Responses to Occupational Disease: The Role of Markets, Regulation, and Information*

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I begin to work in the carding-room . . . and the fluff got into my lungs and poisoned me . . . . Little bits, as fly off fro' the cotton when they are carding it . . . . Some folk have a great wheel at one end o' their carting rooms to make a draught, and carry off the dust; but that wheel costs a deal of money . . . and bring in no profit: so its but a few of the master as will put 'em up . . . .

Work conditions that can produce debilitating and often fatal occupational diseases are effectively unregulated in many American workplaces. Few workers receive workers' compensation for their occupational diseases and fewer still receive tort recoveries. The Occupational Safety and Health Administration (OSHA), mired in controversy, has adopted final regulations for only twenty-four of the hundreds of substances that may require regulation. Almost all of the reforms proposed to increase regulatory effectiveness remain unadopted.

This article analyzes the role of markets, regulation, and information in the prevention of occupational disease. Part I examines the existing evidence concerning the extent of occupational disease and concludes that little is known except that there is considerable potential for epidemic outbreaks. Part II assesses the market's failure to provide additional information concerning the nature and causes of occupational disease. Part III analyzes the consequences of the lack of information about occupational disease and concludes that while there are many reasons for the failure of the labor markets and government regulation to protect workers from occupational disease, lack of information is the key element. Part IV analyzes recent attempts to force the disclosure of information held by employers in order to improve the performance of labor markets and government regulation and to increase scientific research into occupational disease. Finally, Part V discusses proposals to shift the financial consequences of risk posed by lack of information about occupational disease away from workers, where it is presently located, to employers and the public.

I. Evidence of Occupational Disease

Articles and books about occupational disease routinely report dramatic evi-
idence of its epidemic proportions. Data revealing that thousands die or are disabled each year are regularly cited.\(^2\) Documentation of specific instances of diseases that have taken terrible tolls is readily available.\(^3\) The usefulness of these studies is limited, however, by the nature of the data upon which they rely. There are tens of thousands of chemicals used in the workplace, thousands of which may be toxic or carcinogenic.\(^4\) In order to establish the specific dangers posed by these chemicals, researchers must use animal experimentation and epidemiological studies. Using these methods to correlate exposure to vapors or dusts with harmful effects is difficult. As a result, estimates of the total incidence of occupational disease are little more than a statistical house of cards.

A. ANIMAL TESTS

Exposure to many chemicals and dusts is fatal to experimental animals. The International Agency for Research on Cancer (IARC), for example, found that of 442 chemicals, groups of chemicals, and industrial processes thought to be hazardous, there was convincing proof in the published scientific literature that thirty-two percent of the chemicals studied (143 chemicals) were carcinogenic in experimental animals.\(^5\)

Although a finding that a substance is toxic to animals is a useful indication of danger to humans, the exact dimensions of that danger are difficult to extrapolate. Animal studies may not predict human illnesses caused by low expo-

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2. See, e.g., N. Ashford, Crisis in the Workplace 11 (1976) (one-half of all cancer cases complicated by occupational factors); Reutter, Workmen's Compensation Doesn't Work or Compensate, Bus. & Soc'y Rev., Fall 1980, at 39 (650,000 victims of asbestosis, silicosis and other occupational diseases); Comment, Occupational Carcinogenesis and Statutes of Limitation: Resolving Relevant Policy Goals, 10 Envtl. L. 113, 111 (1979) (hundreds of thousands of Americans diseased and disabled by the occupational environment); Note, Compensating Victims of Occupational Disease, 93 Harv. L. Rev. 916, 916 (1980) [hereinafter cited as Compensating Victims] (at least 390,000 new cases of disabling occupational illnesses and as many as 100,000 deaths from work-related diseases occur annually); Rothstein, OSHA After Ten Years: A Review and Some Proposed Reforms, 34 Vand. L. Rev. 71, 71 (1981) (up to 20\% of all cancers are related to occupational and environmental exposure).


ures or by the interaction of several chemicals. Moreover, humans may be more or less susceptible to toxic effects than the animals studied. For most chemicals, however, the most serious problem is that they have not yet been tested or tested adequately. Reliable animal experimentation for a chemical takes three to five years and costs several hundred thousand dollars. As a result, thousands of chemicals remain untested.

B. EPIDEMIOLOGICAL STUDIES

Epidemiological studies can be used to verify the results of animal experimentation, but because of the considerable expense involved, few chemicals are studied by this method. Epidemiological data have been published for only fourteen percent of the more than 400 chemicals involved in the IARC review, for example. When a chemical is studied, the results are often compromised by methodological difficulties. Each of the two techniques used, interview reports and case studies, involves its own set of problems.

Researchers who use the interview reports technique first determine the extent, or prevalence, of a disease in a group of workers by interviewing the workers or their families or by obtaining health information from sources such as life insurance applications, social security records, or death certificates. The researchers then compare the prevalence of the disease in the worker group to its prevalence in a control group of nonexposed workers in the same factory or community or a control group of people with similar personal characteristics in the population at large. The greater the comparative occurrence of the disease in the worker group, or relative risk, the more likely it is that the exposure caused the disease. Interview studies which show that exposed workers are at a greater relative risk are used to establish the workplace origin of some types of cancer. A few chemical studies show a relative risk of cancer for exposed
workers as high as 200 times the risk for unexposed workers.\textsuperscript{15}

The accuracy of these estimates is in doubt, however, because the long latency period for many occupational diseases renders interview study research unreliable. The period between exposure and the onset of a disease can range from four to forty years.\textsuperscript{16} If research is done near the end of the latency period, many workers who should be interviewed will have left the workplace and even the community where they were exposed. Costly detective work may locate some of these workers, but others will not be found.\textsuperscript{17} Incomplete and inaccurate records can further hinder the search for the workers.\textsuperscript{18} To avoid these difficulties, researchers typically study workers whose exposure was relatively recent and who are therefore more likely to be working at the location of their exposure.\textsuperscript{19} The problem with this approach is that it excludes workers who become ill after the study is complete. Studies based on recent exposure will therefore underestimate the relative risk of a disease.\textsuperscript{20}

Researchers face similar difficulties in determining the prevalence of the disease in the nonexposed control group. Use of the population at large as a control group will cause relative risk to be understated because the population will include more ill persons than will a control group of nonexposed workers.\textsuperscript{21}

Epidemiological research has other limitations. Studies that measure the consequences of workplace exposures that occurred twenty or thirty years before may not accurately represent present risks, particularly if the level of exposure has changed.\textsuperscript{22} Exposures that present only a moderate to low risk may not be identified because the number of workers interviewed is too small a statistical sample to reveal the risk.\textsuperscript{23} Finally, although many experts believe that diseases like cancer are caused by a combination of factors, including the synergistic effects of various chemicals, study results do not permit the relative impact of these causes to be analyzed.\textsuperscript{24}

Using evidence of relative risk calculated from the actual incidence of a disease, researchers estimate the additional or excess number of persons who will

\begin{thebibliography}{99}
\bibitem{15} See P. Cole & M. Goldman, supra note 14, at 173 (relative risk of liver cancer 200 times greater for workers exposed to vinyl chloride).
\bibitem{16} Davis, supra note 13, at 105, 116-17; Robblee, The Dark Side of Worker's Compensation: Burdens and Benefits in Occupational Disease Coverage, 2 Indus. Rel. L.J. 596, 609 (1978).
\bibitem{17} Davis, supra note 13, at 116; Monson, Effects of Industrial Environment on Health, 8 Envtl. L. Rev. 663, 667 (1978).
\bibitem{18} P. Barth, Workers' Compensation and Work-Related Illnesses and Diseases 29-30 (1980); Monson, supra note 17, at 667-68.
\bibitem{20} P. Barth, supra note 18, at 29.
\bibitem{21} Mancuso, Problems and Perspectives in Epidemiological Study of Occupational Hazards in the Rubber Industry, 17 Envtl. Health Persp. 21, 23 (1976); Davis, supra note 13, at 106-07. The workforce is drawn from the healthiest members of the population. Comparison of worker illnesses to those of the general population will produce an underestimated risk of occupational diseases. Cancer and the Worker, supra note 9, at 22.
\bibitem{22} Mancuso, supra note 21, at 22; Robblee, supra note 16, at 610.
\bibitem{23} Robblee, supra note 16, at 609.
\bibitem{24} Id. at 610; see 12 O.S.H. Rep. (BNA) 584 (1982) (excess rate of lung cancer for auto workers may be attributable to cigarette smoking rather than to workplace chemical exposures).
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become ill or die from occupational disease by multiplying the risk factor times the number of employees exposed to a hazard. For example, excess deaths from exposure to asbestos are estimated at over two million.\textsuperscript{25} Other chemicals and dusts are estimated to cause several thousand additional illnesses per substance per year.\textsuperscript{26} To use this method, researchers must assume that the relative risk for every worker exposed to a substance is the same as the risk for the workers actually studied.\textsuperscript{27} Some of the nonstudied workers will have higher or lower exposures because they were involved in different manufacturing processes or were exposed for longer or shorter periods of time.\textsuperscript{28} Some scientists address this problem by limiting their excess death estimates to those workers in industries for which research data exist. The estimates of excess deaths in these studies are remarkably smaller than similar estimates in studies applying a relative risk factor to all industries that use a certain substance.\textsuperscript{29}

Relying on estimates of excess deaths, academic researchers conclude that three to five percent of all cancers are attributable to occupational exposure.\textsuperscript{30} By comparison, government scientists estimate the percentage at twenty to thirty-eight.\textsuperscript{31} The estimates differ because of the method employed by each group to adjust for the lack of information about most occupational chemicals and dusts. Academic researchers conservatively assume that the total incidence of occupational disease is no worse than the average incidence for the chemicals and industries studied.\textsuperscript{32} The government estimate assumes that some of the unstudied substances produce occupational illnesses in the magnitude of the worst results revealed by existing research.\textsuperscript{33}

Researchers who use the second kind of epidemiological study, the case reports technique, estimate the toxic consequences of chemicals and dusts by examining public mortality and illness records. A widely quoted\textsuperscript{34} 1972 gov-
ernment report based on case records determined that 390,000 occupational diseases and 100,000 deaths from those diseases occur annually. This estimate was derived from 1951 British mortality data comparing deaths of persons in various occupational groups with the average number of deaths of persons with similar characteristics in the country as a whole. Outdated British records were used for the study because no comparable sources of American data were available.

OSHA and several state safety and health agencies now require employers to report occupational illnesses. The reliability of these reports, however, is in doubt because many times they do not confirm widely accepted epidemiological and animal data. There are two reasons for this discrepancy. At the time they become ill, many employees no longer work for an employer required to report work-related diseases. Employers also have a disincentive to report an employee illness as work-related, since such an admission may impose liability on the employer for the financial consequences of the illness.

Other studies use different techniques to establish which illnesses reported in public records are work related. For example, a recent study of national cancer mortality statistics for men over forty-five years of age identified an increase in occupational cancers by assuming that certain types of cancer were occupational in origin while other types were not. Since various types of cancer have both occupational and nonoccupational origins, it is difficult to assume that a particular type of cancer is work related. Moreover, the death certificates from which mortality data are derived often do not give an accurate or precise cause of death.

In another study, the Department of Labor estimated that approximately 11.5 percent of social security disability payments were made to victims of occupational diseases. Researchers derived this figure by asking a representative sample of social security disability recipients whether they thought their illnesses were work related. The accuracy of this technique is obviously limited by its reliance on self-diagnosis by respondents and by its failure to include the many persons disabled by occupational disease who do not receive social security compensation.

36. P. Barth, supra note 18, at 16-17. An occupational death rate was determined by assuming that all deaths in excess of the average mortality rates were occupational in origin. This British death rate was then applied to an estimate of the number of American workers to produce the totals reported. Id.
38. P. Barth, supra note 18, at 21, 23; Interim Report, supra note 19, at 39.
39. See infra text accompanying notes 103 to 155 (discussing workers' compensation).
40. Davis, supra note 13, at 129.
42. P. Barth, supra note 18, at 29-30.
43. Interim Report, supra note 19, at 44-45.
44. Id. at 44. The responses of recipients were cross-checked to determine whether those reporting occupational causation had worked in the industries cited by epidemiologists. The Department suggested that this cross-check showed that self-reporting produced information which was consistent with data from other sources. Id. at 44-46. The Department did acknowledge that its estimate was understated because some recipients would not attribute their diseases correctly to an occupational origin when there was a long latency period. Id. at 48.
45. See infra notes 110 to 111 (discussing workers' compensation and social security disability payments).
C. LIMITS OF THE DATA

While government reports claim to have documented the epidemic proportions of occupational disease, the statistical evidence is so equivocal that the extent of the problem remains unknown. Scientists do agree, however, that there have been significant outbreaks of occupational disease affecting thousands of workers. Moreover, they agree that thousands of potentially hazardous chemicals remain in the workplace. Unfortunately, most of these chemicals have not yet been studied, and information about those that have been studied is often sketchy. Part II of this article explores the reasons for the lack of adequate information about occupational disease.

II. PRODUCTION OF INFORMATION ABOUT OCCUPATIONAL DISEASE

An efficient market requires that both buyers and sellers have complete and equal information about the subject matter of a bargain. Employer and employee demand for information about occupational disease, however, is limited because the cost of its acquisition often exceeds the benefits from its purchase. Further, it is often financially disadvantageous for employers to share information they obtain with their employees. Finally, even when employees demand the information, suppliers will not always find it profitable to provide it.

An employer will produce the information necessary to recognize and abate workplace hazards if the costs of abatement are less than alternative costs. Those alternative costs are ex ante compensation, in the form of wage premiums, or ex post compensation, under the workers' compensation and tort systems. Demands for wage premiums, however, are limited by the general lack of information. Even when hazards are known, workers may lack sufficient bargaining power to obtain wage premiums,46 and the workers' option to quit may be limited by the unavailability of other employment.47 Further, regulation in the form of workers' compensation, tort awards, or OSHA emission standards, has only a limited impact on many employers.48

To the extent that employers have an incentive to obtain information about health effects, there are corresponding incentives to keep the data confidential and to prevent others from obtaining similar information.49 Numerous instances of employer "cover-ups" of research revealing adverse health effects have been reported.50 Similarly, employers have prevented independent re-

47. See infra text accompanying notes 80 to 82 (discussing limitations on workers' mobility); W. Viscusi, Employment Hazards: An Investigation of Market Performance 274 (1979) [hereinafter cited as Employment Hazards].
48. L. Bacow, supra note 46, at 35; Employment Hazards, supra note 47, at 274.
49. See N. Ashford, supra note 2, at 336, 408 (inequality of access to information creates incentives to keep information confidential; possession of information becomes a bargaining advantage). But see Pressures in Today's Workplace: Hearings Before the Subcomm. on Labor-Management Relations of the House Comm. on Education and Labor, Part 2, 96th Cong., 1st Sess. 145 (1979) (testimony of Professor Alan Westin) ("many" companies share data with employees).
searchers from obtaining information about the nature and severity of health hazards.\(^5\) Early attempts to study brown lung disease, for example, were stymied by the refusal of mill owners to give independent occupational health scientists access to their plants and records.\(^5\)

Employers also may legitimately refuse to reveal the identity of product ingredients and the degree of worker exposure to those ingredients because both kinds of information may be regarded as trade secrets.\(^5\) The law has traditionally recognized that disclosure of trade secrets can discourage research and therefore has protected the interests of inventors in the fruits of their innovative efforts. For example, secrecy agreements signed by employees are enforceable as a matter of state contract law, and theft of trade secrets may result in both civil and criminal liability. Under federal law, government employees may face criminal penalties for disclosure of trade secrets obtained during the course of their employment.\(^5\)

While employees have a considerable incentive to determine whether they are being endangered in their workplaces, no researcher could profit from selling information to unorganized employees.\(^5\) The problem is that information has a "public goods" character: its use by one consumer does not necessarily diminish its value to other consumers. As a result, employees who purchased information about workplace dangers would try to resell it in order to recoup at least some of the purchase price. No researcher could make a sufficient number of sales in such a situation to recover the costs of the research and realize a reasonable profit.\(^5\) While a researcher could negotiate secrecy agreements with buyers, enforcement of those agreements would be unrealistic if there were very many purchasers.\(^5\) The researcher could sell the information to a smaller number of customers to simplify enforcement,\(^5\) but, as a practical

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51. N. ASHFORD, supra note 2, at 408; Robblee, supra note 16, at 607.
52. Robblee, supra note 16, at 613.
54. See infra note 444 (discussing disclosure of trade secrets to third parties).
55. Information will be produced in a purely private market only if there is a demand for it that can be profitably supplied. Greenawalt & Noam, Confidentiality Claims of Business Organizations, in BUSINESS DISCLOSURE: GOVERNMENT'S NEED TO KNOW 398 (H. Goldschmid ed. 1979).
57. Greenawalt & Noam, supra note 55, at 400-403.
58. Id. at 399; see Demsetz, Information and Efficiency: Another Viewpoint, 12 J.L. & ECON. 1, 12 (1962) ("Indivisibilities in the use of knowledge become important only when the costs of contracting are relatively large.").
matter, information offered on this basis would be so expensive that no one worker or group of workers could afford it.\textsuperscript{59} Although large labor unions are in a position to purchase some information about occupational disease, most American workers do not belong to a union.\textsuperscript{60} Moreover, many unions have decided that the vigorous pursuit of health information is too costly. Since many occupational diseases do not appear for twenty or thirty years, union members and their leaders often view the problem as less pressing than concerns about wage levels and job security.\textsuperscript{61} As a result, unions generally have been unwilling to give management significant concessions in these areas in order to obtain cooperation in the development of safety information.\textsuperscript{62} Management has therefore been successful in delaying or preventing the creation of additional useful information about occupational disease. The result of this lack of information and other deviations from the smoothly functioning labor market economic model is that workers receive little protection from, or compensation for, occupational disease.

III. Market Performance

A. Labor Markets

Private markets work on the basis of self-interest. Buyers demand the goods or services they most desire and sellers obtain the greatest financial reward by providing those products. Economists regard this result as efficient because scarce resources are not utilized to provide products that are less desirable to consumers.\textsuperscript{63} In a truly efficient market, the cost of a product must reflect the value of all the resources that are used for its manufacture and production. Therefore, if a manufacturing process produces toxic substances that cause illnesses, the manufacturer should pay for all of the costs associated with those illnesses.\textsuperscript{64}

Ordinarily, there would be no incentive for a manufacturer to pay for these

\textsuperscript{59} See supra note 9 (animal studies expensive and time consuming). A sale of research information to a purchaser with sufficient resources is plagued by a second problem. Any potential purchaser of information will have trouble determining its value without knowing the results of the research. If the researcher reveals the information to the potential buyer, the information cannot then be sold. As a consequence, the sale price of any information will be discounted either because the buyer is assuming some risk that the information will not be useful, or because part of the information was revealed in order to make the sale. Cf. Arrow, supra note 56, at 615 (use of information in any productive way is bound to reveal it, at least in part). Rather than engage in expensive research in the hope that it can be sold under these circumstances, research firms will sell only their services and not a final product.

\textsuperscript{60} Bureau of the Census, U.S. Department of Commerce, Statistical Abstract of the United States: 1982-83, at 376, 408 (1978 total civilian labor force of 102,251,000; 21,784,000 union members).

\textsuperscript{61} See infra note 102 and accompanying text (union members may be unwilling to strike over noneconomic issue).

\textsuperscript{62} See infra notes 87 to 102 and accompanying text (discussing unions' failure to make employee health an important concern in collective bargaining).


\textsuperscript{64} J. Mendeloff, Regulating Safety: An Economic and Political Analysis of Occupational Safety and Health Policy 7, 9 (1979). Unless the manufacturer pays for all of the costs of production, a product will be sold for a price that is too low in the sense that the price will not reflect all of the social costs of production. At that price, more of the product will be sold than if it had been properly priced. As a result, greater pollution will be imposed on society than if the product were properly priced. Id.
external costs created by its manufacturing process. If, however, the law authorized persons harmed by toxic emissions to enjoin their production, the polluting firm would be required to purchase the “right” to continue to pollute from those adversely affected. Faced with this prospect, the manufacturer would expend resources to abate the toxic emissions up to the point at which it would be less expensive to purchase the right to pollute. By comparison, if the law authorized the manufacturer to pollute, persons damaged by the toxic emissions would band together to pay the manufacturer to control pollution. Preventive efforts would be purchased up to the point at which the reduction in emissions would no longer be worth the purchase price. Professor Coase has suggested that in a smoothly functioning market the amount spent on prevention and the level of toxic emissions would be the same under either rule. Under either legal regime, government action would be necessary only to enforce the necessary contract and property rights.

In the workplace, however, the employer would have to purchase the right to pollute under either set of rules. If workers were authorized to enjoin the production of toxic emissions, the employer would have to purchase from the employees the right to continue production. If workers could not seek an injunction, they would demand compensation in the form of wage premiums or take jobs with equal pay and less risk. If the payments made to workers under either set of rules accurately reflected the risk faced by the employees, the employer would have absorbed, or internalized, what were previously external costs.

The actual existence of wage premiums for hazardous work predicted by the economic model has been difficult to establish empirically. A few studies have found that the risk of death from workplace accidents is reflected in wage rates. One study found similar evidence for nonfatal injuries. Other economists have characterized the evidence as inconsistent support for the existence of wage premiums. Moreover, because of the lack of data on occupational disease, most studies of wage premiums have been limited to the risk of injury rather than the risk of disease. Professor Viscusi, who concluded that modest wage premiums were paid to workers, did find that there were no statistically distinguishable differences between compensation for known health and known safety risks. By comparison, Dr. Irving Selikoff, in a study of compen-
sation for asbestos-related disease, found a "virtual absence of a significant wage premium" for asbestos insulation workers, even though the powerful construction unions and the workers themselves knew of the virulent health hazard presented by asbestos.

Researchers have offered various explanations for the apparent failure of the wage premium theory. One explanation is that wage premiums will be paid only if some workers are mobile and can easily take less risky jobs if their employers do not pay adequate premiums. With high unemployment, a change in jobs is not a realistic alternative for many people. Further, the transaction costs associated with switching jobs, such as loss of pension rights and seniority, the necessity of becoming familiar with a new employer, and the expense of moving, may be too high for many workers. These factors may explain in part the results in the Selikoff study. As a practical matter, long-time asbestos insulation workers may have been unwilling to surrender seniority and other job rights and may have been unable to acquire new job skills. In addition, the most mobile workers have traditionally been the young, who would be the most likely to underestimate or ignore the risk of contracting a work-related disease.

A second explanation is that wage premiums will be paid only if workers are well informed about the risks they face. For the many substances about which precise information is generally unavailable, the theory fails because workers do not have the information needed to bargain for wage premiums.

