific investigations, asking: Under what conditions is it appropriate for professionals and scientists to work together with industrially sponsored organizations? What are the pressures that shape research questions, the range of possible solutions, and the control of scientific data? How can technically trained individuals avoid real or perceived conflicts of interest? At what point does the ostensibly disinterested goals of professionalism conflict with the self-interest of the sponsoring organizations?

- tional industrial standards of between 5 and 10 mppcf were not found to prevent the occurrence of silicosis." Rather, in the early 1930s, they pointed out that standards were developed in part because they "could be reached by the use of economically practicable ventilating devices." See: "Effect of Dust on the Lungs," *American Journal of Public Health*, 20 (April, 1930), 372.
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 53. *History of Industrial Hygiene Foundation* (Pittsburgh PA: Mellon Institute, 1956), 2-3; Air Hygiene Foundation of America, *Proceedings of Annual Meeting and Research Program* (Pittsburgh PA: April 1, 1937), 12-14. For examples of the aggressive public relations campaign that the Foundation waged both within industry as well as in the popular press, see, Air Hygiene Foundation, "Progress Reports," Mellon Institute of Industrial Research, Carnegie Mellon University Archives, Papers of the Mellon Institute.
 54. Air Hygiene Foundation of America, Inc., "Special Meeting of Members," Pittsburgh, PA, Nov. 30, 1937.
 55. Alfred Hirth to Board of Trustees, Air Hygiene Foundation of America, January 31, 1938, National Archives, Record Group 70, (Records of the U.S. Bureau of Mines), Box 2534, 022, 1937.
 56. McMahon to Weidlein, January 16, 1939. Carnegie-Mellon Archives, courtesy of Joel Tarr.
 57. John F. McMahon, "Confidential Memorandum to Dr. Weidlein and Dr. Hamor," April 5, 1940, courtesy of Joel Tarr.
 58. John F. McMahon to Dr. Hamer, March 5, 1941, Carnegie-Mellon Archives, courtesy of Joel Tarr.
 59. In 1941, the Foundation took the opportunity of America's impending entrance into World War II to change its name to Industrial Hygiene Foundation of America. See: Air Hygiene Foundation of America, *Fifth Annual Meeting of Members*, Pittsburgh, PA. Nov. 12th-13th, 1940, pp. 1-5; Industrial Hygiene Foundation of America, *Sixth Annual Meeting of Members*, Pittsburgh, PA. Nov. 12-13, 1941. See also, John F. McMahon, "Progress Report for Week Ended June 29, 1940," Mellon Institute of Industrial Research, Carnegie Mellon University Archives, Papers of the Mel-
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 37. Air Hygiene Foundation of America, Inc., “Annual Meeting of Members,” Pittsburgh, PA, Feb. 11, 1936, pp. 4-5.
 38. E. R. Weidlein, “Plan for Study of Dust Problems,” in W. G. Hazard to Dr. L. R. Thompson, March 21, 1935, National Archives, Record Group 90, “State Boards of Health,” (0875-96-49, Pittsburgh, PA).
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become members of the club. They included: Daniel Harrington, F. B. Meriwether, W. P. Yant and C. E. Brown of the U.S. Bureau of Mines; C. O. Sappington, of Chicago, Illinois; E. G. Meiter, of Employers Mutual Insurance Company; Philip Drinker and Theodore Hatch of Harvard School of Public Health; W. I. Clark of the Norton Company; A. J. Lanza, W. P. McConnell and J. W. Fehnel of Metropolitan Life Insurance Company; James A. Britton of Northwestern University Medical School; W. G. Hazard of Owens-Illinois Glass Company; R. R. Sayers, Albert E. Russell, R. R. Jones, J. J. Bloomfield and DallaValle of the U.S. Public Health Service; Leroy U. Gardner, Donald Cummings, Homer Sampson, Andrew Radlin and Thomas Durkan of Saranac Laboratory; George Brink, John Cunningham and A. R. Riddell of Toronto, Canada; H. K. Pancoast and E. P. Pendergrass of University of Pennsylvania; A. S. Gray and Warren Cook, Connecticut State Department of Health; T. Lyle Hazlett and Edgar C. Barnes of Westinghouse Electric and Manufacturing Company.