A third explanation is that wage structures have become fixed and resistant to change in large industries that use hierarchical wage classifications. This occurs because unions wish to avoid situations in which some workers receive disproportionately more or less than other workers because their jobs have

77. I. SELIKOFF, DISABILITY COMPENSATION FOR ASBESTOS-ASSOCIATED DISEASE IN THE UNITED STATES 577 (1981). The study compared the wages of insulation workers, bricklayers, and all construction industry journeymen in various cities over time. The study did indicate that the fringe benefits paid to insulation workers had increased relative to those paid to members of other skilled trades, but still not enough to support the existence of a significant wage premium even if wages were broadly defined to include wages and fringe benefits. Id. at 577-78.

78. Id. at 570-71; see Risk By Choice, supra note 73, at 55-56 (unionized workers receive larger risk premiums).

79. R. SMITH, supra note 71, at 31.

80. See Bureau of Labor Statistics, U.S. Dept of Labor, Employment and Earnings 117 (Jan. 1984) (unemployment rate of 8.1%). Unemployment is even higher than the national average in some areas where the most dangerous work is found (the steel industry, for example). See id. at 149-53 (Gary, Hammond, E. Chicago—14.1%; Pittsburgh—12.2%; Birmingham—12%; Allentown, Bethlehem, Easton—9.2%). See also Getchow, The Day Laborer's Toil Is Hard, Pay Minimal, Security Nonexistent, Wall St. J., June 22, 1983, at 1, col. 6 (describing the exploitation of day laborers in Houston who work for the minimum wage in dangerous jobs for which they receive no training and generally no workers' compensation if injured).

81. Employment Hazards, supra note 47, at 274.

82. See Williams, Ten Minutes' Work for 12 Hours' Pay? What's the Catch?, Wall St. J., October 12, 1983, at 1, col. 4 (repairmen for nuclear power plants, who can receive in three months radiation exposure that is the equivalent of 150 chest x-rays, overlook risks for good pay and steady work).

83. Risk By Choice, supra note 73, at 41.

84. See supra text accompanying notes 2 to 45 (discussing unavailability of information about occupational disease). Professor Viscusi has found that workers are generally aware of many health-related concerns, although the dangers posed by the bewildering array of toxic substances are difficult to assess precisely. Risk By Choice, supra note 73, at 62.

85. See J. MENDELOFF, supra note 64, at 11.
become more or less risky. For example, between the 1963 and 1971 job classifications in the steel industry there were no changes in the hazard and surroundings ratings of more than 600 jobs, although it is likely that technological changes alone had caused at least some changes in the relative safety of the jobs.  

For organized workers, collective bargaining between employer and union could be, but is not, a powerful vehicle for achieving changes in the workplace to decrease risks. Unions traditionally have not shown much interest in bargaining over health and safety issues. There was very little union political interest in health and safety before the passage of the Occupational Safety and Health Act in 1970, and occupational disease did not become a union bargaining concern until the late 1970s. Although there is some evidence that union concern with workplace dangers has increased in recent years, it is not clear that union bargaining activity has had any significant effect in promoting the health and safety of workers.

A recent analysis of 400 collective bargaining agreements revealed that eighty-two percent contained occupational safety and health provisions, but these provisions seldom provided workers with significant rights they would not have had anyway. For instance, twenty-seven percent of the contracts studied contained provisions that merely required the employer to comply with federal, state, and local safety and health laws, and forty-six percent had provisions concerning safety equipment, such as machine guards and safety glasses, which OSHA regulations required in most instances anyway. On the other hand, only twenty-five percent of the contracts addressed hazardous work, and, of those, only twenty-four percent guaranteed employees the right to refuse hazardous work, a right which is protected under federal law only in certain instances. Further, only five percent of the hazardous work provisions

86. Id. at 11 n.8. See also L. Bacow, supra note 46, at 67-74, 92 (steel workers refused to forgo incentive income when coke-oven jobs became safer).
87. Health and safety are “mandatory subjects of bargaining” within the meaning of the National Labor Relations Act. Gulf Power Co., 156 N.L.R.B. 622, 625, enforced, 384 F.2d 822 (5th Cir. 1967). Bargaining is theoretically attractive as a solution to occupational hazards because, unlike more general government regulations, it can produce workplace specific solutions to problems. L. Bacow, supra note 46, at 56-58.
88. H. Northrup, supra note 4, at 194-95.
91. Id. at 95:2.
92. Id. at 95:1-95:2.
93. Id. at 95:3 (1983). The right to protest perceived unsafe or unhealthy working conditions, including the right to refuse to work under those conditions, is a protected concerted activity under § 7 of the NLRA. NLRB v. Washington Aluminum Co., 370 U.S. 9, 17 (1962). The reasonableness of the employees’ decision to protest is not relevant to its protected status, as long as they act in good faith. Id. at 16. This right, however, is not absolute. A major limitation is the statutory command that activity be “concerted,” which generally requires the involvement of two or more employees. Although a line of decisions had protected employees who acted alone but on a matter of obvious concern to all other employees, see Alleluia Cushion Co., 221 N.L.R.B. 999, 1000 (1975) (employee who reported OSHA violations protected), the Board recently overruled these cases and held that, where there is no collective bargaining agreement, activity must be engaged in with or on the authority of other employees in order to be concerted under § 7. Meyers Industries, 268 N.L.R.B. No. 73 (1984). Cf. NLRB v. City Disposal Systems, Inc., 52 U.S.L.W. 4360 (U.S. Mar. 21, 1984) (upholding as a reasonable interpretation of the Act the Board’s “Interboro doctrine,” under which a reasonable and honest assertion of a right contained in a collective bargaining agreement is deemed concerted, even if the employee acts
provided for wage rate retention when employees were temporarily transferred because of hazardous conditions or injury.94 Such rights generally are not guaranteed by existing law.95 Forty-five percent of the contracts established joint management-union safety committees96 but one recent study has shown that such safety and health committees make “little difference” in workplace health and safety.97 Moreover, the overwhelming emphasis of these contract provisions appeared to be on injury-related matters.

There may be several reasons for labor’s seeming failure to make health concerns a major issue in collective bargaining. First, unions generally do not possess the technical and financial resources necessary to determine hazardous exposure levels, to offer feasible alternatives to current methods of operation, and to monitor compliance with any agreement reached with an employer.98 Second, some unions apparently fear potential liability to their members if they assume any role in assuring workplace safety.99 Third, because most employers feel that safety and health concerns are intertwined with management of the production process, they may be reluctant even to discuss these issues with the union, much less to agree to change their production methods. Fi-

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94. See generally L. BACOW, OSHA AND THE POLITICS OF COLLECTIVE BARGAINING NEGOTIATIONS AND CONTRACTS (BNA) 95:3-95:4 (1983). 95. Neither the NLRA nor OSHA requires that employees be paid while they are not working or be transferred to a safer job at the same pay rate.


nally, a union will be successful in negotiating only if it is able and willing to enforce its demands with economic action. 100 Many unions may not be strong enough to sustain a strike against the employer, particularly if the employees are relatively unskilled and therefore easily replaced. 101 Even if the union could gain important concessions through striking, its members may not be willing to strike over a noneconomic issue which they view as less crucial than increased wages and fringe benefits. 102

B. REGULATORY MARKETS

There is little evidence that workers, even when aided by organized labor, obtain the wage premiums that economists predict they should receive for hazardous jobs. The federal government and the states have responded to this failure by regulating the labor market. In adopting this regulation, however, legislators failed to consider adequately that where there is inadequate information, the degree of protection will depend on the nature of the legal rules under which the regulation is imposed.

Legal rules can authorize a manufacturer to pollute until the public interest requires that the pollution be abated. In this scheme, the government, or any worker seeking government action, has the burden of proving that an emission is hazardous. If there is insufficient information to prove this, workers will continue to be exposed to the hazard until the information is developed. On the other hand, legal rules can authorize the government to restrain the use of a manufacturing process until the employer proves that it is safe. In this situation, workers will not be exposed to a chemical until sufficient information about its safety is developed.

Regulatory responses to occupational disease have authorized employers to pollute until the government has sufficient information to act. To be effective, however, this type of regulation requires the same missing information that in part caused the labor markets to fail. The following section examines the consequences of this discrepancy for regulation of the labor market.

1. Compensatory Regulation

Workers' Compensation. Under state workers' compensation systems, recovery is made available on a no-fault basis once it is determined that an injury or disease is work related. 103 Employer support for a no-fault approach

102. See Economic Adversity and Its Impact on Cotton Dust Rule Reviewed by Frumin, 13 O.S.H. REP. (BNA) 5-6 (June 2, 1983) (workers reduce safety complaints to avoid loss of jobs); cf. Comment, Unions' Right to Information About Occupational Health Hazards Under the National Labor Relations Act, 5 IND. REL. L.J. 247, 255 n.72 (1983) (only 110 of 560 locals follow up union's attempt to gain health and safety disclosure from employer).
103. The workers' compensation system, adopted by the states during the early 1900s, was seen as an important advancement over previous attempts to prevent occupational injury through the tort system. Tort recoveries were rare, primarily because the defenses of contributory negligence, assumption of risk, and the fellow servant doctrine absolved employers of liability in most cases. REPORT OF THE
was achieved by prohibiting workers covered by workers' compensation legislation from suing the employer for any remedy other than benefits under that system.\textsuperscript{104} Funds for compensation are obtained through charges levied on employers. Theoretically, employers are charged a premium based on the relative safety of their workplaces as measured by reported employee injuries and illnesses. Costs of work-related injuries and illnesses thus become costs to the firm.\textsuperscript{105} Employers will therefore engage in preventive safety efforts only as long as such efforts are less costly than the payments they must make to the workers' compensation fund.\textsuperscript{106}

In fact, few workers receive compensation for work-related illnesses. Studies estimate that only two to three percent of all workers' compensation payments compensate recipients for occupational disease.\textsuperscript{107} A 1980 U.S. Department of Labor report estimated that only about three percent of all workers severely disabled by occupational diseases received workers' compensation,\textsuperscript{108} and the payments they received replaced only about one-eighth of their lost wages.\textsuperscript{109} If these estimates are accurate,\textsuperscript{110} employers internalize little of the cost of occupational disease.\textsuperscript{111} The limited internalization occurs for six reasons.

First, there is little economic incentive for employers to spend money to prevent occupational disease. Decisions concerning how much to spend to prevent disease are not based on current workers' compensation expenses, which are the result of past actions, but on the likelihood that such efforts will prevent diseases in the future. Since future diseases may not occur until many years later, firms may heavily discount their consequences and spend little or nothing on prevention.\textsuperscript{112} Moreover, many firms are required to insure against

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\textsuperscript{NATIONAL COMMISSION ON STATE WORKMAN'S COMPENSATION 33-35 (July 1972) [hereinafter cited as NAT'L COMM'N REPORT].}
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\textsuperscript{104. NAT'L COMM'N ON STATE WORKMEN'S COMPENSATION LAWS, COMPENDIUM ON WORKMEN'S COMPENSATION 23 (1973) [hereinafter cited as COMPENDIUM]; F. Posner, \textit{A Theory of Negligence}, 1 J. LEGAL STUDIES 29, 34 (1972) (discussing history of negligence cases and evolution of no-fault approach).}
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\textsuperscript{105. INTERIM REPORT, supra note 19, at 76. Actual practice does not conform to this goal. See infra text accompanying notes 112 to 115 (discussing failure of employers to internalize costs of employee illnesses).}
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\textsuperscript{106. INTERIM REPORT, supra note 19, at 76.}
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\textsuperscript{107. P. BARTH, supra note 18, at 137-38 (one or two percent); INTERIM REPORT, supra note 19, at 68 (less than three percent). About one-third of these claims are for minor ailments such as skin rashes.} \textit{Id.}
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\textsuperscript{108. INTERIM REPORT, supra note 19, at 67. See also D. DISCHER, G. KLEINMAN, F. FOSTER, PILOT STUDY FOR DEVELOPMENT OF AN OCCUPATIONAL DISEASE SURVEILLANCE METHOD 44 (1975) (survey of 3,000 workers found 451 with probable occupational disease, only three percent of whom had filed workers' compensation claims).}
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\textsuperscript{109. INTERIM REPORT, supra note 19, at 73-74 (average of $9,700 in compensation compared to expected future earnings of $77,000); accord Hearings on Occupational Diseases—pt. 3, supra note 50, at 83 (statement of Candace Carraway, Carolina Brown Lung Association) (brown lung payments replace small percentage of lost earnings).}
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\textsuperscript{110. The Labor Department's estimates were based on a 1975 study of closed workers' compensation claims and a poll of social security recipients concerning their sources of disability support. INTERIM REPORT, supra note 19, at 67-68, 73-74.}
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\textsuperscript{111. Other sources of relief force little, if any, internalization. Unlike workers' compensation charges, social security payroll taxes are standard across all types of employment, safe or hazardous. Shor, \textit{Workers' Compensation: Subsidies for Occupational Disease}, 1 J. PUB. HEALTH POL. 328, 330 (1980). Pensions, welfare, and private insurance have the same limitation, and welfare and insurance are funded in part by both employees and non-employees.} \textit{Id.}
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\textsuperscript{112. J. MENDELOFF, supra note 64, at 12; Compensating Victims, supra note 14, at 934. Pragmatic}
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the possibility of having to make workers' compensation payments. The structure of that insurance lessens their incentive to take preventive measures because premiums are based primarily on the experience of classes of employers rather than on the safety performance of individual employers.113

Second, any employer liability for employee illness will be less than the social costs of the illness. Workers' compensation payments are controlled by a statutorily prescribed formula which often limits compensation to less than the direct wage losses of disabled employees.114 Further, payments do not cover such items as lost fringe benefits and the intangible costs of pain and suffering and the spouse's loss of consortium.115

Third, there is little internalization because many workers fail to recognize that they have a claim when their illnesses occur long after the hazardous exposure.116 Asbestos insulation workers studied by Dr. Selikoff, for example, filed workers' compensation claims for only thirty-three percent of their asbestos-related disabilities, and their families filed claims for only thirty-six percent of the asbestos-related deaths.117 In the first seven years that brown lung disease (byssinosis) was compensable in North and South Carolina, only 1,000 disabled workers filed claims out of an estimated population of 30,000 disabled workers.118

Fourth, there is little internalization because those workers who do file claims often fail to establish their eligibility for benefits. Some workers fail because there is insufficient information available about their disease to establish that it is work related. The long latency period of many illnesses means that the employee may have had no recent contact with the hazard that caused the disease.119 In such a case, the worker is without persuasive evidence that the illness is work related. Epidemiological data can establish that all workers

managers might favor short-term profits over long-term increases in efficiency, since they would no longer be involved in management when the effects of the decision were felt. Compensating Victims, supra note 14, at 934; cf. McGarity & Schroeder, Risk-Oriented Employment Screening, 59 Tex. L. Rev. 1000, 1016 (1981) (employers "face strong economic pressure to overemphasize short-term profits").

113. INTERIM REPORT, supra note 19, at 76-77. Eighty-five percent of employers, representing 15% of employees, have class-based, rather than experience-based insurance premiums. Roughly 15% of employers, representing 70-75% of workers, have rates based on a combination of their experience and an industry class rate. Id. at 76. Reformers have recommended that experience rating be extended to as many firms as possible, Nat'l Comm'n Report, supra note 103, at 98, but there are serious practical limitations in expanding the use of experience rating. Interagency Task Force on Workplace Safety and Health, Draft Final Report: Making Prevention Pay IV-9, IV-10 (1978) (experience rating impractical for small firms) [hereinafter cited as Making Prevention Pay]; Russell, Safety Incentives in Workers' Compensation Insurance, 9 J. Hum. Resources 361, 372 (1974) (current experience rating procedures offer no incentive for small firms). Further internalization might be accomplished through increasing the level of compensation, or requiring insurance policies to have a deductible and co-insurance feature, or allowing employers to deduct the cost of insurance for federal income tax purposes only up to the average cost of such premiums for their industry. Making Prevention Pay, supra, at IV-11 to -14; Russell, supra, at 373.

114. See infra Appendix I (summarizing workers' compensation laws).

115. N. Ashford, supra note 2, at 350.

116. P. Barth, supra note 18, at 63. Physicians may fail to investigate whether a disease is work related. Id. at 87; Reutter, supra note 2, at 43.

117. I. Selikoff, supra note 79, at 7-8.

118. J. Hughes & E. Scott, Brown Lung Disability: Costs, Compensation and Controversy: An Exploratory Policy Study 3 (June 1979) (Dep't of Labor study).

119. INTERIM REPORT, supra note 19, at 68; P. Barth, supra note 18, at 62-63. Multiple causality and synergistic effects also make establishment of a cause and effect relationship difficult. INTERIM REPORT, supra, at —; P. Barth, supra at 70-77.
exposed to a certain hazard will have a greater probability of contracting a disease than other workers, but this research alone cannot prove that a given worker became ill from contact with the hazardous substance rather than from a non-work-related cause. Worked ignorance is sometimes caused by employers who have withheld information needed to establish claims.

Fifth, workers also fail to obtain compensation because many states have established eligibility requirements that are difficult or impossible to satisfy. While few occupational diseases can be shown to result solely from workplace exposure, thirty-one states limit compensation to diseases that are "peculiar to" or "characteristic of" a worker's occupation. Many illnesses, like cancer, are widespread, but twenty-three states prohibit compensation for "diseases ordinary to life." Eighteen states have recent exposure rules that bar compensation to those workers who were exposed to a hazard more than a specified number of years earlier. Eighteen states have minimum exposure requirements for dust diseases and five states have the same requirement for all diseases. These types of restrictions ignore both the long latency periods associated with many diseases and the lack of knowledge about the relationship between the intensity and duration of exposure and adverse health effects. Realistic statutes of limitation must run from the date of discovery, because of the long latency periods, but twenty state statutes have chosen some point other than discovery.

Sixth, employers, or their insurance companies, litigate most occupational disease claims because the difficulty of proving causation and the existence of restrictive standards for recovery make employer victories in disease cases more likely than in accident cases. A 1980 study found that sixty percent of all such claims and ninety percent of dust disease claims were contested, as compared to only ten percent of accident claims. As a result, most workers making occupational disease claims required legal counsel (whose fees, of course, reduce any award). Further, there was an average of a year's delay between the time a claim was filed and the time an award was made. Finally, about one-half of the litigants found it attractive to settle their cases, often for amounts less than those for which they might have been eligible.

120. P. Barth, supra note 18, at 85; S. Kelman, supra note 50, at 86; Robblee, supra note 16, at 611.
121. See supra text accompanying notes 50 to 52 (numerous instances of employer cover-ups have been revealed).
122. INTERIM REPORT, supra note 19, at 65; P. Barth, supra note 18, at 86-89; Robblee, supra note 16, at 614-24.
123. See infra Appendix I (summarizing workers' compensation laws).
124. See id.
125. Id. Fourteen states have the same type of rule for death benefits. Id.
126. Id.
127. Id. See also N. Ashford, supra note 2, at 413 (relationship of statutes and latency periods). In these twenty states, however, many courts have virtually ignored the wording of the statute and have imposed a date of discovery rule. See infra Appendix I (summarizing workers' compensation laws).
128. INTERIM REPORT, supra note 19, at 69-70. In 73% of all contested cases, the issue litigated was causality. Id. at 70.
129. Seventy-seven percent of occupational disease claimants used lawyers, compared to 24% for accident claims. Id. at 71, 76.
130. Id. at 75. The average delay for accident claims, by comparison, was two months. Id. One reason was that 60% of all disease claimants were initially denied compensation. Id. at 69-70.
131. Id. at 74; REPORT TO THE PRESIDENT AND THE CONGRESS OF THE POLICY GROUP OF THE
Workers' compensation has been no more effective than the tort system it replaced.\textsuperscript{132} For both the numerous accident claims and the relatively fewer disease claims, the system of administering workers' compensation is so costly that an average of forty percent of all taxes paid to support the system are spent for administrative costs, which do not include the lawyer's fees paid by many victims.\textsuperscript{133} Nevertheless, proposals for reform of the workers' compensation system have gone largely unheeded. The 1972 National Commission on Workmen's Compensation, for example, suggested that the system could be improved by eliminating requirements that a disease be "peculiar to or characteristic of" a worker's occupation and that a disease not be "ordinary to life." The Commission also recommended using expert panels to determine scientifically difficult issues of causation, and increasing the maximum allowable benefits for permanent disability to 200\% of the average weekly wage within a state.\textsuperscript{134} A significant number of states have rejected the first recommendation, only seven have adopted the second recommendation,\textsuperscript{135} and only two states have adopted the third recommendation.\textsuperscript{136}

A 1977 Interdepartmental Report for Congress and the President recommended the elimination of both unrealistic statutes of limitation and minimum and recent exposure requirements,\textsuperscript{137} but many states have retained those restrictions.\textsuperscript{138} The 1977 report also suggested that a presumption in favor of workers be adopted. Under this proposal, if epidemiological data established that a hazard caused an occupational disease, the hazard would be presumed to have caused any individual case of the disease in an exposed worker. The burden of proof would then shift to the employer to establish that the disease was not work related.\textsuperscript{139} Only seven states have adopted this reform.\textsuperscript{140}

A 1980 Labor Department Report to Congress recommended that the states finance workers' compensation by imposing on all employers an equal tax to be paid into a trust fund.\textsuperscript{141} As an alternative, the 1980 Report recommended that a program for the payment of occupational disease benefits be built into the Social Security system or that present eligibility requirements for disability and death payments be broadened to compensate additional workers.\textsuperscript{142} The Report proposed as a final alternative that Congress create compensation programs for specific diseases.\textsuperscript{143} None of these recommendations has been adopted.

Opponents of the recommended reforms have argued that the proposed

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  \item \textsuperscript{132} See Kutches, The Most Exclusive Remedy Is No Remedy at All: Workers' Compensation Coverage for Occupational Diseases, 32 LABOR L.J. 212, 218 (1981) (discussing criticisms of tort system).
  \item \textsuperscript{133} INTERIM REPORT, supra note 19, at 76.
  \item \textsuperscript{134} NAT'L COMM'N REPORT, supra note 19, at 50-51, 64-65.
  \item \textsuperscript{135} See infra Appendix I (summarizing workers' compensation laws).
  \item \textsuperscript{136} See id.
  \item \textsuperscript{137} INTERDEPARTMENTAL TASK FORCE, supra note 131, at 38.
  \item \textsuperscript{138} See supra notes 125 to 127 and accompanying text (discussing state restrictions on availability of workers' compensation).
  \item \textsuperscript{139} INTERDEPARTMENTAL TASK FORCE, supra note 131, at 35-36.
  \item \textsuperscript{140} See infra Appendix I.
  \item \textsuperscript{141} INTERIM REPORT, supra note 19, at 99.
  \item \textsuperscript{142} Id. at 101-02.
  \item \textsuperscript{143} Id. at 102-04.
\end{itemize}
changes would lessen the ability of the workers' compensation system to weed out claimants who have non-work-related diseases.\textsuperscript{144} The existing system, however, has a very heavyhanded method of accomplishing that result. Many of the tests used to exclude ineligible workers were created to regulate claims for industrial accidents and, consequently, work poorly when applied to the entirely different problem of claims for occupational diseases.

Reform that merely eliminated these arbitrary standards for compensation would not be sufficient, however. The inadequacy of the information available about occupational disease must also be considered. The principal reform that addresses the information problem is the suggestion that a presumption about causation be adopted.

Proponents of such a presumption argue that it is fair to place the burden of showing that a claim is not work related on employers because employers have better access to relevant information about individual cases than do employees.\textsuperscript{145} In some instances, however, causation will be as difficult for employers to dispute as it is for workers to establish.\textsuperscript{146} Moreover, experience with the black lung compensation program indicates that choosing the evidentiary standards that will trigger a presumption can be a difficult problem.\textsuperscript{147} If presumptions are justifiable, it must be on the basis that "a rough justice over large samples of employees" is achieved.\textsuperscript{148} Whether in fact the number of deserving workers who would not receive compensation but for a presumption exceeds the number of undeserving workers who would receive compensation because of a presumption is probably an unanswerable question. In cases in which there is persuasive epidemiological evidence that a disease is work related, it is rational to assume that a presumption will not be unjust when applied to a large number of workers. A presumption, therefore, may be justifiable in some cases, but it is not a panacea.\textsuperscript{149} The elimination of unreasonable standards is also necessary, since even if a presumption were adopted, many workers' claims would still be subject to case-by-case adjudication.

Expansion of Social Security or any other compensation program using trust-fund financing that is not based on employers' safety records may reduce the incentive of employers to prevent occupational disease.\textsuperscript{150} Proponents of the idea of expanding Social Security argue that a surcharge could be assigned against companies with bad records,\textsuperscript{151} but the administration of such a tax would be difficult as a practical matter. Proponents also assert that necessary

\begin{thebibliography}
\bibitem{144} See Reutter,\textit{ supra} note 2, at 43 (criticizing proposed reforms).
\bibitem{145} \textit{INTERDEPARTMENTAL TASK FORCE, supra} note 131, at 36.
\bibitem{146} This problem is highlighted by the actions of the textile industry, which has taken out newspaper advertisements trying to "pin the blame" for brown lung disability on the tobacco industry. Shor,\textit{ supra} note 111, at 336.
\bibitem{147} See Solomons,\textit{ A Critical Analysis of the Legislative History Surrounding the Black Lung Interim Presumption and a Survey of Its Unresolved Issues, 83 W. VA. L. REV. 869, 898 (1981) (contrasting different evidentiary thresholds for Department of Labor and Social Security Administration presumptions); Compensating Victims, supra} note 2, at 931-32 (discussing problem of establishing threshold for presumption that disease is occupationally related).
\bibitem{148} Compensating Victims,\textit{ supra} note 2, at 931.
\bibitem{149} Id. at 933.
\bibitem{150} See supra} text accompanying notes 103 to 106 (discussing incentive of employers to prevent occupational disease under current system).
\bibitem{151} Reutter,\textit{ supra} note 2, at 44.
\end{thebibliography}
preventive efforts could be ordered by OSHA. However, an investigation of OSHA's effectiveness, which follows, shows that agency action to prevent occupational disease has been exceedingly slow and cumbersome.

The future of reform appears bleak. The present system produces inadequate internalization of the costs of occupational illnesses, yet many of the proposed reforms would be even less effective. Elimination of restrictive standards and the creation of a causal presumption would be desirable improvements, but legislative action is required in many states. The standards for workers' compensation could be federalized, but congressional action is stymied by the same interest groups that have slowed state reform.

Opponents of reform represent an impressive political force. Typically, the insurance industry, workers' compensation lawyers, and employers have combined to oppose reform efforts. Support for such efforts has come from labor unions, workers' compensation administrators, and judges who dislike the responsibility of interpreting standards that produce harsh results. The limited reform that has occurred has usually been adopted with the agreement of opponents, who compromised to prevent more drastic changes.

The Tort System. As a result of the ineffectiveness and inefficiency of the workers' compensation system, workers who suffer from occupational diseases have attempted to bring common law tort actions. Workers who are successful in these actions can recover all of their economic losses, plus compensation for pain and suffering and punitive damages, both of which are unavailable under workers' compensation. Companies that are responsible for causing occupational illnesses will, in theory, be made to bear the full cost of those illnesses. Thus, they should undertake remedial efforts until the cost of those efforts is greater than the cost of defending tort suits and paying the resulting settlements or judgments. The actual outcome, however, is quite different.

Few workers disabled by occupational disease receive a full measure of compensation under tort remedies. Just as with workers' compensation claims, ignorance about the causal relationship between workplace exposure and latent illness keeps many workers from filing suit. For instance, the Selikoff study found that only sixteen percent of eligible survivors filed third-party tort suits for the asbestos-related deaths of their relatives. Those who do file suit rarely recover all of their economic losses. The Selikoff study found that most

152. INTERIM REPORT, supra note 19, at 99.
153. See infra text accompanying notes 208 to 281 (OSHA has produced only a few new rules to protect workers from occupational disease).
155. Korioth, The Forces That Produce Changes in The Workmen's Compensation Laws of Texas and Louisiana, in 3 SUPPLEMENTAL STUDIES FOR THE NAT'L COMM'N ON STATE WORKMEN'S COMPENSA-
LAWS 517 (1973) [hereinafter cited as SUPPLEMENTAL STUDIES]; Skelton, Workmen's Compensation in Oregon, in SUPPLEMENTAL STUDIES, id., at 526; Motley, A Study of the Forces That Produce Changes in the Workmen's Compensation Laws of Four States: Maryland, Pennsylvania, Virginia, West Virginia, in SUPPLEMENTAL STUDIES, id. at 544.
156. I. SELIKOFF, supra note 77, at 10.
tort suits filed were settled for slightly more than half of the wage loss. There are five reasons for this result.

One important obstacle to tort recovery is that the employer, who may be the most culpable party, is normally immune from the suit under the exclusive remedy provisions of workers’ compensation. Innovative plaintiffs have made some inroads into the exclusivity rule, but most jurisdictions have not created exceptions of any significance. Therefore, injured workers must find some third party, such as a supplier or manufacturer of raw materials, who may be at least partially responsible for the injury. In most states, a third-party manufacturer or supplier who is held liable to the plaintiff cannot seek contribution from the employer, even though the employer may also have

157. Id. at 11 (average settlement of $72,000, as compared to an average total after-tax wage loss of $127,151).
160. Many state workers’ compensation laws exclude from coverage an intentional injury committed by an employer or one of its employees, and, thus, a common law suit may be maintained for those injuries. See generally 2A. Larson, WORKMEN’S COMPENSATION LAW §§ 68.00-.13 (1982). Generally, courts require proof of specific intent to injure the employee; therefore, tort suits alleging only willful, wanton, and reckless exposure of employees to a workplace risk may not be maintained. See Johnson v. Kerr-McGee Oil Industries, 129 Ariz. 393, 397-98, 631 P.2d 548, 552-53 (Ariz. Ct. App.), appeal dismissed, 454 U.S. 1055 (1981) (lung cancer caused by exposure to uranium; “intentional failure to warn” insufficient); Great Western Sugar Co. v. Dist. Court, 610 P.2d 717, 720 (Mont. 1980) (wanton or malicious negligence insufficient to oust case from workers’ compensation statute; intentional tort required). A few courts have, however, relaxed the requirement of intent. For example, Blankenship v. Cincinnati Milacron Chem., Inc., 69 Ohio St. 2d 608, 613, 433 N.E.2d 572, 576 (1982), held that a tort suit against an employer by employees injured by exposure to toxic chemicals stated a cause of action because plaintiffs alleged a knowing failure to correct conditions or warn of the danger. Similarly, Johns-Manville Prod. Corp. v. Contra Costa Superior Court, 27 Cal. 2d 465, 477, 612 P.2d 948, 955, 165 Cal. Rptr. 858, 865 (1980), held that an employee’s claim for his initial injuries caused by exposure to asbestos was barred, but the employee was allowed to seek damages for aggravation of the original injury on the ground that his employer fraudulently concealed from him the asbestos-related nature of his ailment. See also Mandolides v. Elkin Indus., 246 S.E.2d 907, 914 (W. Va. 1978) (exclusivity of workers’ compensation defeated where employer’s conduct constitutes intentional tort or willful, wanton, and reckless misconduct).

An employee may also maintain a common law action against the employer under the dual capacity doctrine if the employer has assumed a capacity other than that of employer. See Duprey v. Shane, 39 Cal. 2d 781, 793, 249 P.2d 8, 15 (1952) (nurse can sue employer physician in malpractice because physician gave nurse medical treatment for a work-related injury). The California Supreme Court embraced the dual capacity doctrine to allow tort suits against the employer when an employee is injured by a product manufactured by the employer, Bell v. Indus. Vangas, Inc., 30 Cal. 2d 268, 282-83, 637 P.2d 266, 275, 179 Cal. Rptr. 30, 39 (1981) (employee injured while delivering flammable gas to his employer’s customer), but the California legislature subsequently enacted a statute weakening the effect of Bell. Act of Sept. 10, 1982, ch. 922, amending Labor Code sec. 3602, 1982 Cal. Legis. Serv. 4949 (West). Ohio, by comparison, continues to allow product liability suits by an employee against an employer. Mercer v. Uniroyal, Inc., 49 Ohio App. 2d 279, 286, 3671 N.E.2d 492, 496 (1977) (Uniroyal employee injured when Uniroyal tire on truck in which he was riding blew out). Other courts have held that the dual capacity doctrine is inapplicable in a limited employer/manufacturer context. See Mapson v. Montgomery White Trucks, Inc., 357 So. 2d 971 (Ala. 1978) (worker injured while repairing truck sold to third party; no dual capacity found); Longever v. Revere Copper & Brass, Inc., 381 Mass. 221, 224, 408 N.E.2d 857, 859 (1980) (employer who manufactures and provides tools to employee for use in employment does not act in dual capacity).
been at fault.\(^{161}\) Moreover, in all but three states the payor of workers’ compensation benefits gains subrogation rights in the employee’s third-party suit and will be reimbursed by any tort recovery the employee receives.\(^{162}\) The existence of these subrogation rights can further reduce the incentive of the employer to eliminate workplace hazards and can impose costs on the third party which are disproportionate to its responsibility.

Statutes of limitation present a second obstacle to recovery. Although most tort statutes of limitation begin to run from the time the cause of action “accrues,”\(^{163}\) jurisdictions differ about when that moment occurs. Several states follow a “last exposure rule,” under which the cause of action accrues on the date of the last exposure to the harmful substance.\(^{164}\) Another approach is that the claim accrues when the damage is capable of ascertainment.\(^{165}\) The vast majority of jurisdictions adhere to some form of a third rule, the discovery rule, but there are various formulations as to when “discovery” occurs. The most common approach is that the statute begins to run when the plaintiff knew or reasonably should have known of the injury.\(^{166}\) Another formulation is that the statute starts to run when the plaintiff knew or should have known that the injury existed and that it was probably caused by the conduct of the defendant.\(^{167}\) Still another formulation is that the cause of action accrues when the disease actually manifests itself.\(^{168}\)

\(^{161}\) The theory barring contribution is that since liability of the employer under the workers’ compensation system is imposed on a no-fault basis, by definition the employer cannot be a tortfeasor subject to claims for contribution. State ex rel. Maryland Heights Concrete Contractors, Inc. v. Ferriss, 588 S.W.2d 489, 490-91 (Mo. 1979). See generally 2A A. Larson, supra note 160, at §§ 76.00-39. In a few states, the defendant may assert the employer’s fault as a defense to the worker’s claim, but only to the extent of any workers’ compensation benefits paid. Witt v. Jackson, 57 Cal. 2d 57, 73, 366 P.2d 641, 649, 17 Cal. Rptr. 369, 377 (1961). Many states have adopted a system of comparative fault, so that the degree of fault of all persons involved in an incident, including the immune employer, may be determined. Most of those states, however, still follow the rule of joint and several liability. Plaintiff may recover the entire verdict, including the percentage, if any, attributable to the employer, against any defendant, with that defendant left to seek contribution according to degrees of fault from the other wrongdoers, except from the protected employer. Mulder v. Acme-Cleveland Corp., 95 Wis. 2d 173, 178-79, 290 N.W.2d 276, 278-79 (1980). But see Brown v. Keill, 224 Kan. 195, 204, 580 P.2d 867, 874 (1978) (under Kansas law, each party at fault is responsible only for its assessed percentage of fault; no joint and several liability or contribution). The defendant may, however, have a right to indemnification from the employer in some circumstances. 2A A. Larson, supra note 160, at sections 76.40-84. Cf. Lockheed Aircraft Corp. v. United States, 103 S. Ct. 1033, 1038 (1983) (exclusive remedy provision of Federal Employees’ Compensation Act does not preclude tort defendant’s suit for indemnification against United States as employer).

\(^{162}\) See generally 2A A. Larson, supra note 160, at §§ 74.00-42.


\(^{166}\) For examples, see Hansen v. A.H. Robins Co., 113 Wis. 2d 550, 560, 335 N.W.2d 578, 583 (1983); Perez v. Universal Engineering Corp., 413 So.2d 75, 77-78 (Fla. 1982).


\(^{168}\) Clutter v. Johns-Manville Sales Corp., 646 F.2d 1151, 1158 (6th Cir. 1981) (applying Ohio law)
These variations in statute of limitation rules create great confusion, and the position a particular court will take is not always predictable. Further, even when a decision has been made, the court's formulation of its rule may not always be clear and capable of easy application to later cases. This legal uncertainty, coupled with the necessary factual determinations, requires extensive threshold litigation which can encourage defendants to resist claims and can deter plaintiffs from pursuing them.

The third obstacle is that many plaintiffs cannot meet the burden of proof assigned to them. Occupational disease claims generally proceed on a theory of strict liability, although claims of negligence and breach of warranty may be asserted as well. Most strict liability claims assert a duty to warn of hazards associated with the product. Since the disease-causing nature of most chemicals and dusts is inherent, these products are typically "unavoidably unsafe," and any manufacturer's liability results not from the dangers inherent in the products, but from the failure to give adequate warnings of those dangers.

In most jurisdictions, manufacturers are required to warn only of reasonably foreseeable risks. Even though a defendant is held to the standard of an expert in its field, plaintiffs may not be able to show that knowledge of the risks was reasonably available at the time of manufacture, many years before the illness. Recently, however, a few courts have rejected this "state of the art" defense and have held that defendants could be liable for failure to warn of dangers that were undiscoverable at the time of manufacture. These decisions remove one of the major obstacles to a successful suit because most reported toxic substance cases have involved products for which no warning was given.

(claims for insidious diseases caused by exposure to asbestos accrue under Ohio law when disease manifests itself); Karjala v. Johns-Manville Prods. Corp., 523 F.2d 155, 160 (8th Cir. 1975) (applying Minnesota law) (statute of limitations tolls when harm manifests itself which can be shown to be caused by act or omission for which defendant would be liable). 169. For a compilation of the various state rules, see McGovern, The Status of Statutes of Limitation and Statutes of Repose in Product Liability Actions: Present and Future, 16 FORUM 416, 444-50 (1981).

170. See Renfroe v. Eli Lilly Co., 686 F.2d 642 (8th Cir. 1982) (suit filed in 1978; decision on some of the statute of limitation issues in 1982). This case also involved complex choice-of-law issues, which may be present in disease cases if workers have been exposed to the hazard in more than one state. Id. at 649-50.

171. The discussion in the text will deal only with strict liability, because it is the easiest theory to prove. A plaintiff who can make out a case of negligence or breach of warranty will also prevail on strict liability.


175. State of the art is often referred to as a defense. See Beshada v. Johns-Manville Prods. Corp., 90 N.J. 191, 200, 447 A.2d 539, 546 (1982) (defendants using state of the art defense assert that because they could not have known product was dangerous, they acted reasonably in marketing it without warning). Technically, however, it may be more proper to include its negation as part of plaintiff's case. To recover on a theory of failure to warn, plaintiff must show that defendant knew or should have known of the danger. See generally J. BEASLEY, PRODUCTS LIABILITY AND THE UNREASONABLY DANGEROUS REQUIREMENT 393-410 (1981).


177. If a warning was given with a product, a plaintiff can still prevail by showing its inadequacy.
A fourth obstacle to tort suits is that plaintiffs may have no idea who manufactured the toxic substances to which they were exposed. In fact, workers often do not even know the names of the chemicals in the workplace, much less their manufacturer. In a suit involving the drug DES, the California Supreme Court adopted the concept of market share liability, which shifts the burden of proof on the issue of identification from plaintiffs to defendants and subjects defendants to liability in proportion to their market share unless they can show they did not manufacture the product that harmed the plaintiff. Widespread adoption of this legal theory would be helpful to workers but would also be enormously expensive and slow since it can only occur on a state-by-state and product-by-product basis.

Delay, the fifth obstacle, is perhaps the biggest problem faced by workers who wish to bring third-party tort suits. Defendants have a strong incentive to fight toxic substance suits, and vigorous and protracted defenses can be mounted because of the uncertainty of the law. For instance, the Chapter 11 bankruptcy filing of the Manville Corporation showed that the company had spent $24.5 million in legal fees defending tort claims of asbestos victims, as compared to payments of $24 million to claimants. Plaintiffs who need money desperately because of the death or disability of the principal wage earner in the family are often induced to accept relatively low settlements rather than litigate for years.

In spite of these obstacles, the number of tort suits appears to be growing, probably in large part because of the prospect, however slim, of a recovery greater than the meager amounts paid under workers' compensation. One important reaction to this increased litigation has been the Chapter 11 reorganization petitions filed by three currently healthy corporations, chief among

See J. Beasley, supra note 175, at 421. Defendants, on the other hand, may be able to avoid liability by proving that adequate warnings placed on the product were removed or not passed on by the employer or some other intermediary. Id. at 432. Under some circumstances, however, a manufacturer may be required to convey warnings directly to the ultimate user, even though an intermediary may deal with the user as well. See Jackson v. Coast Paint & Lacquer Co., 499 F.2d 809, 814 (9th Cir. 1974) (applying Montana law) (duty to warn runs directly to user and is not discharged by informing employer alone).

Under the sophisticated user defense, a manufacturer is relieved of its duty to warn if it is reasonable for it to rely on an intermediary to warn the ultimate user. RESTATEMENT (SECOND) OF TORTS § 388 comment n (1965). Thus a manufacturer may avoid liability to a worker injured by its product if it can show that the worker's employer knew or should have known of the danger associated with the product and that it was more reasonable for the employer to give the warning. Lockett v. General Elec. Co., 376 F. Supp. 1201, 1212 (E.D. Pa. 1974), aff'd, 511 F.2d 1394 (3d Cir. 1975); Dougherty v. Hooker Chem. Corp., 540 F.2d 174, 179 (2d Cir. 1976); Marshall v. H.K. Ferguson Co., 623 F.2d 882, 886-87 (4th Cir. 1980). Successful assertion of either of these defenses may leave the plaintiff with no recovery, since the employer is protected by the exclusive remedy provisions of workers' compensation, no matter how negligent it may have been.

See infra text accompanying notes 282 to 327 (discussing state and federal hazard communication rules).

178. See supra note 157 (comparing settlements in asbestos disability suits with economic losses).


180. Most product liability doctrine is governed by common law, which is generally more ambiguous than statutory law. S. REP. No. 670, 97th Cong., 2d Sess. 3-8 (1982).


182. See supra note 157 (comparing settlements in asbestos disability suits with economic losses).

183. I. Seikoff, supra note 77, at 538-41.
them the Manville Corporation.184 Attacked as “fraudulent”185 and a “perversion”186 of the bankruptcy laws, these filings seek to have current and future liabilities187 to asbestos claimants consolidated and discharged. The petitions may ultimately be dismissed as filed in bad faith,188 or the bankruptcy courts may decide they lack the authority to terminate the claims of future plaintiffs. In the meantime, however, asbestos litigation against other co-defendants has proceeded.189 These companies, all smaller than Manville, must now bear the entire burden of defense in pending and future litigation, and in states which impose joint and several liability they must pay the entire amount of any judgments.

In spite of the many procedural and substantive barriers to successful tort suits, manufacturers have sought legislative action to overrule legal decisions favorable to plaintiffs. For example, although statutes of limitation have been interpreted to bar many latent disease claims, legislation proposing even more restrictive statutes of limitation has been introduced.190 Manufacturers of capital goods may have legitimate grounds for seeking relief,191 but legislative action has not been restricted to cases involving such items. More than twenty states have enacted statutes of repose for product liability actions, many of which are not by their terms limited to cases involving capital goods.192 Should these statutes be applied to occupational disease claims, workers could find their actions completely barred.193

By comparison, the proposed federal Products Liability Act would establish a twenty-five-year statute of repose for claims involving capital goods,194 but this limitation would not apply if the harm was caused by the cumulative effect

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185 Granelli, Manville Bankruptcy: The Battle is Beginning, Nat'l J., Sept. 6, 1982, at 5, col. 2.
187 Manville claims to be a defendant in 16,500 asbestos-related lawsuits, with a potential of from 30,000 to 120,000 future suits. Wall St. J., Aug. 27, 1982, at 29, col. 1. UNR stated that it has 17,000 claims pending against it, Richards, UNR Losses Bid to Help Define Asbestos Claims, Wall St. J., Mar. 29, 1983, at 2, col. 2, with 500 new suits a week, Richards, UNR Case May Set Legal History With Efforts to Limit Asbestos Suits, Wall St. J., Mar. 16, 1983, at 33, col. 4. Amatex alleges it is a defendant in 10,000 pending suits, with new claims being filed at the rate of 300 per month. Third Maker of Asbestos Products Seeks Bankruptcy Shelter from Liability Claims, 12 O.S.H. Rep. (BNA) 442 (Nov. 4, 1982).
192 See Utah Code Ann. § 78-25-3 (“No action shall be brought for the recovery of damages for personal injury or death . . . ten years after the date of manufacture of a product, where that action is based upon . . . [failure to warn].”)
of prolonged exposure to the defective product or if the harm did not manifest itself until after the limitation period had run. The federal proposal would assign the burden of proving that the manufacturer was negligent to plaintiffs alleging design defects or a failure to warn. The manufacturer could discharge the duty to warn by giving the warning to an employer or to the manufacturer's immediate buyer, if there was no "practical, feasible" way to give warnings directly to the plaintiff. Further, manufacturers would not be liable if they could prove by a preponderance of the evidence that an injury was caused by the product user's failure to provide for the safe use of the product. Similarly, a manufacturer would not be liable if someone other than the manufacturer made unauthorized modifications to the product or failed to perform routine care and maintenance.

In addition to federal product liability reform, efforts are being made at the federal level to remove asbestos claims from the courts entirely. The proposed Occupational Disease Compensation Act would limit workers' actions for asbestos-related illnesses to claims for lost wages and medical expenses from a federal compensation fund, although a worker whose claim was not resolved within eighteen months of filing could commence tort litigation. Although currently limited to asbestos, this bill would establish a trigger mechanism to bring other substances within its coverage if the Secretaries of Labor and Health and Human Services so determined. Passage of the bill is unlikely, however, because of disagreements concerning the sources of funding for the compensation fund and the extent to which tort suits would be limited.