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 15. Theodore F. Hatch and Eugene P. Pendergrass, "The Konicide Club (1932-1940) A Brief History," *Journal of Occupational Medicine*, 19 (May, 1977), 351-52. At that meeting L. U. Gardner presented a brief sketch of "What is Known About Asbestosis."
 16. William P. Yant to Mr. Fieldner, January 5, 1935, National Archives, Record Group 70 (Records of the Bureau of Mines), Box 2201, File: 437.4 (1935). The founding members of the Club and the committees of the Air Hygiene Foundation overlapped significantly. Drinker, Hatch, Lanza, Gardner, Pendergrass, Sayers, Dreesen, Hazlett, Sander, Sayers, DallaValle, Cook, Yant, Jones, among others formed the core of the Engineering and Medical Committees of the Foundation.
 17. In late 1936, the members of the Club met in the Metropolitan Life Insurance Company's headquarters in New York City in a session organized by Met Life officials A. J. Lanza, W. P. McConnell and William Fehnel. The following year the club was hosted by the Montreal Mining Company of Montreal, Wisconsin "with whom the Saranac Laboratory had close association." In January, 1939, the session was "devoted to the health problems of the asbestos industry" and it seems that there were no subsequent meetings under the formal sponsorship of the Konicide Club. See: Theodore F. Hatch and Eugene P. Pendergrass, "The
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ical, legal, social and economic implications of the early silicosis crisis without ever providing the work force with the information it needed to protect itself and to make informed decisions about the safety of the work place (75). In the 1970s and 1980s, faced by the continued existence of silicosis and a new spate of lawsuits, industry once again mobilized to downplay the existence of the disease and to insist once again that technical solutions could be found to prevent it in the future. In the 1970s and 1980s the public health community once again placed the control of silicosis on the public health agenda, identifying it as a serious occupational danger. In the early 1970s, insurance companies in California documented over 1,000 deaths from the disease. In the shipyards of Louisiana and Texas, researchers at Tulane University documented at least 100 cases of silicosis among sandblasters. In 1974, following a series of studies sponsored by the National Institute of Occupational Safety and Health that detailed deaths in Texas, NIOSH called for the banning of sand in abrasive blasting and the lowering of the PEL by one-half in other silica industries. In the late 1980s, the New Jersey Department of Health documented that over four hundred cases of silicosis had occurred in the state between 1979 and 1987. More recently, numerous cases of silicosis have been diagnosed in the West Texas oil fields where sandblasters hired to clean pipes and storage tanks are now coming down with the disease. Despite the assurances of industries that argued (and still argue) that the disease was under control, NIOSH once again issued a silicosis *Alert* in 1992 calling for the banning of sand in abrasive blasting and a reduction in the allowable PEL (76). Certainly, silicosis is clearly still with us despite decades of assurance that it is a disease of the past. It is unclear, however, whether public health concerns will outweigh economic interests and political power in the public policy debate over risk and health.

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ican Industrial Hygiene Association in 1947 (70). He and other Foundation leaders complained that general practitioners were keeping the silicosis issue alive by diagnosing silicosis too frequently. Doctors, pressed by the demands of workers and their families, and trying to meet the rigid criteria of state compensation systems, were too quick to equate breathing difficulties after a lifetime of work in a dusty trade with a diagnosis of silicosis. It was time to write silicosis' "obituary." In a 1945 symposium on "accurate diagnosis of silicosis," sponsored by the Foundation, Leroy U. Gardner, the Trudeau Foundation's Director, and a member of the IHF's Medical Committee, apologized for devoting a session "to such a trite and hackneyed subject." But attention was necessary because far too many doctors and technicians were still diagnosing silicosis when, in fact, few such diagnoses were appropriate (71). Dr. O. A. Sander, also of IHF's Medical Committee, went even further, maintaining that the term pneumoconiosis should be redefined because it was "widely misunderstood" to imply pathology. Sander held that pneumoconiosis should simply mean "dust added to the lungs without any implication of fibrosis or disability" (72). Sander suggested that there were really very few deleterious dusts. Cotton dust, for example, was too often suspected of causing pneumoconiosis. He suggested that byssinosis, due to cotton fiber exposure, was really nothing more than "an allergic response resulting in typical asthma, without any demonstrable lung pathology." He mentioned this "only to show how easy it is to be misled in the pneumoconiosis field" (73).