2. Preventive Regulation

The 1970 Occupational Safety and Health Act was adopted because Congress recognized that workers were insufficiently protected from accidents and health hazards. To set an agenda for action, Congress established the National Institute for Occupational Safety and Health (NIOSH), now located in the Department of Health and Human Services, and required that it develop
recommendations, called criteria documents, for exposure limits for toxic materials. Congress also established OSHA, an agency within the Labor Department, to regulate health and safety in the workplace. To protect workers while toxic exposure regulations, called standards, were being developed, Congress required that OSHA adopt and enforce voluntary industry health codes, or national consensus standards, which included some 400 exposure ceilings for toxic substances set by the American Conference of Governmental Industrial Hygienists.

From 1972 through 1980, NIOSH recommended that the national consensus standards for 109 toxic substances be amended. In addition, NIOSH and OSHA, in jointly reviewing the consensus standards, agreed that changes should be considered for about 123 substances. OSHA has been unable to cope with this deluge of proposals. By the end of 1980, OSHA had completed rulemaking proceedings for only twenty-three substances. Standards for asbestos, vinyl chloride, coke oven emissions, and fourteen carcinogens were completed from 1972 through 1976. Standards for benzene, inorganic arsenic, cotton fiber and cotton gin dust, acrylonitrile, and lead were all promulgated in 1978.

Early OSHA efforts to promulgate new standards were snarled by bureaucratic ineptitude and poor leadership. The Carter administration attempted to improve OSHA’s performance but failed because the decisions being made were vigorously contested by both labor and industry. OSHA rulemaking procedures, which require twenty-two separate steps, proved to be unwieldy when controversial issues had to be resolved. Two standards (coke oven emissions and lead) took more than six years from recommendation to the agency that action be taken to promulgation of a final rule. Three other standards (inorganic arsenic, cotton fiber, and cotton gin dust) took three to four years. Judicial review has further delayed the implementation of OSHA standards by

212. Id.
213. J. Mendeloff, supra note 64, at 58.
215. EMPL. SAFETY & HEALTH GUIDE (CCH) ¶ 8783 (15 substances), ¶ 9658 (8 substances), ¶ 9728 (15 substances), ¶ 9814 (6 substances), ¶ 9902 (11 substances), ¶ 10,042 (11 substances), ¶ 10,082 (18 substances), ¶ 10,097 (22 substances) (1975). Id. at ¶ 10,317 (17 substances) (1976).
216. See infra Appendix II (summarizing time required for agency rulemaking).
217. Id.
218. Id.
220. One observer has noted that “OSHA, almost from its inception, has been the target of public criticism and private conspiracy typically reserved for the mad or illegitimate progeny of royalty.” Perry, Safe and Healthful Working Conditions: The Case of Vinyl Chloride, in INDUSTRIAL RELATIONS RESEARCH ASSOC., PROCEEDINGS OF THE 32ND ANNUAL MEETING 363 (1980).
221. R. Smith, supra note 71, at 75. See S. Kelman, supra note 50, at 10-13 (description of rulemaking procedures).
222. See infra Appendix II (summarizing time required for agency rulemaking).
223. Id.
an average of two years. The combination of agency and judicial delay has often been extreme. Five important standards took six to eight and one-half years from the original recommendation that the agency act until the completion of judicial review.

OSHA decisions have been vigorously contested for two reasons. The first reason is that present knowledge offers no clear guidance concerning the degree of danger posed by a substance, since information needed to reach an informed decision is unavailable. The second reason is that once an estimate of danger is derived, there is considerable disagreement concerning what action should be taken because those involved in the process hold different values by which they evaluate what steps might be appropriate. To understand the effect of these influences, the nature of OSHA decisionmaking and the standards under which it occurs must be considered.

OSHA is required to set a standard for exposure “which most adequately assures, to the extent feasible, . . . that no employee will suffer a material impairment of health or functional capacity if such employee has regular exposure to the hazard . . . for the period of his working life.” To satisfy this requirement, OSHA must conduct a risk analysis that determines whether a substance is toxic and whether there is some safe level of exposure for the substance. Then the agency must determine whether the safe level of exposure can be “feasibly” obtained.

Determinations of toxicity ideally would be based on animal experimentation confirmed by epidemiological data, but the necessary epidemiological information seldom exists. OSHA therefore decided to promulgate standards on the basis of appropriate animal experimentation as sufficient evidence of toxicity, although there was considerable disagreement in the scientific community about the reliability of such evidence. Animal experimentation can be used to test the relationships between levels of exposure and the degree of harm, termed a dose-response curve, but the extrapolation of those results to determine the effect of exposure on humans is unreliable for the reasons previously examined. Available epidemiological data usually contain no evi-

224. Id. The two rules for which judicial review was not sought, which regulated DBCP and Acrylonitrile, were finished in far shorter time than those rules for which review was sought. Those two rules took an average of 12 months from the time OSHA was requested to act until it acted as compared to an average of almost 50 months for the other rulemaking proceedings for which judicial review was sought. See infra Appendix II.

225. Id. (Coke Oven Emissions, Cotton Fiber and Cotton Gin Dust, Inorganic Arsenic, and Lead).

226. See Morgan, Bad Science and Good Policy Analysis, 201 SCIENCE 971 (1978) (distinction between scientific decisions, which require adequate information, and policy decisions).

227. OSHA was ultimately influenced by “pro-protective values” which arose from the ideology of the safety and health officials who guided the agency. S. Kelman, supra note 50, at 82. Business was guided by contradictory “economic values.” Id.


229. Id.

230. Id.

231. See supra text accompanying notes 11 to 45 (discussing limitations of epidemiological studies).


233. See supra text accompanying notes 6 to 7 (questioning reliability of animal studies).

234. Id.
dence about dose-relationships. OSHA therefore decided that if a safe level of exposure could not be reliably calculated from available data, the only action it could take to meet its mandate was to order the lowest exposure level that was "feasible." OSHA's critics contended that such an "extreme" safety policy was an overreaction.

The controversy concerning OSHA's decision to seek the lowest feasible level of exposure was significantly increased by the agency's unwillingness to balance costs against benefits in its determination of feasibility. OSHA believed its mission was to seek the greatest protection that could be achieved technologically unless the financial viability of an entire industry would be threatened. The agency chose to implement its standards primarily through expensive engineering controls, such as ventilation systems, instead of the much less expensive personal protective devices, such as respirators. The difference in costs between the two approaches was so considerable that OSHA was forced to delay implementation of the engineering controls as a compromise with industry, although it refused to eliminate their eventual requirement.

The scientific bases of the first three OSHA standards were challenged on the ground that the agency lacked the statutorily required "substantial evidence" because inadequate information was available to establish toxicity or dose-response. In Synthetic Organic Chemical Manufacturers Association v. OSHA, the court held that OSHA was required to balance costs against benefits in its determination of feasibility. OSHA had failed to do so in its decision to enforce the lead standard.


For OSHA, the problem is that because an adequate dose-response curve may not be available, supra notes 234 to 235, estimation of the number of deaths and illnesses that will be avoided can involve considerable error. M. Green and N. Waitzman, Business War on the Law 49 (rev. 2d ed. 1981). Moreover, society may wish to serve such nonutilitarian objectives as redistribution of wealth or the allocation of resources on the basis of "individual rights." MacCarthy, A Review of Some Normative and Conceptual Issues in Occupational Safety and Health, 9 B.C. Env. Aff. L. Rev. 773, 782-90 (1981). Congress has enacted many regulatory programs to serve such purposes, G. Stigler, The Economist as Preacher and Other Essays 10 (1982), and OSHA is apparently one of these. See infra text accompanying notes 266 to 269 (discussing Supreme Court's interpretation of congressional purpose in enacting OSHA).
Brennan, the Third Circuit rejected the argument that OSHA could not determine carcinogenicity on the basis of animal data alone. The court viewed the question of the validity of OSHA's reliance on expert scientific opinion that animal test data was sufficient as a "legal rather than a factual determination" which required a scope of review different from "substantial evidence." The court believed its role was to determine whether OSHA's decision was "consistent" with the "statutory language and purposes" of the Act. Since OSHA's determination was "in the nature of a recommendation for prudent legislative action," the Court believed the decision was consistent with the statutory requirement that OSHA seek the greatest protection of workers that is feasible. In Society of Plastics Industry v. OSHA and American Iron and Steel Inst. v. OSHA the Second and Third Circuits similarly rejected the argument that OSHA's adoption of the lowest exposure level feasible standard was not supportable when no dose-response curve could be calculated. The Plastics Industry court regarded OSHA's decision to seek minimal exposures as a policy judgment to be affirmed as long as it was not arbitrary or capricious. In light of scientific opinion that no safe exposure level was known, the court concluded that OSHA's decision reasonably served the protective nature of the Act. The American Iron court concluded that expert opinion that no safe level of exposure was known constituted the "substantial evidence" required by the Act.

In Industrial Union Department v. American Petroleum Institute, the Supreme Court held that Congress had not delegated to OSHA the authority to decide how to proceed if sufficient information about safety was not available. A plurality of the Court held that Congress had allowed OSHA to promulgate a regulation requiring an exposure level lower than the consensus standard only if the agency first had proven that the change was "necessary and appropriate to remedy a significant risk of material health impairment." For the benzene standard under review, three members of the plurality found

243. 503 F.2d at 1157; 506 F.2d at 387.
245. 503 F.2d at 1159-60.
246. 509 F.2d 1301 (2d Cir. 1975).
247. 577 F.2d 825 (3d Cir. 1978).
248. 509 F.2d at 1308; 577 F.2d at 827-28, 832.
249. 509 F.2d at 1304.
250. Id. at 1308.
251. 577 F.2d at 831-32. OSHA relied on, in part, the Surgeon General's Report, supra note 244. Id. at 832.
253. See id. at 652-53 (Act authorizes OSHA to promulgate health and safety standards only when agency can show, on the basis of substantial evidence, that significant risk of harm exists).
254. Id. at 659-40. The plurality located this requirement in 29 U.S.C. § 652(8) (1976), which defined an occupational safety and health standard as a "standard which requires . . . the adoption of one or more practices . . . reasonably necessary or appropriate to provide safe or healthful employment . . . ." The plurality rejected OSHA's assertion that this provision required only that regulations be rationally related to the purpose of achieving a healthier work environment on the basis of their read-
that OSHA had made no attempt to meet this burden of proof since the agency had not quantified the risk presented to workers by the existing consensus standard.255 The three Justices rejected OSHA’s determination that since expert scientific opinion demonstrated that no dose-response curve could be calculated, the only prudent course was to seek the lowest exposure level that was feasible.256 The fourth member of the plurality, Justice Powell, said that he was willing to accept expert scientific opinion as proof of “significant risk” if OSHA had first proven that quantitative evidence was unavailable, but that OSHA had failed to meet that burden of proof in this case.257

Since a majority of the Court apparently now subscribes to the view that OSHA is required to prove that a significant risk is posed by existing levels of exposure,258 the only question left open is whether a majority also believes that OSHA must meet that burden with quantifiable evidence.259 OSHA’s ability to promulgate standards would be significantly curtailed by such a requirement, since for many hazards quantifiable evidence is not presently available.260

Even if the Court accepts Justice Powell’s position that quantifiable evidence is not necessarily required, the benzene decision will still have the effect of slowing OSHA’s efforts. Prior to the decision, OSHA had adopted a generic cancer policy to avoid having to resolve the same scientific issues in every rulemaking proceeding.261 The centerpiece of the policy was a decision to seek the lowest exposure feasible for any chemical that was carcinogenic in either animals or humans and to limit participants in a rulemaking proceeding to presenting certain types of evidence in their attempts to convince OSHA it should not follow its generic policy.262 After the Court’s decision in the ben-

ing of other relevant statutory provisions, the legislative history, and the requirements of the nondelegation doctrine. 448 U.S. at 640-46.

255. 448 U.S. at 652-53.
256. Id. at 631-32, 635 n.38.
257. Id. at 667.


259. See 448 U.S. at 690-91 (Marshall, J., dissenting) (majority of justices reject view that magnitude of health risk must be quantifiable).

260. Justice Marshall wrote in his dissenting opinion in the benzene case that “the existing evidence may frequently be inadequate to enable [OSHA] to make the threshold finding of ‘significance’... . If so, the plurality’s approach would be to subject American workers to a continuing risk of cancer and other fatal diseases, and to render the Federal Government powerless to take protective action on their behalf.” Id. at 690 (Marshall, J., dissenting). The plurality opinion answered that OSHA was not required to prove significant risk “with anything approaching scientific certainty,” id. at 656, and it gave some examples of the type of evidence that would be acceptable. For example, the plurality cited OSHA’s use of animal test data in other proceedings. Id. at 657 n.64; see supra text accompanying notes 241 to 245 (discussing case which upheld OSHA’s determination of carcinogenicity on the basis of animal data). The plurality opinion gave no indication that those results were subject to considerable error, see supra text accompanying notes 6 to 10 (discussing unavailability of information about toxicity of occupational chemicals), or that the error might be within the margin of deviance that would be unacceptable. See Latin, The “Significance” of Toxic Health Risks: An Essay on Legal Decisionmaking Under Uncertainty, 10 ECOLOGY L.Q. 339, 373-86 (1982) (discussing difficulty of determining whether risks associated with exposure to toxic chemicals are “significant”).


zene case, the agency conceded its generic policy was unenforceable.263 The Reagan administration at first planned to withdraw the entire cancer policy, but it apparently has changed its mind.264 Whether a generic policy could be adopted that would avoid the time-consuming adversarial confrontations that have so greatly slowed the present process is unclear.265

In American Textile Manufacturing Institute v. Donovan,266 the Supreme Court upheld OSHA's cotton dust standard by deciding that Congress had not required that the benefits of the rule be reasonably related to the costs.267 The Court found that the statutory language, the structure of the Act, and the legislative history all failed to support the conclusion that a cost-benefit analysis was required.268 Instead, the Court believed that Congress itself struck a balance between costs and benefits by ordering that OSHA place "the 'benefit' of worker health above all other considerations" except those technological or economic considerations that would make the "attainment of this 'benefit' unachievable."269

The result in the cotton dust case was a bitter disappointment to the Reagan administration, which had promised to promulgate no significant rules in executive agencies like OSHA unless they met cost-benefit standards.270 The agency's response to the decision in the cotton dust case has been to subject existing, proposed, and new emission standards to such a high level of scrutiny that the pace of regulatory progress has slowed to a crawl.271 OSHA promulgated no standards for additional control of chemicals during the first two years of the Reagan administration. Indeed, the only standard adopted during that period deregulated control of asphalt fumes.272 In the third year, OSHA adopted an emergency temporary standard for asbestos fibers and a hazard warning rule. It also proposed two new emission standards,273 although one of those standards was proposed only after union and public interest groups obtained a court order that required OSHA to expedite the proposal.274 The agency has made no attempt to finish the NIOSH-OSHA effort to strengthen

265. See supra text accompanying note 227 (different values prevent agreement among employers, employees, and OSHA concerning policy judgments).
267. Id. at 540-41. The Court did not reach the further problem of whether feasible means only "technologically" possible or if it means "economically" possible as well. Id. at 530 n.55.
268. 452 U.S. at 506-22.
269. Id. at 509.
271. See 13 O.S.H. Rep. (BNA) 812 (1984) (grain elevator rule delayed by OMB review for seven months); Sun, Agencies in Dispute Over Cancer Policy, 217 SCIENCE 233 (1982) (OSHA-NIOSH dispute concerned whether direct evidence of human carcinogenicity necessary to regulate formaldehyde); see generally 13 O.S.H. Rep. (BNA) 422 (1983) (OSHA considered amending act to obtain greater latitude to do cost-benefit analysis); Smith, OSHA Shifts Directions on Health Standards, 212 SCIENCE 1482-83 (1981) (OSHA director Auchter promised "we're certainly not going to be rushed in what we do in the regulatory area . . . ").
272. See infra Appendix II (summarizing time required for agency rulemaking).
273. See id.
the consensus standards, so that by the end of 1983, OSHA admitted it had inactive rulemaking efforts for 116 substances.\footnote{275} Instead, OSHA has been reviewing methods to adopt less costly compliance mechanisms\footnote{276} and has been extensively reconsidering the previously enacted exposure standards.\footnote{277} In the meantime, OSHA has stayed the enforcement of some of those standards.\footnote{278}

OSHA's leisurely pace has prompted criticism by prominent professional health organizations\footnote{279} and lawsuits by public interest groups and labor unions.\footnote{280} Considerable regulatory delay is inevitable unless there is adequate information about a substance and agreement concerning which policy values should control agency decisions. Public policy analysts have proposed that costs be analyzed by criteria such as cost-effectiveness, which would minimize expenditures once a regulatory goal is chosen. The necessary determinations, however, can still involve the same clash of values that plagued cost-benefit analysis.\footnote{281} Thus, unless agreement can be reached among labor, industry, and OSHA concerning risk and cost assessment, controversy and delay can be expected to continue indefinitely.

Market and regulatory responses to occupational disease appear to have failed. Available evidence suggests that workers have not received significant wage premiums in the labor market. Somewhat better evidence establishes that workers have not collected workers' compensation or tort recoveries as \textit{ex post} compensation. OSHA, intended as a vehicle to prevent occupational disease

\begin{footnotes}
\item 275. 13 O.S.H. REP. (BNA) 405 (1983).
\item 277. \textit{See} 48 Fed. Reg. 26,962 (1983) (proposed rule for cotton dust); 46 Fed. Reg. 22,764 (1981) (advanced notice of proposed rulemaking for lead); \textit{see also supra} note 264 (reevaluation of the cancer policy); \textit{infra} notes 306 to 309 (proposed revisions of the records access rule). Efforts at reevaluation may have effectively prevented the agency from work on new standards. \textit{Smith, supra} note 271, at 1483.
\item 281. Under a cost-effective methodology, the policy analyst would estimate the cost of alternative methods of compliance with the same health standard and choose the least expensive, Nichols \& Zeckhauser, \textit{supra} note 240, at 58, but alternative methods of compliance can be compared only when they achieve the same benefit or level of effect. \textit{MacCarthy, supra} note 238, at 794. More fundamentally, information may be not available to calculate the level of effect of the alternative methods. Analysts have also proposed that the marginal cost per disease be equalized for various regulations. Under this approach, policy analysts would estimate the cost of alternative standards for different industries and the number of illnesses that would be prevented under each standard. These figures would allow at least a rough calculation of marginal cost or how much it would cost to prevent one additional illness by adopting the next stricter standard for each industry. Standards with low incremental costs would be vigorously pursued and those with high incremental costs would be relaxed in order to maximize the number of illnesses avoided for a given level of expenditure. At some point, there would be an equal marginal cost figure for all industries that would produce that maximum benefit. Nichols \& Zeckhauser, \textit{supra} note 240, at 58. Since the methodology does not specify at what level marginal cost should be set or what should be the total social cost of the regulations, MacCarthy, \textit{supra} note 238, at 795, OSHA decisions based on this cost-effective approach would continue to be controversial.
\end{footnotes}
and therefore to reduce the need for *ex post* compensation, has failed to act on most of the workplace hazards that require attention.

Proposed regulatory reforms recognize that regulation will be ineffective if it requires the same information absent from the labor markets. By and large, however, these reforms have met with limited success. The reform of state workers’ compensation laws has been slow. Reforms proposed for tort compensation make recovery even more difficult. Finally, attempts by OSHA to regulate using a generic policy which takes into consideration this lack of information have been stymied by the Supreme Court.

The lack of information is a key element in the failure of markets and regulation to prevent occupational disease. As a result, state governments, OSHA, and the NLRB have all attempted to produce additional information about occupational disease through regulation of employers. The nature, adequacy, and legality of this regulation is considered in the next two sections.

IV. Regulation to Force Disclosure of Information

A. OSHA and State Regulation

OSHA and the states have promulgated two types of regulation that require employers to disclose health-related information. The most common requirement is that employers provide some type of hazard warning. Some jurisdictions also require employers to give employees access to their exposure and medical records.

Hazard warning regulations are of two types. OSHA\(^2\) and sixteen states\(^3\) are authorized to require employers to warn employees about a hazard as part of the regulation of employee exposure to that hazard. Seven states are authorized to require hazard warnings independent of exposure regulation\(^4\) and OSHA has claimed a similar authority.\(^5\) OSHA recently promulgated a rule that requires manufacturers to provide warnings for any chemical that can be


considered "hazardous." The employer is required to place a warning label on the sources of the hazard, to provide employees with a material safety data sheet (MSDS), and to train employees to use the information provided. The warning must identify the hazardous chemical unless its identity is a trade secret, and must give appropriate precautions. The MSDS, which is to be developed by the manufacturer of the chemical, must identify the chemical unless its identity is a trade secret and must state whether it is a carcinogen, indicate whether there are applicable exposure limits, and give appropriate safety instructions. The OSHA rule purports to preempt all state emergency rules.

Regulations concerning access to records are also of two types. The more common type requires employee access to exposure or medical records as part of the regulation of employee exposure to a hazard. OSHA and sixteen states require employers to maintain exposure records and to give safety agencies and employees access to such records. OSHA has interpreted this authority to allow an employee to have access to the exposure records of all employees, and some state laws require such access. OSHA and twelve states require employers to maintain medical records as part of exposure

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286. 48 Fed. Reg. at 53,340. The program must be detailed in writing. Id. at 53,343. A chemical is hazardous when it poses a physical or health hazard because it might be a carcinogen or otherwise dangerous to those employees who are exposed "under normal conditions of use or in a foreseeable emergency." Id. at 53,340-41. A chemical is considered to be a potential "carcinogen" when an authoritative scientific or governmental body or a reliable scientific study has so found. Id. apps. A & B at 53,341, 53,346-47.

287. Id. at 53,343.

288. Id. at 53,343-44.

289. Id. at 53,344.

290. Id. at 53,343.

291. Id. at 53,343-44.

292. See infra note 500 (announcement of OSHA administrator).


294. ARIZ. REV. STAT. ANN. §§ 23-410(c), 23-427(c) (1983); CAL. LAB. CODE §§ 142.3(d), 6408(d), 6408(e) (West Supp. 1983); CONN. GEN. STAT. ANN. §§ 31-372(d), 31-374(c)(3) (West Supp. 1982); ILL. ANN. STAT. ch. 48 § 59.2(k) (Smith-Hurd Supp. 1982); IND. CODE ANN. § 22-8-1.1-17.1(a), (c) (Burns 1974); IOWA CODE ANN. § 88.6.3.c (West 1972), § 88.5(4) (West Supp. 1982); MD. ANN. CODE art. 89 § 33(c) (1979); MICH. COMP. LAWS ANN. §§ 408.1024(7), 408.1061(2), (3) (West Supp. 1982); MINN. STAT. ANN. §§ 182.655(10), 182.663(3) (West Supp. 1982); NEV. REV. STAT. §§ 618.295(7), 618.380 (1977) (wording different but same requirements); N.M. STAT. ANN. §§ 50-9-7(c), 50-9-11(B) (1978); N.C. GEN. STAT. § 95-145(c) (1981); R.I. GEN. LAWS § 28-20-11(c) (1979), § 28-20-24 (Supp. 1982); S.C. CODE ANN. § 41-15-100 (Law. Co-Op. 1976); UTAH CODE ANN. tit. § 35-9-8(3) (1974); WASH. REV. CODE ANN. §§ 49.17.220(3), 49.17.240(2) (Supp. 1983). Another state, New York, requires employers to keep and make available records of every employee who "handles or uses substances" listed in the regulation of employee exposure to a hazard. N.Y. LAB. LAW § 879 (McKinney Supp. 1982).


296. New Mexico allows an employee access to his or her personal exposure records only. N.M. STAT. ANN. § 50-9-11(B) (1978). A few states have ambiguous provisions which simply grant employees access to exposure records, without specifying whether this includes general and/or personal exposure records. See, e.g., CAL. LAB. CODE § 6408(d) (West Supp. 1983) (employees have access to "accurate records of employee exposures . . . "); NEV. REV. STAT. § 618.295 (1979) (employees may "obtain the results" of required exposure records); Minn. Stat. Ann. § 182.663(3) (West Supp. 1982) (employees or their representatives "have access to" required exposure records). Two states that do not give workers access to exposure records do require employers to notify employees of exposure beyond prescribed safety limits. See TENN. CODE ANN. § 50-3-203(c)(2) (1983); W. VA. CODE § 21-3-18(d) (1981).


298. Nine of these states grant access to the employee's physician and not directly to the employee. ILL. ANN. STAT. ch.48 ¶ 137.4(h) (Smith-Hurd Supp. 1982); IND. CODE ANN. § 22-8-1.1-17.1(a), (Burns
regulation, to give the agencies access to all the records, and to give an employee, or that person's physician, access to that individual's record. OSHA\textsuperscript{299} and a few states\textsuperscript{300} also require that employers give employees access to voluntarily maintained exposure and medical records. OSHA's rule, for example, requires that most businesses\textsuperscript{301} give the government, any employee who works where "there will be exposure to toxic substances,"\textsuperscript{302} or that person's designated representative,\textsuperscript{303} access to any exposure or medical records that are kept for any substance in the NIOSH Registry of Toxic Effects of Chemical Substances (RTECS).\textsuperscript{304} If there are no exposure records, employers are required to disclose to employees "any other record (such as purchase orders) which might reveal the identity . . . of a toxic substance."\textsuperscript{305}

The Reagan administration has proposed several important modifications to the OSHA rule concerning voluntarily maintained records. The proposed amendments would require employers to provide access to records only for those substances on the RTECS listing for which there was independent evidence of human or animal toxicity. Consequently, the proposed rule would apply to only about 3,500 substances instead of the approximately 39,000 covered by the existing rule.\textsuperscript{306} The proposed rule would also reduce the time during which medical records had to be maintained\textsuperscript{307} and would eliminate the employee's right to examine the exposure records of other employees\textsuperscript{308} or

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\item [301] The rule applies to general industry, maritime and construction employers. 29 C.F.R. § 1910.20(b)(1) (1983).
\item [302] Id. § 1910.20(c)(4). An employee's access to medical records is limited if disclosure would adversely affect the health of the employee, in which case disclosure is to be made to the employee's designated representative. Id. § 1910.20(c)(2)(ii)(D).
\item [303] Id. § 1910.20(c)(3). The employee's consent is required for any disclosure to a third party, except for disclosure to a labor union. Id.
\item [304] Id. § 1910.20(c)(11).
\item [305] Id. § 1910.20(c)(iv) (applies to any record which reveals the chemical, common, or trade name of a toxic substance).
\item [307] The present rule requires records to be maintained for the duration of employment plus 30 years. 29 C.F.R. § 1910.20(d)(1)(i) (1983). The proposed modification would require that medical records be kept only for the period of employment plus five years or for 30 years, whichever is longer. 47 Fed. Reg. at 30,435. Employers would not be required to preserve the records of employees who worked for them less than one year if the records were given to the employee upon termination. Id.
\item [308] Compare 47 Fed. Reg. at 30,436 (1982) (employees can obtain access to other persons' exposure
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to examine other records if no exposure records were available.\textsuperscript{309}

Hazard warnings would apprise workers that they were being exposed to dangerous substances and that they should take the precautions recommended in the warnings to protect themselves. Armed with this knowledge, workers could attempt to secure \textit{ex ante} compensation for these dangers. In addition, employees are more likely to relate serious illnesses to workplace hazards when they have been previously warned that their workplace may be dangerous. Warnings therefore should also increase the rate at which \textit{ex post} compensation is sought. Employees could use their access to medical and exposure records to obtain evidence for workers' compensation, tort, and OSHA proceedings and to monitor employer compliance with applicable health regulations. The usefulness of this information, however, depends on how readily it is available.

Under existing statutory authority workers will not always receive the information they require. Under federal and some state legislation, employers can be ordered to provide hazard warnings and to retain and disclose records as part of the regulation of employee exposure to a specific hazard.\textsuperscript{310} Workers will benefit, however, only when a health agency is in a position to issue such regulations. OSHA's history strongly suggests that promulgation of regulations concerning exposure records is a time-consuming and difficult task.\textsuperscript{311}

Under federal and some state legislation, employers can also be ordered to give employees access to medical and exposure records that the employers voluntarily maintain.\textsuperscript{312} Nevertheless, employees still may not obtain much information. Many employers do not voluntarily keep medical and exposure records concerning their employees, probably because of the expense involved. Employers may also wish to avoid providing employees with information that could assist them in making compensation claims against the employer.\textsuperscript{313} In the absence of a legal order, employers would be compelled to give access to records only if enough other employers provided similar access and, as a result, competition for workers required that employers offer the information as part of their fringe benefits.\textsuperscript{314}

These loopholes in statutory authority can be remedied by authorizing regulatory agencies to order employers to provide hazard warnings and to maintain and disclose records independent of any exposure regulation. These actions would be useful when existing information is insufficient to allow exposure regulation, but is sufficient to raise doubts about the safety of a substance.

Two further limitations on the scope of disclosure affect the usefulness of

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\item records only in the absence of such personal records) with 29 C.F.R. §§ 1910.20(b)(2), .20(c)(4), .20(e) (1983) (workers can obtain access to anyone's exposure records).
\item 310. \textit{See supra} text accompanying notes 282 to 283 and 293 to 294.
\item 311. \textit{See supra} text accompanying notes 214 to 224 (discussing delay in OSHA rulemaking).
\item 312. \textit{See supra} text accompanying notes 299 to 305 (discussing OSHA authority and state legislation ordering employers to disclose voluntarily-maintained records); \textit{but see infra} text accompanying notes 330 to 351 (discussing OSHA's authority to order disclosure of trade secrets).
\item 313. \textit{Comment, Occupational Health Risks and the Workers' Right to Know}, 90 YALE L.J. 1792, 1797-98 (1981).
\item 314. \textit{Risk By Choice}, \textit{supra} note 73, at 69.
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information regulation to workers. The Carter administration’s records access rule$^{315}$ and proposed hazard warning rule$^{316}$ applied to virtually all businesses that used hazardous substances. The Reagan administration, by comparison, has limited the coverage of its hazard warning rule to manufacturing industries.$^{317}$ Although the warning rule covers fourteen million workers, the AFL-CIO claims it excludes more than sixty million workers exposed to toxic chemicals in the construction, service, health care, and transportation industries.$^{318}$ OSHA has admitted that “exposures to hazardous chemicals are occurring in other industries as well,” but the agency claims it “has merely exercised its discretion to establish rulemaking priorities, and chosen to first regulate those industries with the greatest demonstrated need.”$^{319}$

A similar disagreement exists concerning the types of substances that should be covered. The records access rule, adopted during the Carter administration, covers the 39,000 chemicals on the NIOSH RTECS listing.$^{320}$ The hazard warning rule, promulgated during the Reagan administration, applies to only those substances for which there has been an authoritative determination of dangerousness or potential dangerousness.$^{321}$ OSHA and the American Conference of Governmental Industrial Hygienists have made such an authoritative determination for about 600 substances.$^{322}$ OSHA has estimated that, under a similar limitation proposed for the records access rule, about 3,200 substances would be covered.$^{323}$

OSHA has defended the narrower scope of the hazard warning rule on the ground that its purpose “is to provide information about chemicals which are in fact hazardous.”$^{324}$ The agency also asserted that additional information is available through the broader records access rule.$^{325}$ OSHA, however, has also proposed to narrow the records access rule on the ground it is “overinclusive.”$^{326}$ If this proposal is enacted, workers will receive information concerning only a very small number of the chemicals used in the workplace.$^{327}$

These restrictions on the scope of disclosure could significantly impede the development of information about the thousands of chemicals now used in the workplace. Restricting disclosure to manufacturing industries and to substances now known to be potentially dangerous could chill the development of

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315. See supra note 299.
317. See supra note 286.
318. 3 EMPLOYMENT SAFETY & HEALTH GUIDE (CCH) ¶ 8036 (Nov. 28, 1983).
319. 48 Fed. Reg. at 53,286 (1983). OSHA drew its conclusion that the greatest need for regulation existed in manufacturing industries from evaluation of Bureau of Labor Statistics (BLS) data that indicated that nearly one-half of all reported chemical source injuries occurred in the manufacturing sector. Id. at 43,284-85. The BLS data may seriously underestimate the extent of occupational illnesses, see supra note 37 (reported data underestimate incidence of disease), but OSHA thought that the “statistics nonetheless reveal patterns of occurrences in the various industries for which they are compiled.” Id. at 53,284.
320. 29 C.F.R. § 1910.20(c)(11).
321. See supra note 286 (rule applies to “hazardous” substances).
322. 3 EMPLOYMENT SAFETY AND HEALTH GUIDE (CCH) ¶ 8036 (Nov. 28, 1983).
323. See supra note 306.
325. Id.
327. See supra note 4.
information about chemicals for which there is presently insufficient information. Increasing disclosure, however, is costly and may involve chemicals which are not dangerous. The current alternatives offer an all-or-nothing choice between covering all industries and many thousands of chemicals or covering only manufacturing industries and a few thousand chemicals. A better solution would be to attempt to graduate the regulatory response to the necessity for information disclosure.

Under a graduated approach, employees would be entitled to know the names of chemicals to which they were exposed, subject to appropriate trade secret requirements. Any additional obligations would be imposed based on a determination of whether further measures were necessary to protect workers. These other obligations would include disclosure of voluntarily kept records, disclosure of required records, and provision of hazard warnings. In this manner, the disclosure required of an industry could be matched to the needs of workers and regulatory agencies for more information about a substance.

B. THE LEGALITY OF REQUIRING DISCLOSURE OF INFORMATION

Opponents have challenged the legality of OSHA's records access and hazard warning rules. The records access rule was challenged by an industry group which claimed that OSHA lacked the statutory and constitutional authority to order the disclosure of information. The hazard warning rule was challenged by labor unions and by states with their own disclosure laws. Both groups argued that the agency had issued its warning rule in order to preempt stronger local laws and that the rule ignored the plight of workers in non-manufacturing industries. The legality of requiring disclosure of non-trade-secret information is considered in the next section and that of requiring disclosure of trade secret information in the following section.

1. Disclosure of Non-Trade-Secrets

Some states have clearly authorized the forced disclosure of information, but for most agencies, including OSHA, the authority to require disclosure is governed by an ambiguous patchwork of statutes and recent judicial decisions. For these agencies, it is arguable that the authority to order disclosure of information exists, although additional legislation may be necessary to clarify the matter.

An agency's authority to order disclosure of private information is also restricted by constitutional constraints. If forced disclosure of information can be considered to be a governmental search or seizure, fourth amendment limitations would apply. Moreover, the disclosure of medical records could implicate privacy concerns. Nevertheless, under prevailing authority, regulations requiring information disclosure should be considered to be constitutional.

329. See supra notes 284 and 298 (listing states which have authorized forced disclosure of information).
Statutory Authorization.

OSHA's authority to force disclosure of information was considered in *Louisiana Chemical Association v. Bingham*. In *Louisiana Chemical*, OSHA argued that its authority to adopt the records access rule was derived from its power to promulgate "safety and health standards" addressing any condition reasonably necessary or appropriate to provide safe or healthful employment. OSHA has claimed the same authority for its hazard labeling rule. The Fifth Circuit, however, held that the records access rule could not be issued as a standard. The *Louisiana Chemical* court interpreted the structure of OSHA's enabling legislation as divided into two parts. One provided for regulation of hazards by adoption of "standards" and the other for investigation to determine whether hazards in fact existed. Since the records access rule was intended to serve the purpose of investigation into possible hazards, the court concluded that the rule had to be justified under that section of the legislation.

OSHA has seized on this distinction to argue that its hazard warning rule is a standard. OSHA has argued that "the practices mandated by the standard—hazard evaluations, written hazard communication programs, labels and other forms of warning, material safety data sheets, and education and training—are, at bottom, directed not merely at the identification of workplace chemicals, but more significantly at the correction of their hazards as well." According to OSHA, the hazard warning rules promotes more than investigation because with the information they are given, workers can take action to protect themselves.

The records access rule also produces information that will allow employees to take preventive actions. The difference is that in the hazard warning rule the employer is required to furnish information about prevention while in the records access rule the employer is required to furnish only the raw data that will allow the employee to seek such information. The Fifth Circuit in *Louisiana Chemical* may have misunderstood the linkage between the production of information and its preventive effects. Nevertheless, courts may be unwilling to base their determinations of which regulations can be called "standards" on the strength of the linkage between disclosure and prevention. A clearer definition would be to limit the meaning of "standards" to include only those regulations that control the degree of exposure to a chemical or otherwise regulate what constitutes a safe workplace by limiting the types of machinery or other equipment that may be used.

The determination whether information regulations are standards is impor-
t Hart because OSHA's alternative sources of authority for these rules, its investigatory and rulemaking authority, are problematic. Both of these possibilities were considered in *Louisiana Chemical*. The Fifth Circuit remanded the litigation to the district court to determine whether the access rule was authorized by the investigatory portion of the OSHA act. The district court affirmed the rule, however, by concluding that OSHA could promulgate the regulation under its residual authority to "prescribe such rules and regulations as [are] necessary to carry out" its responsibilities under the act.338

The district court justified its choice of the residual rulemaking authority on the basis of the Supreme Court's decision in *Mourning v. Family Publications Service, Inc.* 339 In *Mourning*, the Court held that the Federal Reserve Board had authority under its residual rulemaking authority to promulgate a Truth-in-Lending (TIL) regulation because the rule was "reasonably related" to the purposes of the TIL legislation.340 The Court rejected an argument that because the TIL statute specifically authorized forced disclosure in regard to some matters, disclosure in other situations was not authorized. Such an interpretation, the Court held, would cause the "flexibility sought in vesting broad rulemaking authority in an administrative agency" to be lost.341

The district court was justified in interpreting OSHA's residual rulemaking authority broadly. *Mourning* and subsequent Supreme Court cases342 indicate that where there is no clear contrary congressional intent, agencies can use their residual powers creatively to promote the purposes for which they were created. Since OSHA's records access rule clearly serves the purposes for which OSHA was created,343 the court should be reluctant to limit regulation of disclosure unless Congress specifically prohibits such regulation.

In an attempt to distinguish *Mourning*, opponents of OSHA's records access rule have argued that where sensitive issues of trade secrecy and personal privacy are involved, the Supreme Court, in *Detroit Edison Co. v. NLRB*,344 has

338. Louisiana Chem. Ass'n v. Bingham, 550 F. Supp. 1136, 1138 (W.D. La. 1982) (quoting 29 U.S.C. § 657(g)(2) (1976)). The district court avoided locating the authority for OSHA's regulation in the agency's investigatory power because that authority is constrained by limitations that the rule apparently exceeded. OSHA is authorized to require that employers create, maintain, and reveal to the agency records that are needed to carry out OSHA's responsibilities or to develop information about occupational disease. 29 U.S.C. § 657(c)(1). The authority, however, does not appear to extend to the forced disclosure of voluntarily created records. OSHA's hazard warning rule, which does not require the creation of records, might be authorized by this section, although the statute speaks only about disclosure to OSHA and not about direct disclosure to employees. Id. Moreover, it is questionable whether OSHA can collect required records without a subpoena. See infra text accompanying notes 352 to 368 (discussing impact of fourth amendment on OSHA's authority to order disclosure of information).


340. 411 U.S. at 369.

341. Id. at 372-73.


343. 550 F. Supp. at 1138-39. The district court found that the records access rule served the statutory purposes enumerated in 29 U.S.C. § 651(b)(5) (enhance research), (b)(6) (discover latent diseases), (b)(12) (establish reporting procedures), and (b)(13) (encourage joint labor-management efforts to reduce employment-related diseases).

344. 440 U.S. 301 (1979).
refused to allow agencies the same broad authority to force disclosure of information. The Court thus did not face the same issue as in Mourning of whether an agency's residual rulemaking powers are sufficient to allow it to require disclosure of information. More importantly, the Court did not hold that the NLRB lacked the authority to order disclosure of sensitive information, but that the need for the information had to be balanced against the reasons for keeping it confidential. OSHA engaged in such a balancing process when it ordered hazard warnings and employee access to exposure and medical records. Finally, the Detroit Edison Court was influenced in part by the NLRB's inability, in the posture of the case, to issue effective protective orders to keep information confidential and by the willingness of the employer to release the information under conditions that protected its confidentiality. By comparison, OSHA has required measures to protect the confidentiality of information released under the hazard warning and records access rules.

Constitutional Constraints. The impact of the fourth amendment on forced disclosure of information depends on whether the disclosure is characterized as being to private parties or to government agents. The fourth amendment only protects individuals from being required to disclose information to the government without proper process.

In Burdeau v. McDowell, the government used in a criminal prosecution evidence that had been obtained by private detectives without government knowledge or participation. The Supreme Court refused to exclude the evidence because the government had no connection with the search and seizure by the detectives. The rationale of Burdeau was extended in United States v. Harvey, in which the Eighth Circuit held that the telephone company's use of an electronic device to detect use of products that allowed consumers to avoid long-distance charges was a private search even though it was author-

345. See infra text accompanying notes 517 to 531 (discussing Detroit Edison).
346. The NLRB determination that the employer's "duty" to provide information included disclosure of the testing information was made in an adjudication. 440 U.S. at 309-310.
347. Id. at 318.
348. See infra note 388.
349. The union was not a party to the enforcement proceedings, and under both Fed. R. Civ. P. 65(d) and the Board's regulations, it was doubtful that contempt sanctions could be issued against it. 440 U.S. at 315-16.
351. See infra text accompanying notes 403 to 418 (discussing restrictions on disclosure of trade secrets under hazard warning and record access rules).
352. 256 U.S. 465 (1921).
353. Id. at 475.
354. Id. at 476. Burdeau has been distinguished where government agents participate in the search, see Stapleton v. Superior Court, 70 Cal. 2d 97, 100, 447 P.2d 967, 969, 73 Cal. Rptr. 575, 577 (1968) (joint search by police and special agents of credit card companies), or where government agents initiate the search. See Cornogold v. United States, 367 F.2d 1, 5 (9th Cir. 1966) (customs agent asked airline employee to inspect package placed with airline for shipment); People v. Tarantino, 45 Cal. 2d 590, 595, 290 P.2d 505, 509 (1955) (police chief hired private sound engineer to install eavesdropping equipment). In these instances, the courts have found obtaining the fruits of the private search to be a "governmental purpose:" See United States v. Davis, 482 F.2d 893, 904 (9th Cir. 1973) (search of carry-on luggage pursuant to FAA regulations governmental because regulation serves a public anti-hijacking purpose).
355. 540 F.2d 1345 (8th Cir. 1976).
OCCUPATIONAL DISEASE

OSHA has asserted that its regulations requiring disclosure of information to employees are designed to achieve private purposes. Access to the information will facilitate employee action in wage negotiations, in workers' compensation litigation, and in consultation with medical advisers concerning the riskiness of workplace hazards. While workers undoubtedly will give OSHA some of the information disclosed for use in the prosecution of employers for violations of the act, this possibility should not be sufficient to make the regulation a governmental search unless OSHA intends that result as its motive for the regulation. In other contexts, the Supreme Court has accepted an agency's characterization of its reasons for similar actions.

If disclosures that are made to employees are characterized as constituting government searches, they will be treated in the same fashion as the regulations that require an employer to make disclosures directly to the government. Disclosures of this type are governed by the tests announced in Oklahoma Press Publishing Co. v. Walling. In Oklahoma Press, the Supreme Court held that the probable cause requirement of the fourth amendment was satisfied for an administrative subpoena if an agency showed that it had congressional authority to conduct the investigation, that the information sought was relevant to the authorized purpose, and that the subpoena was not ambiguous or excessively broad. Using this test, the Court enforced a Labor Department subpoena for an employer's wage records as part of an investigation into compliance with the Fair Labor Standards Act. The Court justified its test on the ground that fourth amendment protections are narrower for corporations than for private individuals. The Court thus held that an agency was not required to establish that it had reason to believe a violation of the law had occurred to obtain enforcement of a subpoena. In United States v. Morton Salt Co., the Supreme Court reached a similar conclusion concerning a Federal Trade Commission order that Morton Salt make periodic reports to show that the company was in compliance with a cease and desist decree. The Court considered the matter to be covered by its reasoning and decision in Oklahoma Press, and it ordered that the same test be applied to government-

356. Id. at 1353 n.10; accord United States v. Andrews, 618 F.2d 646, 650 (10th Cir.) (search of baggage by airline employee pursuant to federal statute allowing airlines to refuse to transport goods if consent to search denied not public search), cert. denied, 449 U.S. 824 (1980); United States v. Rodriguez, 596 F.2d 169, 172-73 (6th Cir. 1979) (same).

357. See Bell v. Wolfish, 441 U.S. 520, 544-48 (1979) (prison administrator's judgment concerning random and unobserved room searches entitled to wide-ranging deference when needed to maintain institutional security).

358. 327 U.S. 186 (1946).

359. Id. at 208-09; see United States v. Powell, 379 U.S. 48, 57-58 (1964) (IRS Commissioner not required to meet any standard of probable cause to obtain enforcement of summons; need only show that investigation will be conducted pursuant to a legitimate purpose, that the inquiry may be relevant to the purpose, that the procedures required by the Code have been followed in issuing the summons, and that the information sought is not already within the IRS's possession.)

360. 327 U.S. at 216.