A review of articles listed in *Index Medicus* for the period between 1929 and 1964 confirms that the American medical community accepted this view of industrial lung disease. The number of articles published worldwide on the pneumoconioses rose during the Depression, tapered off during World War II, and then rose dramatically during the late 1950s and early 1960s with the growing attention to coal workers pneumoconiosis and asbestos-related disease. In the United States a similar pattern prevailed during the Depression but diverged dramatically after World War II. While the percentage of pneumoconiosis articles published worldwide expanded, the percentage in American journals declined from over one-third of all publications during the Depression to only 13.2 percent by 1961-64. The absolute number of articles on the pneumoconioses also steeply declined from over 50 per year between 1933-1936 to only 31 per year by 1957-1960.

- lon Institute, Industrial Fellowship 259-6 where McMahon reports that Dr. Meller and Dr. Lanza met at Lake Chautauqua, N. Y. "to discuss changes in the Foundation's research program for next year. It was felt that in view of world affairs and emergency production for defense, the Foundation should emphasize work of immediate, practical plant benefit."
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 75. See, Gerald Markowitz and David Rosner, "The Limits of Thresholds," *American Journal of Public Health*, February 1995.
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of the past. Professionals were the new authorities in the field of industrial hygiene, and they all agreed with the leaders of the Industrial Hygiene Foundation that "the dangerous trades of our fathers has (*sic*) all but disappeared." Dust was now considered more of a danger to the inner workings of machinery than to the lungs of men. "Not infrequently we find nuisance dust exposures to be more injurious to the mechanical equipment than to workmen," these experts declared (63). In 1946, *Business Week* wrote that the only silica problem was that some workers were hypersensitive to dust. In the most absurd manifestations of this consensus, silicosis was presented as a product of racial or ethnic characteristics that made certain workers susceptible. In one mill where there were some cases of silicosis still appearing, the magazine claimed that this was just proof that the company should have avoided hiring blond workers. "Brunettes, who generally have more hair on the body, naturally have more hair in the nostrils, which tends to keep silica dust from reaching the lungs" (64). At the prestigious Saranac Laboratory symposium on silicosis, one state official echoed earlier management arguments of the 1920s and 1930s that claimed that technological innovation had eradicated the silicosis problem: "The most important accomplishment of these preventive measures is that silicosis is becoming a negligible factor, and that in the future it will largely be stamped out by preventive measures that have been instituted" (65). The Industrial Hygiene Foundation joined with researchers at Saranac to lend authority to this position. By 1955, Andrew Fletcher, the Board Chairman of the Industrial Hygiene Foundation, told the annual meeting that "both industry and the Industrial Hygiene Foundation can look back proudly on their achievements. Occupational diseases are for the most part eliminated," he maintained in a naive or self-congratulatory address entitled "Changing Concepts of Industrial Health" (66).

The interlocking relationship between industry, technical experts, lawyers, and the very foundations involved in silicosis research raised few ethical qualms for scientists during the 1930s and 1940s. In fact, even the most prestigious centers associated with the Air Hygiene Foundation, such as the Trudeau Foundation in Saranac Lake, New York, openly and sometimes aggressively pursued corporate funding because there were few other alternatives. Traditionally the Saranac Laboratory had conducted studies of tuberculosis and had gradually involved itself in the 1920s in studies of the relationship between tu-