361. Id. at 205-06.

362. Id. at 208-09.


364. Id. at 652-53.
mandated reports.\textsuperscript{365}

Regulations that require employers to make disclosures concerning workplace hazards are similar to the type of report that the Court sanctioned in \textit{Morton Salt}. In both cases, a private party is required, under threat of sanction, to disclose certain information in a certain format. Further, OSHA and other agencies can justify their regulations as consistent with the requirements set by \textit{Oklahoma Press}. A legislature would have the authority to authorize them, the information sought is highly relevant to the agency's statutory responsibilities, and the description of what information is sought is clear and not overly broad. In a similar context, OSHA has been successful in justifying its subpoenas for information under the same tests. In \textit{Donovan v. Union Packing Co.},\textsuperscript{366} for example, the Eighth Circuit held that a subpoena to obtain company records concerning the number of worker illnesses and injuries was enforceable.\textsuperscript{367} Specifically, the court held that all three requirements of \textit{Oklahoma Press} were met, and that OSHA had the authority to subpoena information independent of an inspection of a firm's premises.\textsuperscript{368}

Forced disclosure of medical records may also implicate constitutional privacy concerns. In \textit{Whalen v. Roe},\textsuperscript{369} the Supreme Court declared that a constitutional right of privacy protects independence in making certain personal decisions and provides freedom from forced disclosure of certain personal matters.\textsuperscript{370} In \textit{Whalen}, the Court reviewed a New York statute that required that copies of physicians' prescriptions for certain dangerous drugs be forwarded to the state to allow authorities to monitor possible misuse of the drugs.\textsuperscript{371} The Court approved the disclosure of the information to the state because the disclosure was not "meaningfully distinguishable" from the usual invasion of privacy that occurs in modern medical practice when patient information is routinely shared among physicians, hospitals, insurance companies, and public health officials.\textsuperscript{372} The Court also saw no realistic possibility that state officials would disclose the information to others because of strict security

\textsuperscript{365} \textit{Id.} The required production of information can raise fifth amendment concerns, but these concerns should not apply in the occupational health context. \textit{Compare Shapiro v. United States}, 335 U.S. 1, 32 (1948) (no violation if records relate to regulatory activity) \textit{with Marchetti v. United States}, 390 U.S. 39, 57 (1968) (violation if records are essentially private and may be used for criminal prosecution).

\textsuperscript{366} 714 F.2d 838 (8th Cir. 1983).

\textsuperscript{367} \textit{Id.} at 842. The employer had argued that Marshall v. Barlow's, Inc., 436 U.S. 307 (1978), had held that documents could be obtained constitutionally only by use of a search warrant. \textit{Id.} at 841. The court declined to adopt this interpretation because it would negate one of the methods used by OSHA to gather information to justify search warrants. \textit{Id.}

\textsuperscript{368} \textit{Id.} at 839-40. OSHA has clear authority to subpoena documents. 29 U.S.C. § 657(b) (1982). OSHA can meet the requirement of relevance because, under the case law that has developed since \textit{Oklahoma Press}, no greater indication of relevance is necessary than to show that the information would be useful in developing further information about occupational disease or a violation of some statute or rule. \textit{See Cooper, Federal Agency Investigations: Requirements for the Production of Documents}, 60 Mich. L. Rev. 187, 191 (1961) (burden of showing relevance met when affidavit sets forth information and indicates why agency believes subpoenaed material will substantially aid investigation). The only real constraint on OSHA would be the requirement that a subpoena not be excessively broad, which the agency could presumably meet.

\textsuperscript{369} 429 U.S. 589 (1977).

\textsuperscript{370} \textit{Id.} at 599-600.

\textsuperscript{371} \textit{Id.} at 591-93.

\textsuperscript{372} \textit{Id.} at 602.
provisions intended to prevent such disclosure.373

In Nixon v. Administrator of General Services,374 the Supreme Court reinterpreted Whalen by using a balancing test that compared the government’s need for the information with the individual’s interest in its confidentiality.375 The Court rejected a claim that a statute establishing government custody of President Nixon’s White House papers was an unreasonable invasion of privacy.376 The Court determined that the “important public interest in preservation of the materials” exceeded the former President’s limited privacy interest in the papers.377 The Court stated that Mr. Nixon’s interest in the privacy of the papers was limited because almost all the papers concerned presidential duties and not family matters.378 Since a President could only have a limited expectation of privacy concerning his papers and since the government intrusion, which consisted of cataloging of the materials by government archivists, was limited, the Court concluded that the statute was constitutional.379 The Court also rejected an argument that the possibility of public disclosure constituted an unreasonable invasion of privacy because the statute provided for confidentiality and the archivists had a reputation for discretion.380

Most litigation involving the forced disclosure of occupational health records to OSHA and NIOSH has concerned whether government access to employee medical records is permissible.381 Courts that have considered the matter have held that Whalen does not prevent government access.382 United Steelworkers of America v. Marshall383 upheld the portion of OSHA’s lead

381. The disclosure of medical records to nongovernment personnel required by the OSHA records access rule, 29 C.F.R. § 1910.20(e)(2) (1983), should pose no privacy problem because prior employee consent is required for public disclosure. Id. § 1910.20(e)(2)(A). Public disclosure of medical records was upheld in Louisiana Chem. Ass’n v. Bingham, 550 F. Supp. 1136, 1142 n.4 (W.D. La. 1982) (no privacy problem because of employee consent). Despite the express requirement of employee consent, OSHA might be able to defend disclosure without consent if the public need for such action exceeded the employee’s privacy interests. See United Steelworkers of Am. v. Marshall, 647 F.2d 1189, 1243-44 (D.C. Cir. 1980) (disclosure of small portion of medical records implicates no privacy interest); cf. Plante v. Gonzalez, 575 F.2d 1119, 1135-36 (5th Cir. 1978) (state senator’s interest in privacy of personal finances outweighed by public’s interest in financial disclosure), cert. denied, 439 U.S. 1129 (1979). The disclosure of exposure records poses no privacy problem because the privacy interests are minimal and are clearly outweighed by the need for access. Preamble to Final Rule on Access to Exposure, Medical Records, 45 Fed. Reg. 35,212, 35,272 (1980) [hereinafter cited as Preamble to Records Access Rule].
emissions standard that required employers to maintain certain types of medical records and to disclose those records to OSHA and NIOSH without employee consent.\textsuperscript{384} \textit{Louisiana Chemical Association v. Marshall}\textsuperscript{385} enforced OSHA’s records access rule, which requires disclosure of voluntarily maintained medical records.\textsuperscript{386} In both cases, the courts described \textit{Whalen} as establishing that disclosure of private medical information to public health agencies is not a constitutional violation.\textsuperscript{387} In \textit{United States v. Westinghouse Electric Corporation},\textsuperscript{388} the court upheld enforcement of a NIOSH subpoena for employee medical records because Westinghouse had failed to prove that the information in the medical records was of such a “high degree of sensitivity” that it outweighed the “substantial” public interest in allowing NIOSH to obtain the information.\textsuperscript{389} The court was concerned, however, that some medical records might contain sensitive information unrelated to occupational health matters and therefore ordered NIOSH to give prior notice to employees of its intent to examine files and to allow an opportunity to object.\textsuperscript{390} \textit{Louisiana Chemical}\textsuperscript{391} and \textit{Westinghouse Electric}\textsuperscript{392} both rejected allegations that the information obtained by the government might become public on the ground that there was no proof that such an occurrence was likely.

In \textit{General Motors Corp. v. Director of NIOSH},\textsuperscript{393} which enforced a subpoena by NIOSH for medical records without employee consent, the Sixth Circuit ruled that \textit{Whalen} allowed this sort of forced disclosure, as long as appropriate confidentiality measures were used.\textsuperscript{394} General Motors wanted to delete the names and addresses of employees from the medical records, but NIOSH argued successfully that the information was crucial to its investigation.\textsuperscript{395} The \textit{General Motors} court reached the proper result because under a balancing approach the decision should come out in favor of disclosure even without consent, as long as adequate security precautions are taken.\textsuperscript{396}

\textsuperscript{384} \textit{Id}. at 1240-41.
\textsuperscript{385} 550 F. Supp. 1136 (W.D. La. 1982).
\textsuperscript{386} \textit{Id}. at 1145.
\textsuperscript{387} The \textit{United Steelworkers} court concluded that “\textit{Whalen}, indeed, supports OSHA’s position here, since the Court clearly rejected the notion that required disclosure of private medical information to public health agencies . . . violated the Constitution . . . .” 647 F.2d at 1241. \textit{Louisiana Chem. Ass’n} quoted some of the analysis in \textit{Whalen} and concluded that “the factual background of the \textit{Whalen} case indicates . . . that the law as defined therein should be the guiding precedent for this court to follow today.” 550 F. Supp. at 1142.
\textsuperscript{388} 638 F.2d 570 (3d Cir. 1980).
\textsuperscript{389} \textit{Id}. at 579.
\textsuperscript{391} 638 F.2d at 579-80.
\textsuperscript{392} 550 F. Supp. at 1142-43.
\textsuperscript{393} 636 F.2d 163 (6th Cir. 1980), cert. denied, 454 U.S. 877 (1981).
\textsuperscript{394} \textit{Id}. at 166.
\textsuperscript{395} \textit{Id}. at 167.
\textsuperscript{396} The argument that disclosure constitutes an unacceptable interference with the privacy rights of employees and physicians should also fail. \textit{See Memorandum of James E. Grace, M.D. In Support of Motion To Intervene, at 8-11, Louisiana Chem. Ass’n v. Bingham}, 550 F. Supp. 1136 (W.D. La. 1982). In its records access rulemaking OSHA found that, since the purpose of the rule was to improve the
information available about occupational disease is clear and the need for such information is beyond dispute. OSHA has found that workers know that employee medical information is routinely shared among management officials and that widespread industrial policies concerning the acquisition and use of this information make the physician-patient relationship in this situation quite unlike the normal physician-patient relationship. Thus, the considerable public interest in disclosure outweighs the employees' limited expectation of privacy in their medical records. Procedures to protect the confidentiality of the information and to provide for employee objections to government access can easily be arranged if further protections are necessary.

2. Disclosure of Trade Secrets

For hazard warnings and records access to be effective, employees must be able to learn the identity of substances to which they have been exposed. Without that information, employees cannot determine the degree of risk associated with the exposure or establish the necessary causality to obtain ex ante compensation for work-related illnesses.

Where the employer considers the identity of a chemical to be a trade secret, its disclosure poses two types of problems. First, OSHA and the states have had a difficult time determining how regulation should proceed. Different types of regulations have been adopted and, as a result, a vigorous debate concerning the merits and demerits of each exists. Further, there are significant statutory and constitutional questions concerning the legality of requiring disclosure of trade secrets, whatever the format.

Types of Disclosure. OSHA's hazard communication rule allows manufacturers to withhold the specific chemical identity of a substance to protect its status as a trade secret. The identity of such a substance will be disclosed to physicians, epidemiologists, toxicologists, and other health professionals if those persons can meet four conditions specified in the rule.

health of workers, disclosure of medical records would be unlikely to discourage employees from seeking medical care or to discourage occupational health physicians from providing care. Preamble to Records Access Rule, supra note 381, at 35,237.

397. See supra text accompanying notes 2 to 45 (discussing unavailability of information about occupational disease).

398. See Defendant's Memorandum In Opposition to Plaintiff's Motions for Summary Judgment And In Support of Cross-Motion For Summary Judgment, at 93-98, Louisiana Chem. Ass'n v. Bingham, 550 F. Supp. 1136 (W.D. La. 1982). OSHA found that workers had to submit to examinations without a choice of physicians, company physicians testified without the consent of employees in workers' compensation and other hearings, and workers were required to sign blanket consent forms for release of information. Id. at 94-95.


400. See id. § 1913.10(e) & (f) (requiring that, where individual notice is appropriate, employees be given notice of OSHA access to medical records and providing procedures for objection to OSHA access).


402. Id.


404. Id. at 53,344.
Except when the information is needed for emergency medical treatment,\textsuperscript{405} the health professional must sign a confidentiality agreement\textsuperscript{406} and must detail in writing the confidentiality measures that will be taken,\textsuperscript{407} describe how the identity will be used for one of the purposes specified in the act,\textsuperscript{408} and establish that the identity is essential for that purpose and that other information about the substance will not suffice.\textsuperscript{409} The permissible purposes listed in the rule include medical treatment, scientific study, and hazard monitoring.\textsuperscript{410} The confidentiality agreement may include a provision for liquidated damages.\textsuperscript{411} Finally, a manufacturer is permitted to deny a request for a trade secret if it has explained its reasons for doing so in a written memo to the health professional.\textsuperscript{412} The health professional may appeal the denial to OSHA, which will determine whether the manufacturer has supported the claim that the identity is a trade secret and whether the health professional has met the four conditions specified in the rule.\textsuperscript{413} If OSHA determines the conditions were met or that the identity is not a trade secret, the manufacturer will be subject to citation by OSHA,\textsuperscript{414} with potential financial penalties.\textsuperscript{415}

OSHA's records access rule, which was promulgated during the Carter administration, does not allow employers to delete the identity of chemicals from records that must be disclosed to employees.\textsuperscript{416} If the identity is a trade secret, employees can be required to sign a confidentiality agreement, but the agreement cannot include a liquidated damages provision.\textsuperscript{417} Under the Reagan administration, OSHA has proposed a modification of the records access rule. Presumably the modified rule will include a policy on trade secrets similar to the one adopted in the hazard communication rule.\textsuperscript{418}

The vast majority of states that regulate the disclosure of information to employees, including some that order disclosure of the identity of chemicals used in the workplace, have not indicated whether trade secret information is to remain confidential. Most of these states have a general statutory prohibition against the disclosure of trade secret information by employees of occupa-

\begin{itemize}
\item \textsuperscript{405} Id. at 53,344-45. The manufacturer must identify the chemical to a treating physician or nurse in a medical emergency without the existence of a written statement or a confidentiality agreement required in the normal case. Id. The manufacturer may insist, however, that the other requirements of the Act be met when time allows. Hazard Communication Rule, supra note 403, at 53,345.
\item \textsuperscript{406} Hazard Communication Rule, supra note 403, at 53,345.
\item \textsuperscript{407} Id.
\item \textsuperscript{408} Id.
\item \textsuperscript{409} Id.
\item \textsuperscript{410} Id.
\item \textsuperscript{411} Id.
\item \textsuperscript{412} Id.
\item \textsuperscript{413} Id.
\item \textsuperscript{414} Id.
\item \textsuperscript{415} See 29 U.S.C. § 666(b) (1982) (serious violation of OSHA rule punishable by civil fine of up to $1,000 for each violation); see also id. § 666(a) (willful or repeated violation of OSHA rule punishable by civil fine of up to $10,000 for each violation).
\item \textsuperscript{416} 29 C.F.R. § 1910.20(f)(2) (1983).
\item \textsuperscript{417} Id. § 1910.20(f)(3).
\item \textsuperscript{418} 47 Fed. Reg. 30,420, 30,429-30, 30,437. The proposals for modification of the records access rule are substantially similar to those originally proposed for the hazard communication rule. 47 Fed Reg. 12,092, 12,105-06, 12,122 (1982). After receiving comments, however, OSHA significantly revised the proposals for the Hazard Communication Rule. Preamble to the Hazard Communication Rule, 48 Fed. Reg. 53,280, 53,314-20 (1983). Presumably, OSHA will consider similar criticisms before adopting final modifications of the records access rule.
\end{itemize}
tional safety and health agencies, but some states apparently lack this requirement. Those few states that have indicated how disclosure of trade secrets is to be regulated have adopted one of three different regulatory schemes: absolute protection, physician access to substance identity, or physician access to substance identity and worker access to substance identity for chemicals that are carcinogens, mutagens, or teratogens.

The state programs, however, may no longer have legal effect. In announcing its hazard communication rule, OSHA claimed that it intended to preempt all state laws on hazard communication requirements by promulgating a "standard" concerning such warnings. Congress has authorized the states to regulate worker health and safety relating to any federal "standard" promulgated under the OSHA act only when the state regulation is "at least as effective" as the OSHA regulation, is not an undue burden on interstate commerce, and is required by "compelling local circumstances." State regulations that are at least as effective as the OSHA warning rule arguably do not burden interstate commerce for the reasons that will be discussed. A state, however, may have a difficult time justifying such regulation as being compelled by a local need. To meet this requirement, the state would have to establish that local industries covered by the rule pose health dangers to local workers and that the federal rule provides insufficient protection. Although states can conceivably meet this burden of proof, state regulation cannot be generic, but must be tied to specific factual situations which justify a broader rule. If the OSHA claim of preemption is correct, the rule will eliminate any state regulations that give employees access to trade secrets, or that give access to other persons under conditions different from the OSHA rule.

The advantages and disadvantages of these various regulatory schemes have been vigorously debated. The arguments concern two issues. First, should there be direct disclosure to workers or is indirect disclosure sufficient? Second, in either case, what terms and conditions concerning disclosure are appropriate?

If an unorganized worker must hire a health professional in order to learn the identity of a substance, most will be discouraged from doing so. One problem is that without prior access to the information, the employee cannot determine whether purchasing health professional services is worth the cost. A second problem is that the services might be too expensive, especially if preparation of the written request for the information is burdensome or an appeal to

424. See infra note 497 (announcement by OSHA administrator).
426. See infra notes 492 to 499 and accompanying text.
427. See infra text accompanying notes 500 to 513 (questioning legality of preemption).
428. See supra note 59 (disclosure infeasible because value of information is reduced).
OSHA is necessary to obtain the information. By comparison, if unions hire health professionals on a retainer basis, the need to determine the value of access to the information before it is purchased can be avoided. Moreover, since the cost of hiring health professionals would be spread over the entire membership, the problem of the high cost of acquiring the information would be less discouraging. Therefore, if disclosure is indirect, only employees who are members of labor unions are likely to take advantage of access to trade secret identities.

Even if employees were given the identity of chemicals directly, they likely would require professional assistance in order to evaluate the information. The mere possession of chemical identity, therefore, may be of limited use in assisting the employees in bargaining individually for ex ante compensation. Nevertheless, some information would be available to workers through libraries and public health agencies. Further, independent researchers might be assisted if workers had the identity of chemicals to which they were exposed. Finally, the information would be useful for purposes of medical treatment and obtaining ex post compensation if workers became ill. Direct disclosure prior to illness would eliminate the necessity of attempts to obtain the identity after an illness occurs and would therefore speed both treatment and compensation.

Employers have argued, however, that direct disclosure would make it more likely that trade secrets would be disclosed without authorization. Under the Carter administration, OSHA balanced this concern against the workers’ need to know the information and concluded that “the public health interest in access prevails.” For two reasons, the agency discounted the danger to employers of unauthorized disclosure. First, all important information such as manufacturing processes and the composition of chemicals in the processes would remain secret. Second, employees may be required to sign confidentiality agreements, and the agency noted that such agreements have generally worked well to protect trade secrets.

In promulgating the hazard communication rule, the Reagan administration OSHA accepted the employers’ arguments. First, the agency concluded that indirect disclosure adequately protected workers. Second, the agency was concerned that some employees who were not employed by the owner of a trade secret would receive trade secret information. The agency noted that firms that manufacture chemicals would be required under a direct disclosure rule to divulge the identity of chemicals to the employees of firms that use those chemicals. The agency thought that the lack of control by the owner of the trade secret over employees who would be given the information would make unauthorized disclosure more likely and would make it more difficult to find the culprit.

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429. See supra text accompanying notes 403 to 415 (discussing hazard warning rule).
434. Id.
The Reagan administration OSHA may have overestimated the danger that there would be unauthorized disclosure of trade secrets. There apparently was no evidence in the hazard communication rulemaking record of an employee’s disclosing a trade secret to a competitor. Moreover, any manufacturer can obtain a court order to prevent the use of a trade secret by a competitor who knowingly acquires the information without authorization.

Ultimately, the rulemakers’ difficulty in choosing between direct and indirect disclosure is tied to their inability to predict whether direct disclosure poses a significantly higher danger that trade secrets will be divulged to competitors. Some experimentation with each method would be useful. The attempt by OSHA to preempt inconsistent state laws will significantly limit any such experimentation by forcing states to adopt only rules requiring indirect disclosure. Moreover, OSHA should have adopted a disclosure policy that would allow consideration of the danger of disclosure based on the particular situation. Disclosure should be required or prohibited on an industry-by-industry basis as the facts warrant. In some industries, especially those that are not unionized, the need for direct disclosure may be especially compelling. Moreover, the danger of unauthorized disclosure in particular industries may be slight. For example, the trade secret may involve only a limited number of employees, or only those employees who are directly employed by the owner of the trade secret. A flexible rule would give OSHA more discretion to accumulate evidence concerning the advantages and disadvantages of direct disclosure and to offer greater protection to workers in appropriate circumstances.

The question of what conditions should be required for disclosure also poses issues that are difficult to evaluate. The Carter administration OSHA allowed employers and manufacturers to require only that individuals seeking information sign a confidentiality agreement, and liquidated damages provisions were prohibited. The Reagan administration OSHA has required that the health professional seeking access to trade secrets meet four conditions and sign a confidentiality agreement, which can include liquidated damages provisions, before such access is allowed. The agency has set itself up as a “referee” between health professionals and employers and manufacturers to prevent misuse of the terms and conditions of disclosure by employers who wish to avoid divulging their trade secrets.

While the appeal mechanism provided by the Reagan administration rule is a useful attempt to deter intransigence on the part of employers and manufacturers, employers and manufacturers are likely to try to avoid disclosure. Except in certain competitive situations, employers and manufacturers have a clear incentive to refuse to accede to requests for chemical identity. As a

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436. 1 R. MILGRAM, MILGRAM ON TRADE SECRETS §§ 5.04, 7.08 (1983).
437. See supra text accompanying notes 416 to 418 (discussing records access rule and proposed modifications).
438. See supra text accompanying notes 403 to 415 (discussing hazard communication rule).
440. See supra text accompanying notes 49 to 52 (discussing employer incentives to keep health information confidential); see 48 Fed. Reg. 53,280, 53,315 (1983) (excessive denial of information on unsubstantiated trade secret grounds has been a significant problem to date).
result, employers and manufacturers can be expected to argue that an applicant has not met the various conditions for disclosure and to force an appeal to OSHA. Although the employer or manufacturer faces a possible fine if it loses an appeal, the $1000 fine for each violation is unlikely to have a significant deterrent effect. Further, since claims concerning trade secrets could likely be made in good faith, the increased sanctions for willful violations would pose little threat. Finally, if OSHA orders disclosure, a company can be expected to seek judicial review and to obtain a protective order for the identity of its chemical until the matter is resolved.

Labor unions have argued that liquidated damages provisions will also be used by employers and manufacturers to attempt to deter individuals from seeking access to trade secret identities. Health professionals will agree to such damage provisions only if they can purchase insurance against their potential losses. No health professional will purchase the insurance unless income from the services rendered exceeds the cost of the insurance. Health professionals who seldom seek disclosure of this type of information may therefore be discouraged from obtaining insurance. Health professionals who work for unions or who have grants to study the information are unlikely to be deterred, however, unless the amount of liquidated damages being demanded results in excessive insurance premiums.

The advantage of the Carter administration's approach is that once it has been determined that requiring disclosure of the identity of a substance is legal, employers and manufacturers will be unable to refuse to comply with requests for chemical identities. This approach, however, may not sufficiently protect the confidentiality of the information. The Reagan administration, on the other hand, has offered employers and manufacturers more protection by requiring disclosure only under certain terms and conditions, but it has thereby invited intransigence and delay. These more detailed procedures will undoubtedly limit the amount of information available. The current OSHA policy imposes the burden of establishing the need for disclosure and the unreasonableness of any demand for liquidated damages on the individual seeking disclosure. One reform that might discourage employer exploitation of this approach would be to shift the burden of proof on those issues to the trade secret owner.

Legality of Disclosure. There are significant statutory and constitutional questions concerning the legality of requiring disclosure of trade secrets. One statutory issue is whether OSHA or a similar agency is authorized to divulge trade secret information. Another issue is whether OSHA can preempt state regulation in the area of hazard communication and, if so, to what extent. A constitutional issue is whether the disclosure of trade secrets constitutes a taking of property without just compensation in violation of the fifth amendment. Each of these questions is considered below.

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441. See supra note 415 (sanctions for violation of OSHA rule).
443. See supra text accompanying notes 435 to 436 (arguing that Reagan administration OSHA may have overestimated danger of unauthorized disclosure of trade secrets).
Statutory Limitations. The federal Trade Secrets Act establishes criminal penalties for any disclosure by federal employees "not authorized by law [of] any information . . . which . . . concerns or relates to trade secrets . . . ."\textsuperscript{444} Most states have similar provisions.\textsuperscript{445} Certain federal and state agencies have been "authorized by law" to disclose proprietary information concerning toxic materials, but OSHA was granted no such specific authorization.

In \textit{Chrysler Corp. v. Brown},\textsuperscript{448} the Supreme Court considered the circumstances in which an agency was authorized to release proprietary information without a specific legislative grant of authority. The Court held that the release under the Freedom of Information Act (FOIA) of information submitted to the Defense Department by the Chrysler Motor Company could be enjoined if the disclosure was not "Authorized by law" in a manner that satisfied the Trade Secrets Act.\textsuperscript{449} To satisfy this requirement, there had to be "a nexus between the [disclosure] regulations and some delegation of the requisite legislative authority by Congress."\textsuperscript{450}

In \textit{Louisiana Chemical Association v. Bingham},\textsuperscript{451} a federal district court affirmed OSHA's exposure and medical records access rules, rejecting an argument that OSHA had violated the Trade Secrets Act as interpreted by \textit{Chrysler}.\textsuperscript{452} The district court reasoned that because OSHA's enabling act authorized the agency's residual rulemaking powers, the disclosure of any trade secrets under an agency rule would be "Authorized by law" as required by the Trade Secrets Act.\textsuperscript{453} The court, however, misunderstood the \textit{Chrysler} opinion.

\textsuperscript{444} 18 U.S.C. § 1905 (1982). Since the Trade Secrets Act applies only to disclosure of trade secrets by government officials, it is unclear whether the Act proscribes agency action compelling disclosure of information directly to third parties. On the one hand, it can be argued that circumvention of the Act should not be allowed by disclosure to third parties. \textit{Cf.} International Union of Elec., Radio and Machine Workers v. NLRB, 648 F.2d 18, 27 (D.C. Cir. 1980) (NLRB could not order employers to disclose copies of discrimination complaints filed with the EEOC when the EEOC could not itself disclose the information). On the other hand, it can be argued that the Act was intended only to protect the confidentiality of information held by the government and is therefore silent on the circumstances in which the government can order that trade secrets be disclosed directly to third parties.

\textsuperscript{445} \textit{See supra} notes 293 to 305 and accompanying text (discussing state statutes).

\textsuperscript{446} The Toxic Substances Control Act (TSCA), which regulates the manufacture and sale of toxic substances, also requires that dangerous substances be "marked with or accompanied by clear and adequate warnings." 15 U.S.C. § 2605 (a)(3) (1982).

\textsuperscript{447} \textit{See supra} notes 419 to 423 and accompanying text (discussing state statutes concerning disclosure of trade secrets).

\textsuperscript{448} 441 U.S. 281 (1979).

\textsuperscript{449} \textit{Id.} at 318. Section 10 of the Administrative Procedure Act provides that a reviewing court shall "hold unlawful and set aside agency action . . . not in accordance with law." 5 U.S.C. § 706(2)(A) (1982). The Court reasoned that "any disclosure that violates the Trade Secrets Act is not in accordance with law" within the meaning of the \textit{APA}.

\textsuperscript{450} 441 U.S. at 310-11. The government had argued that the release of Chrysler's information was authorized by 5 U.S.C. § 301 (1982), which empowers an executive department to "prescribe regulations" for the "the custody, use and preservation of its records . . . ." The Court concluded that Congress intended the provision to be used only for "procedural" and not "substantive" rules such as the release of proprietary information. 441 U.S. at 310-11.

\textsuperscript{451} 550 F. Supp 1136 (W.D. La. 1982).

\textsuperscript{452} \textit{Id.} at 1143.

\textsuperscript{453} \textit{Id.} at 1144. The district court also held that forced disclosure of proprietary information was permitted under OSHA's authority to order employers to make available to the agency any records necessary or appropriate to determine the causes and prevention of occupational hazards. \textit{Id.} at 1140. \textit{See} 29 U.S.C. § 657(c)(1) (1982). Even assuming that this section authorized disclosure of information to employees, which it does not, the Court in \textit{Chrysler} rejected the argument that "any federal statute
The *Chrysler* Court required that the release of proprietary information "reasonably be within the contemplation of the grant of authority" cited for release of the information.\(^{454}\) Thus, the issue the *Louisiana Chemical* court should have addressed was whether Congress could be said to have contemplated that OSHA would disclose trade secrets as part of the exercise of its residual rulemaking powers.

A possible indication of congressional intent can be drawn from the OSHA statute. OSHA is specifically authorized to disclose trade secrets to other government agencies or in other relevant proceedings under appropriate protective orders.\(^{455}\) That Congress felt it necessary to give OSHA specific authority to divulge trade secret information in these instances suggests that Congress intended the Trade Secrets Act to prevent the release of such information in the absence of such a specific exemption. If Congress intended OSHA to have the authority to divulge trade secrets under its residual rulemaking powers, there would have been no need for Congress to create any exceptions to the Trade Secrets Act.

The enabling act contains other sections that implicitly support OSHA's authority to order disclosure of trade secrets, however. OSHA is authorized to promulgate rules for occupational health matters by "innovative methods," by exploration of "ways to discover latent diseases," and by establishing "causal connections between disease and work in environmental conditions."\(^{456}\) Since knowing the identity of a hazard is crucial to the discovery of occupational disease, OSHA's information disclosure regulations could be the type of "innovative" effort Congress intended the agency to use. If this interpretation is correct, Congress authorized OSHA to disclose trade secrets under both the statutory exceptions and the agency's residual rulemaking authority.

Assuming that OSHA lacks the authority to disclose trade secrets under its residual rulemaking power, the agency may still be able to disclose information by demonstrating that it is not a trade secret. The Trade Secrets Act covers information that "concerns or relates to the trade secrets, processes, operations, style of work or apparatus . . . of any person . . .,"\(^{457}\) but neither that act nor the OSHA trade secrets provision\(^{458}\) gives any indication of what constitutes a trade secret. Agencies and courts that have considered the issue have usually adopted the *Restatement of Torts* definition. The *Restatement* defines a trade secret as "any formula, patterns, device or compilation of information which is used in one's business and which gives him an advantage over competitors who do not know or use it."\(^{459}\)

Courts have not uniformly followed the *Restatement* definition, however. In

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454. 441 U.S. at 306 (emphasis in original).
Public Citizens Health Research Group v. FDA,\textsuperscript{460} the United States Court of Appeals for the District of Columbia Circuit defined a trade secret for purposes of the FOIA as any "commercially valuable plan, formula, process or device that is used for the making, preparing, compounding or processing of trade commodities and that can be said to be the end product of either innovation or substantial effort."\textsuperscript{461} The court thought that the "Restatement definition, tailored as it is to protecting business from breaches of contract and confidences by departing employees and others under fiduciary obligations, is ill-suited to the public law context in which the FOIA determinations must be made."\textsuperscript{462} In the public law context, the court found that the "interests of the public in disclosure and the protection of innovation incentives pose important considerations which the common law definition was not designed to handle."\textsuperscript{463} The court noted that none of the courts that had adopted the Restatement definition had critically considered its propriety in light of this distinction.\textsuperscript{464}

The scope of the FOIA provision and of the Trade Secrets Act are coextensive.\textsuperscript{465} As a result, Public Citizens Health Research Group may become influential in defining trade secrets for OSHA's purposes and may thereby affect the scope of OSHA's authority to order disclosures. Both chemical identity and exposure data are likely to qualify for trade secret protection under the Restatement definition. Companies can assert that knowing the identity of chemicals used in manufacturing a product could be useful to competitors, especially when the product is not patentable or is no longer under patent protection.\textsuperscript{466} Similarly, disclosure of exposure information could reveal the identity of ingredients, the nature of a manufacturing process, or the degree of technological accomplishment of a firm.\textsuperscript{467} Under these circumstances, chemical identity and exposure information give the owner "an advantage over competitors who do not know or use it."\textsuperscript{468} Under the Public Citizens Health Research Group definition, however, only chemical identity is likely to qualify for trade secret protection. Chemical identity will qualify for protection as a "formula . . . used for the making of trade commodities" if it "can be said to be the end product of either innovation or substantial effort." Since exposure data is unlikely to be "used for the making of trade commodities," it is most likely the type of health and safety information for which the Public Citizens Health Research Group court refused to provide trade secret protection.\textsuperscript{469}
OSHA's authority to disclose proprietary information may be quite limited. The identity of chemicals will be protected unless the courts are willing to hold that OSHA has the authority to disclose trade secrets. Exposure records could be disclosed if courts are willing to adopt the Public Citizens Health Research Group definition of a trade secret instead of the Restatement definition.

Constitutional Limitations. Companies have challenged regulations requiring disclosure of chemical identities that they consider to be trade secrets on the ground that such regulations are an unconstitutional taking of property without just compensation. These constitutional challenges raise two questions: whether the identity of a chemical is property for constitutional purposes, and if so, whether its forced disclosure must be compensated.

Several federal courts have treated trade secrets as property for purposes of constitutional protection. In Zotos International, Inc. v. Kennedy, for example, a federal district court held that the identity of the ingredients of Zotos' cosmetics was property for purposes of due process protection. Similarly, in Amchem Products, Inc. v. Costle, the court held that health and safety testing information submitted to the Environmental Protection Agency with an application for a license to sell a pesticide was property subject to the protection of the fifth amendment. In light of these decisions, it is likely that chemical identity would be considered property for fifth amendment purposes.

Reductions in the value of an individual's property that result from state laws and regulations that are "reasonable" exercises of a state's police powers do not require compensation. Similarly, the federal government can use its

that the "fundamental need" of workers to know the identity of harmful substances outweighed the harm caused by disclosure because the extent of such harm should be minimal. Preamble to Records Access Rule, supra note 381, at 35,239. OSHA believed that companies would not suffer serious financial reverses because information concerning manufacturing processes and the percentage of a chemical substance in a mixture would remain confidential and because employers could condition access to information on the signing of confidentiality pledges. Id. Industry argued that such pledges would not be sufficient to prevent information from being leaked to competitors, but OSHA dismissed this claim on the ground that contracts of this type are currently being successfully used to protect proprietary information. Id. at 35,239-40.

470. U.S. CONST. amend. V.
472. Id. at 273.
474. Id. at 199, accord Monsanto Co. v. EPA, 13 ENVTL. L. REP. (ENVTL. L. INST.) 20,561 (E.D. Mo. 1983). In City of Oakland v. Oakland Raiders, the California Supreme Court considered whether Oakland could condemn a privately owned football team and force it to remain in that city. 32 Cal. 3d 60, 69-70, 646 P.2d 835, 840, 183 Cal. Rptr. 673, 679. The court found that the federal constitution does not distinguish between "property which is real or personal, tangible or intangible." 32 Cal. 3d at 69, 646 P.2d at 840, 183 Cal. Rptr. at 678.
475. Those courts that have found that trade secret information is not property have done so in a context that is not applicable to the forced disclosure of chemical identity. Several courts have held that pesticide health and safety information is not entitled to constitutional protection because it is generated and submitted voluntarily to obtain the benefits of a federal license. Mobay Chem. Corp. v. Gorsuch, 682 F.2d 419, 423 (3d Cir.), cert. denied, 103 S. Ct. 343 (1982); Chevron Chem. Co. v. Costle, 641 F.2d 104, 114-15 (3d Cir.), cert. denied, 452 U.S. 961 (1981). In the case of the forced disclosure of chemical identity, employers cannot choose to avoid compliance and do not receive an economic benefit conferred by a license in return for disclosure of the information.

476. See, e.g., Goldblatt v. Hempstead, 369 U.S.590, 594-96 (1961) (ordinance prohibiting excavation not shown to be unreasonable; upheld as valid exercise of police power); Hadacheck v. Sebastian, 259 U.S. 394, 411 (1915) (ordinance prohibiting operation of brickyard within city limits upheld because not arbitrary or unjustly discriminatory); Ropico, Inc. v. City of New York, 425 F. Supp. 970, 977
commerce power to “impair the value of property without compensation in the promotion of interstate commerce” up to the point at which regulation becomes “so onerous as to constitute a taking.” To determine whether a regulation is “reasonable” or “onerous,” state and federal courts usually use a balancing test that weighs the public benefit against the private harm. The Supreme Court has indicated that the degree of private harm must be determined on a case-by-case basis, but the Court has offered some guidelines concerning the factors it will consider: whether the “interference with property can be characterized as a physical invasion of government;” whether and to what degree the regulation has “interfered with distinct investment-backed expectations;” and whether the regulation amounts to “the denial of one traditional property right” out of “a full bundle of property rights.”

Several cases have applied these tests to the disclosure of chemical identities. Pesticide registrants have argued that the provision of the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) that allows the Environmental Protection Agency to disclose test data submitted on behalf of a pesticide registration constitutes a taking of property without just compensation. These arguments have been both rejected and accepted by federal district courts. In Petrolite Corp. v. EPA, the district court upheld the disclosure provision after applying the three-part test outlined above. The court concluded that the statute could be upheld because the interference was not a physical taking of the property, it did not remove all of the economic value of the information because the Act did offer some compensation, and the registrant should not have expected that the information would remain confidential because it was prepared in order to obtain a government license. By comparison, the district court in Monsanto Co. v. EPA held that the information was very valuable to the company, the disclosure of the information was unnecessary because it was EPA’s responsibility to protect the public, and the


480. 7 U.S.C. § 136h(d) (1982); cf. McGarity & Shapiro, supra note 459, at 874-75 (describing statutory provisions for compensation of registrants whose information is disclosed).

481. Petrolite Corp. v. EPA, 11 ENVTL. L. REP. (ENVTNL. L. INST.) 20,751 (D.D.C. 1981) (memorandum opinion). Other courts have held that a pesticide registrant does not have any property interest in the testing data. As a result, any claim for compensation would have to fail. See supra note 475 (discussing Mobay Chem. Co. and Chevron Chem. Co.).


484. Id. at 20,753.

485. Id.

provisions for compensation of the company were "arbitrary and vague." 487

The usefulness and importance of disclosure of chemical identity has been previously documented. Even if the Monsanto court is correct that disclosure of testing information is unnecessary to protect the public, 488 the same conclusion should not apply to disclosure of the identity of chemicals that are workplace hazards. Without authority to order disclosure, OSHA would be unable to protect workers.

Moreover, application of the factors the Supreme Court has used to measure private harm suggests that in this situation no taking has occurred. First, disclosure here does not constitute a physical invasion of the property. Second, because of the existence of extensive government regulation, the diminution of "investment-backed expectations" should be minimal. Further, although there is no compensation for disclosure, disclosure will occur under procedures that are intended to minimize the risk of unauthorized communication of the information. While some controversy exists concerning methods of protection, 489 adequate safeguards make it unlikely that information will be leaked to competitors. In the event that chemical identity does become public, there still may not be a significant private harm. Courts have usually held that no taking has occurred unless the property no longer has substantial value to the owner. 490 In many cases the investment of a property owner in chemical identity would continue to have substantial value after disclosure of the identity because it would be protected by a patent or by the existence of good will. 491

Third, disclosure of chemical identity would interfere only with the right to exclusive use of the information, and an owner would retain all other property rights, including use of the information for its own purposes. As long as the confidentiality procedures for disclosure of trade secret chemical identities are adequate, the regulations should withstand an attack on the ground that they constitute an unconstitutional taking of property.

**Federalism Limitations.** One of the grounds upon which OSHA justified its hazard communication rule 492 was that most manufacturing industries are subject to numerous and potentially conflicting regulations resulting from the "proliferation of state and local hazard communication laws." 493 OSHA explained the need for the rule by stating that the various state regulations cover different lists of substances, have different reporting requirements, serve differ-

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487. *Id.* at 20,569.
488. A strong argument can be made the conclusion was in error. See McGarity & Shapiro, *supra* note 459, at 40-45 (arguing Monsanto incorrectly decided).
489. See *supra* text accompanying notes 430 to 436 (discussing disagreement between Carter administration OSHA and Reagan administration OSHA concerning danger of disclosure of trade secrets).
493. *Id.* at 53,283.
ent purposes, have different labeling and material safety data sheet requirements, and have different educational and training requirements.\textsuperscript{494} OSHA noted that the "potential for conflicting or cumulatively burdensome state and local laws has been acknowledged by industry representatives to be immense."\textsuperscript{495} As a result, OSHA declared that its disclosure rule was "intended to address comprehensively the issue of evaluating and communicating chemical hazards to employees in the manufacturing sector and to preempt any state law pertaining to this subject."\textsuperscript{496}

OSHA's decision can be challenged on two legal grounds. One challenge is that it is arbitrary and capricious because it concerns all aspects of hazard regulation instead of only those that pose burdens on interstate commerce and because it preempts all regulation instead of only state coverage of manufacturing industries.\textsuperscript{497} Another challenge is that OSHA lacks the statutory authority to engage in preemption, either expressly or implicitly.

OSHA's concern about the burden of conflicting state regulation is valid up to a point. Most employers look to the manufacturer of the chemicals they use for the information needed to satisfy disclosure requirements.\textsuperscript{498} Standardized requirements concerning the format and nature of disclosure would undoubtedly ease the burden on manufacturers who engage in interstate commerce. Moreover, employers who operate in more than one state could make a standardized disclosure to all employees exposed to the same chemicals. Thus, for items like the relationship of labels and material safety data sheets, the content of material safety data sheets, and the nature of education and training, a standardized requirement is unobjectionable.

OSHA's concern about conflicting state laws is not valid, however, when it is directed toward regulations that give workers more information than OSHA's own regulations require. First, policy judgments concerning how much information should be disclosed involve difficult choices about which the states and OSHA could legitimately disagree. These judgments concern such issues as how many chemicals should be covered, to whom trade secrets should be disclosed, and under what conditions such disclosures should be made.\textsuperscript{499} Second, state requirements that a manufacturer provide additional information are less burdensome than requirements concerning the format and nature of the disclosure. For example, a state requirement that an employer provide information about a chemical that is not within the OSHA regulation is easily satisfied. The employers can provide the information using the same format and method as under the OSHA rule. Differences concerning the person to whom trade secret identities are to be disclosed and the conditions of that disclosure are even less burdensome. If disclosure is to be made to employees instead of to health professionals, the local employer can easily adjust. Since any confiden-

\begin{footnotes}
\footnote{494. Id. at 53,284.}
\footnote{495. Id.}
\footnote{496. Id. at 53,340.}
\footnote{497. 5 U.S.C. § 706(2)(a) (1982).}
\footnote{498. See id. at 53,306. (recognizing manufacturers have best access to information regarding their chemicals).}
\footnote{499. See supra note 328.}
\end{footnotes}
tiality agreement would have to be locally arranged anyway, the terms and conditions of each contract would have to be different in different states.

OSHA's announcement that it has preempted state hazard communications regulation "in all occupational settings"500 is inconsistent with the text of its rule, which appears to limit the preemption to state regulation of manufacturing industries.501 If OSHA pursues its broader claim, a court should find it to be patently unreasonable for OSHA to preempt all state regulation, including that for service and other nonmanufacturing industries, and then to regulate only manufacturing industries. OSHA's explanation for limiting its regulation to manufacturing industries was that most of the cases of occupational disease occurred there and that OSHA was starting its regulation of hazard communications where it would do the most good. Although OSHA's choice to promulgate a regulation limited to manufacturing industries may have been rational, this explanation fails to explain why state regulation of other areas must be preempted.

OSHA has statutory authority to preempt state regulations only if the hazard communication rule can be considered a health and safety "standard."502 As indicated earlier, it is doubtful whether the regulation of information constitutes such a standard.503 The only case which has addressed this issue held that this kind of regulation was not a standard, but it may be possible to distinguish the case as not being applicable to the regulation of hazard communications.504 If the OSHA rule is not considered a standard, there is still a question whether state regulation is implicitly preempted. OSHA seemed to have that intention when it established preemption in its rule, an act that would be unnecessary if the statutory preemption provision applied.

In Pacific Gas and Electric Co. v. State Energy Resources Conservation and Development Commission,505 a recent case involving a conflict between federal and state regulation of nuclear power plants, the Supreme Court held that a state is implicitly preempted from regulating whenever federal regulation is "so pervasive" as to create an inference that state action is precluded or whenever the federal interest is "so dominant" that it can be assumed that there is no room for state legislation.506 The Court also indicated that a state is preempted from regulation when its legislation conflicts with federal efforts either because compliance with both types of regulation is a "physical impossibility" or because state law is an "obstacle" to the "execution of the full purposes and objectives of Congress."507

In Pacific Gas the Supreme Court reaffirmed its position that the "historic police powers of the States were not to be superseded by the Federal Act unless

503. See supra text accompanying notes 330 to 343 (discussing whether OSHA disclosure regulations can be considered "standards").
504. Id.
505. 103 S. Ct. 1713 (1983).
506. Id. at 1722; see Wiggins, Federalism Balancing and the Burger Court: California's Nuclear Law as a Preemption Case Study, 13 U.C.D. L. Rev. 27, 30-34 (1979) (explanation of preemption precedent).
507. Pacific Gas, 103 S. Ct. at 1722; see Wiggins, supra note 506, at 42-56 (explanation of preemption precedent).
that was the clear and manifest purpose of Congress." 508 Under the Pacific Gas principles, no clear congressional intent to preempt can be inferred from the OSHA statute. Congress obviously envisioned a system of dual enforcement. It sanctioned state regulation in excess of federal standards in appropriate circumstances. 509 Congress also stated that one of the purposes of the OSHA Act was to provide healthier and safer workplaces "by encouraging the States to assume the fullest responsibility for the administration and enforcement of their occupational health and safety laws by providing grants to the States to assist" their efforts. 510 Moreover, unlike federal regulation of nuclear power generation, OSHA regulation does not necessarily cover all of the firms which are potentially subject to regulation. Instead of enacting an all-encompassing scheme of regulation, Congress gave OSHA the burden of establishing the need for regulation before the agency can regulate a specific industry. 511 In addition, state regulation cannot be said to be an "obstacle" to federal purposes. 512 The purpose of the OSHA Act is to "assure as far as possible that every working man and woman . . . have . . . safe and healthful working conditions . . . " 513 The Act is not intended to protect American industry from potentially burdensome state regulation. As long as the purpose of state regulation is to disclose additional information to workers, it is not inimical to the purposes of the OSHA act. Finally, OSHA and state regulation can coexist without physical impossibility. If the state requires the disclosure of additional information, additional signs or material safety data sheets can be distributed without disturbing any federal requirements.

C. NLRB REGULATION

Collective bargaining agreement provisions concerning the disclosure of information can take the form of any of the various current or proposed regulatory arrangements, with the attendant advantages and disadvantages of each. The scope of disclosure will depend on the strength of the union and its will-

508. Pacific Gas, 103 S. Ct. at 1723 (quoting Rice v. Santa Fe Elevator Corp., 331 U.S. 218, 230 (1947)). Normally, the Court has found express preemption only when Congress has spoken in unambiguous terms. Wiggins, supra note 506, at 43. In cases where parties have argued that preemption is implied, the Court has been reluctant to intrude on a state's ability to regulate unless the implication is quite strong. See New York Dep't of Social Servs. v. Dublino, 413 U.S. 405, 415 (1973) (mere complexity of a legislative scheme does not imply that preemption was intended if, given the complexity of a matter addressed by Congress, a detailed legislative scheme would be both likely and appropriate). Moreover, the Court has limited the number of areas which are so intrinsically federal, like foreign affairs, that preemption has to be implied. Wiggins, supra note 506, at 34.


511. See Industrial Union Dep't v. American Petroleum Inst., 448 U.S. 607, 652 (1980) (before it may regulate, OSHA must show that significant hazard exists, and that its regulation will reduce risk from that hazard), construing 29 U.S.C. § 55(b)(5) (standard promulgated shall be that which "most adequately assures, to the extent feasible, on the basis of the best available evidence" that no material impairment occur to employees, even with regular exposure to hazard).

512. For cases of preemption based on conflict as an obstacle to a federal purpose, the Supreme Court has required that Congress have intended to impose a uniform set of national standards. See Ray v. Atlantic Richfield Co., 435 U.S. 151, 163-68 (1978) (Washington law requiring stricter ship safety requirements preempted by federal law intended to establish uniform national standards).

ingness to make information disclosure an important part of its representa-
tional efforts. In the past, unions have not always been diligent about pressing
such issues.514

Under the National Labor Relations Act, an employer must provide the
union with information relevant or necessary to the union's role as exclusive
bargaining representative.515 Before 1979 the NLRB and federal courts of ap-
peals only occasionally refused to order employers to turn over admittedly rel-
vant information.516 Employers could not avoid disclosing information by
claiming that the information being sought by the union was confidential.

Matters changed, however, when in Detroit Edison Co. v. NLRB,517 the
Supreme Court held that in evaluating a union's request for relevant informa-
tion, the Board must balance the employer's "legitimate and substantial" inter-
est in secrecy with the union's interest in having the information.518 In that
case, the Court reversed a Board order that the employer provide the union
with copies of aptitude test questions and answers and employee test scores
because of the employer's overriding interest in maintaining test validity and
in preserving employee expectations of privacy. Since Detroit Edison, em-ply-
ers have apparently met with more success in asserting claims of confiden-
tiality, sensitivity, or privilege in response to requests for information.519

Oil Chemical & Atomic Workers Local 6-418 v. NLRB,520 a recent case
which consolidated for review three NLRB decisions, raised the issue of the
application of Detroit Edison to occupational health information. In two of
these cases, the union requested the generic names of all substances used by
the employers and health information on past and present employees.521 In the
third case the union sought a list of the generic and trade names of all chemi-
cals handled by union members.522 The employers resisted, raising defenses of
the lack of relevance of the information, confidentiality of the medical records,

514. See supra text accompanying notes 87 to 102 (discussing failure of unions to make employee
health a major issue in collective bargaining).

515. This duty applies to the union's role both in negotiating collective bargaining agreements, see
generally NLRB v. Truitt Mfg. Co., 351 U.S. 149 (1956), and in administering an agreement already in
effect, see generally NLRB v. Acme Indus. Co., 385 U.S. 432 (1967). Failure to provide relevant informa-
tion constitutes a violation of sections 8(a)(5) and 8(a)(1) of the Act.

516. See generally R. GORMAN, BASIC TEXT ON LABOR LAW, UNIONIZATION, AND COLLECTIVE
BARGAINING ch. 20, §§ 4-5 at 409-18 (1976) (discussing pre-1976 employer disclosure cases); J.
O'REILLY & G. SIMON, UNIONS' RIGHT TO COMPANY INFORMATION (1980) (discussing legislative, ju-
dicial, and agency requirements for employer disclosures).

517. 440 U.S. 301 (1979).

518. Id. at 315.

519. New Jersey Bell Tel. Co. v. NLRB, 720 F.2d 789, 791-92 (3d Cir. 1983), denying enforcement to
265 N.L.R.B. No. 180 (Dec. 16, 1982) (no violation when employer refused to give union attendance
and tardiness records without employee consent); Johns-Manville Sales Corp., 252 N.L.R.B. 368 (1980)
(no unfair labor practice when employer refused to give union the names of 34 employees whose medi-
cal files had been "red-tagged" because of diagnoses of pneumoconiosis); LaGuardia Hospital, 360
N.L.R.B. 1455 (1982) (employer does not have to reveal patient names in connection with grievance).
See also Memorandum 75-22 of NLRB General Counsel to Field Offices on Supreme Court's Decision
in Detroit Edison Co. v. NLRB, 4 LAB. LAW REP. (CCH) ¶ 9189 (June 26, 1981) (outlining expanded
investigation procedure applicable where charged party contends relevant information privileged
against disclosure in form requested).


and the trade secret status of the chemicals used.\textsuperscript{523} In each of the cases the Board found the requested information relevant to the union's role as bargaining representative.\textsuperscript{524} In the two cases in which the union was seeking medical records, the Board rejected the employer's claims that the records were confidential because the union had not sought individually identified records and had agreed that identifying data could be removed from the records.\textsuperscript{525} The Board also found that the employers had failed to substantiate most of their claims of trade secrecy.\textsuperscript{526} The Board therefore ordered the employers to produce the requested information on all substances as to which no claim of trade secrecy could be made. As to any trade secrets, it would seem that the Board should have turned to Detroit Edison to balance the union's need for relevant information with the employers' concerns about secrecy. Instead, however, it ordered the parties to bargain collectively in an attempt to reach some accommodation of their competing interests on their own.\textsuperscript{527}

The United States Court of Appeals for the District of Columbia Circuit enforced the Board's orders in all three cases.\textsuperscript{528} Although the court agreed with the Board's assessment of the relevance of the requested information, it carefully described the factual settings of the requests and thus arguably left room to distinguish future requests on their facts.\textsuperscript{529} The court went on to approve the Board's referral of the trade secret issues to the collective bargaining process. Rejecting the unions' contention that the Board had violated the Act by refusing to decide the issue directly, the court concluded that the Board had acted within its remedial discretion in relying on the longstanding bargaining

\textsuperscript{523} Additional defenses of burdensomeness, costliness and waiver were summarily rejected. Colgate-Palmolive Co., 261 N.L.R.B. at 92-93.

\textsuperscript{524} Minnesota Mining & Mfg. Co., 261 N.L.R.B. at 32; Borden Chem., 261 N.L.R.B. at 65; Colgate-Palmolive Co., 261 N.L.R.B. at 90.

\textsuperscript{525} Minnesota Mining & Mfg. Co., 261 N.L.R.B. at 30-31; Colgate-Palmolive Co., 261 N.L.R.B. at 93. The Board also held that if the supplying of aggregate medical data resulted in the unavoidable identification of some employee names, the union's need for the data outweighed the "minimal" intrusion on employee privacy. Minnesota Mining & Mfg. Co., 261 N.L.R.B. at 31; Colgate-Palmolive Co., 261 N.L.R.B. at 94.

\textsuperscript{526} The Minnesota Mining and Manufacturing Co. patent officer testified that the identities of only five to ten of the 700 different items produced at the plant and only one raw material used there would harm the company if disclosed to a competitor. 261 N.L.R.B. at 31. Similarly, Colgate-Palmolive estimated that of 150 ingredients it uses, only three or four percent could be classified as trade secrets. \textit{Id} at 97.

\textsuperscript{527} Minnesota Mining & Mfg. Co., 261 N.L.R.B. at 32; Borden Chem., 261 N.L.R.B. at 65; Colgate-Palmolive Co., 261 N.L.R.B. at 94-95. The Board claimed it was not shirking its responsibility to resolve the controversy, for it had at least decided that all the requested information was relevant. Minnesota Mining & Mfg. Co., 261 N.L.R.B. at 32 n.26. It maintained that it could not engage in the Detroit Edison balancing analysis until it had afforded the parties a chance to resolve the matter. Minnesota Mining & Mfg. Co., 261 N.L.R.B. at 32; Borden Chem., 261 N.L.R.B. at 65; Colgate-Palmolive Co., 261 N.L.R.B. at 95.

\textsuperscript{528} Oil, Chemical & Atomic Workers Local No. 6-418 v. NLRB, 711 F.2d 348 (D.C. Cir. 1983).

\textsuperscript{529} The court stated:  

In cases like those now before us, where the employees admittedly are exposed to a variety of potential hazards and have expressed growing and legitimate concern over their health and safety, where the unions explained the rationales underlying their requests in considerable detail, and where the pertinent collective bargaining agreements obligate both management and the unions to take specified actions to safeguard employees' health and safety, the relevance of a wide range of information concerning the various elements of the working environment and employees' health experiences cannot be gainsaid.

711 F.2d at 361.
relationship among the three employers and their unions as a first step in resolving the issue. It is likely that the parties will now return to the bargaining table, fail to reach a resolution, and be back before the Board with a second complaint of refusal to provide information. The Board will then have to reach some decision concerning the balancing of interests, and another round of appellate review is sure to follow.

Even if the employers are ultimately required to disclose trade secrets to the unions in these cases, the decision may do little to offset general weaknesses in union bargaining positions. The balancing analysis mandated by *Detroit Edison* creates uncertainty and thus provides a strong incentive for delaying tactics by employers. The Board and the courts will have to develop tests to evaluate employer defenses of confidentiality or secrecy, to define trade secrets under the Act, and to measure the adequacy of procedures designed to protect confidentiality. Each of these tests will have to be developed through litigation of individual cases. Employers who do not wish to disclose chemical identities can be expected to litigate these cases fully. Litigation of a single unfair labor practice charge can take years, and the whole process of defining the application of the Act to disclosure of chemical identities could take decades. In the meantime, employers can resist union requests for chemical identities, leaving unions with only their economic power to compel disclosure.

V. Reform of Information Regulation

Recent interest in the forced disclosure of information concerning occupational disease has produced a complex scheme of laws and regulations and has raised a number of statutory and constitutional issues concerning their legality. Workers in manufacturing industries are protected by OSHA’s hazard warning rule. The millions of workers who are not covered by the hazard warning rule are protected by those state rules which have not been preempted by OSHA, by OSHA’s records access rule if their employer voluntarily maintains exposure or medical records, and by disclosure requirements that are part of the few exposure standards promulgated by OSHA. The agency’s warning rule contains a definition of hazardous chemicals that is narrower than that used by the records access rule. As a consequence, the coverage of the warning rule is limited. A similar restriction on the records access rule has been proposed.

Information disclosure is also limited by restrictions put on the disclosure of trade secrets. OSHA’s warning rule limits disclosure of trade secrets to health professionals with a considerable number of restrictions. The agency’s records access rule orders disclosure to employees of trade secret identities, imposing only the condition that a confidentiality agreement be signed. OSHA, however, has proposed to amend the records access rule to make its provisions concerning disclosure of trade secrets similar to those in the warning rule. State provisions vary, but some states apparently allow direct disclosure to employees under certain circumstances. OSHA has attempted to preempt any direct disclosure requirements in the state laws for manufacturing industries.

For workers in unionized industries, NLRB regulation could offer some

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530. *Id.* at 362.
hope of additional information disclosure. While employers generally are required to provide relevant information to unions, recent decisions have given them grounds for denying access to information they consider confidential. Although unions will probably prevail if they insist on obtaining access to the information under appropriate confidentiality orders, the opportunity for delay by employers is great. The high cost of prolonged litigation may make it difficult if not impossible for some unions to obtain information by this method.

OSHA’s attempts to limit the scope of disclosure regulation, including its preemption of state laws, have been motivated by the agency’s desire to reduce the costs to industry of those regulations. OSHA may have gone too far in this direction. There appear to be significant gaps where workers are unlikely to obtain necessary information or to receive appropriate compensation for occupational illnesses. Additional OSHA regulation should tailor the regulatory response to the danger perceived in a particular industry. Workers should at least be given the identity of any chemical to which they are exposed, unless it is a trade secret. Further obligations should be based on a determination of what is necessary to protect workers. These obligations might include provision of hazard warnings, disclosure of voluntarily kept records, and retention, maintenance, and disclosure of required records. Similarly, decisions about whether there will be direct or indirect disclosure of trade secrets should be based on an assessment of the workers’ need to know the information.

It is possible that a graduated regulatory scheme would involve the same delay OSHA has faced in the promulgation of exposure standards. On the other hand, OSHA should be able to implement this type of regulation without the information about chemical hazards needed to establish an exposure regulation. The standard for requiring regulation of an industry to produce additional information should be the degree of suspicion concerning the possible dangers of its workplaces.

It is also questionable whether OSHA now has the legal authority to order disclosure of information, especially if the information is a trade secret. The OSHA Act appears to give OSHA the necessary authority, but if pending law suits go against the agency, legislation will be necessary to reinstitute many of the aspects of its regulation. Legislation would then probably also be required to achieve the reforms proposed here. OSHA’s ability to regulate information, however, may be limited even if appropriate legislation is enacted. If employers’ claims about the constitutional limitations on such regulation succeed, the ability to regulate information will be significantly limited.

VI. CONCLUSION

A fundamental flaw exists in the way in which labor markets have been regulated in order to prevent occupational disease. Labor markets have failed to produce an efficient distribution of the risk of occupational disease in significant part because of a lack of adequate information about such illnesses. Regulation intended to encourage or require employers to engage in greater preventive efforts has also failed because of the absence of the same information that is missing from the labor markets.
Efforts to reform workers' compensation, tort law, and OSHA regulation have been largely unavailing or counterproductive. Recommendations designed to improve workers' compensation, particularly through the use of presumptions and expert panels to determine difficult issues of causality, remain unadopted. "Reforms" proposed for tort law, if adopted, would effectively reduce the amount of compensation for occupational diseases below the rather meager amount now available. OSHA's attempt to speed its approval process by adoption of a generic cancer policy was dealt a death blow by the Supreme Court's insistence that the agency quantify the extent of the danger posed by each substance on a case by case basis. In addition, difficult questions of costs and benefits continue to slow OSHA decision-making despite the Supreme Court's holding that a cost-benefit decision is unnecessary for adoption of exposure limitations.

The failure to improve regulatory performance in situations where inadequate information exists has generated recent interest in regulations that force employers to disclose information that would be useful to market and regulatory decisions and to scientific research. The disclosures that have been required range from a limited obligation to issue nonspecific warnings about chemical hazards to an extensive obligation to reveal the identities of the substances to which a worker has been exposed, even if they are trade secrets, and the medical records concerning that exposure. These regulations, however, cover only a small number of workers and may be vulnerable to employer claims that they are without statutory authority or violative of constitutional limitations. Nevertheless, they are a start toward resolving the fundamental problem of lack of information.

Two additional reforms should be considered that would reallocate the risk of inadequate information from unprotected workers to the public or employers, although their implementation may not be politically feasible. The first reform would be to increase governmental support for the production of information concerning occupational disease. This would be appropriate because of the public goods characteristics of such information. An analysis of the incentives of the private market for the production of information about occupational disease reveals that neither employers nor, to a lesser extent, labor unions, are likely to demand such information and that individual workers are unable to afford it. Even if employers purchase the information, they are unlikely to make the information public in the absence of regulation, because to do so would involve them in regulatory problems that otherwise could be avoided. If a significant amount of additional information were available, both the market and current regulatory schemes would function more productively.

The second reform would be to require employers to prove the safety of a substance at the planned level of worker exposure before it could be used in a workplace. Drugs and pesticides are currently regulated in this manner. Adoption of this approach would wreak havoc with the country's industrial system, however, since thousands of chemicals are currently in industrial use and hundreds more enter into use each year. Presumably, it was this fact of life that caused Congress and state legislatures to allow the use of substances
until workers or regulatory agencies prove that they are unsafe at current exposure levels.

A more feasible alternative would be to authorize OSHA to require employers to prove the safety of any chemical for which there is sufficient data to suspect that the chemical might be hazardous at current exposure levels. EPA has been given an analogous authority under the Toxic Substances Control Act to regulate the manufacture and shipment of toxic chemicals.\textsuperscript{531} Workers would receive somewhat more protection under such a system because an employer would not be allowed to continue using a suspect chemical unless sufficient information existed to prove that it was safe at current exposure levels. The determination of what evidence is sufficient to require a manufacturer to prove the safety of a substance could involve OSHA in the same time-consuming and controversial litigation in which it presently finds itself. OSHA would be more likely to prevail, however, if it could create a rebuttable presumption that a substance is not safe and thereby shift the burden of proving safety to employers.

A change to even a limited licensing system would produce considerable costs, especially in lost production and delay in implementing new technology that used possibly hazardous substances. Whether the benefits of this reform would exceed the costs is impossible to calculate because the existing data is insufficient to estimate accurately the degree of danger posed by existing chemicals. Nevertheless, the change should be made because it shifts some of the risk of occupational disease from employees to employers and the public that buys their products. This redistribution of risk is in keeping with an American tradition of preferring prevention to \textit{ex post} compensation. This tradition is the basis for the creation of OSHA and for the decision that the agency should protect workers without consideration of whether the benefits of a regulation exceed the costs.

Such a fundamental change in the regulation of labor markets is unlikely to occur unless there is a public scandal resulting from an epidemic of occupational disease. In the meantime, American workers will continue to bear the risk of being exposed to chemicals that may be found to be highly toxic. Interim reforms can help to lessen this danger, but it is unlikely to disappear in the near future. The problem of occupational disease is one of life's risks that workers will continue to bear.

## APPENDIX I

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1. ALA. CODE §§ 25-5-57(4), 58, 68(b), 77(b), 110, 117, 175 (1977).

2. The statute of limitations runs one year from the date of last exposure. Id. § 25-5-117. The time limit for death claims is three years. Id.

3. The statute requires the worker to have been exposed for a minimum of 12 months in the last five years in order to bring a claim. Id. § 25-5-146.


5. ARIZ. REV. STAT. ANN. §§ 23-901.12(c); 901.01, -901.02; 901.03(D); 1041(E); 1045(B)-1061 (1983).

6. Must meet six factors including "direct causal connection." Id. § 23-901.01.

7. Statute of limitations runs after one year from date of injury, or from date when illness should be subject to reasonable discovery. Nelson v. Industrial Comm’n., 120 Ariz. 278, 585 P.2d 887 (Ct. App. 1978).

8. Two years or more for silicon dioxide. ARIZ. REV. STAT. ANN. § 23-901.02 (1983).

9. Findings of expert panel constitute prima facie evidence. Id. § 23-901.03(D).


11. Disability must occur within one year of last exposure for all occupational diseases, except silicosis and asbestosis, for which the period is three years. Id. § 81-1314(a)(7).

12. Death must occur within one year of last exposure, except death following continuous disability which must occur within seven years. Id.

13. Eleventh Circuit. Id. § 34-9-281(c)-(d).

14. Minimum exposure requirements for silica or asbestos dust of not less than five of previous ten years, two of which were in-state unless work was for same employer. Id. § 34-9-333.

15. Death must occur within one year of last exposure, except death following continuous disability which must occur within seven years. Id.
41. Minimum exposure requirements for silica dust of not less than five of previous ten years, two of which were in-state unless work was for same employer. *Id.* § 72-443.

42. Minimum exposure requirements of 60 days for nonacute occupational diseases. *Id.* § 72-439.

43. Disability must occur within one year of last exposure, except for silicosis for which the period is four years. *Id.*

44. Death must occur within one year of last exposure, except death following continuous disability must occur within four years. *Id.*

45. For first year, after which compensation is 60% of the state’s average weekly wage, plus 7% of that figure for each dependent child up to five children. *Id.* § 72-408.

46. 48 ILL. REV. STAT. ch. 48, §§ 138.8(b)(4), .8(f), 172.36(d), .36(f), .41(c), .47 (Supp. 1983-84).

47. The statute of limitations for pneumoconiosis is 5 years after last exposure; for radiation-related diseases it is 25 years after exposure. *Id.* § 172.41(c).

48. Minimum exposure of 60 days required for silicosis or asbestosis. *Id.* § 172.36(d).

49. Disability from silicosis or asbestosis must occur within three years of final exposure. Disability from radiation-related diseases must occur within 25 years of last exposure. *Id.* § 172.36(f).

50. Employee is “conclusively presumed to have been exposed to the hazards of an occupational disease when, for any length of time, however short, he or she is employed in an occupation in which the hazard of the disease exists . . . .” *Id.* § 172.36(d).

51. 22 IND. CODE ANN. §§ 22-3-7-10, -16(d), -20, -32(e), -33(a), -9(f), -16(d), -19(b) (West 1981 & Supp. 1983-84).

52. Minimum exposure of 60 days required for silicosis and asbestosis. *Id.* § 22-3-7-33(a).

53. Disability must occur within two years of last exposure except for disability from silica, coal or asbestos dust, which must occur within three years of last exposure. *Id.* § 22-3-7-9(f).

54. Death must occur within two years of disablement. *Id.* § 22-3-7-9(g).

55. Employee is “conclusively deemed to have been exposed to hazards of an occupational disease when, for any length of time, however short, he or she is employed in an occupation . . . . in which the hazard of the disease exists.” *Id.* § 22-3-7-33(a).

56. Total payment may not exceed $83,000. *Id.* § 22-3-7-19(b).


58. Statute of limitations runs two years from date of injury. *Id.* § 85.26(1).

59. Minimum required exposure to coal dust of five of the last 10 years, two of which were in-state. *Id.* § 85A.13.

60. Disability must occur within one year of last exposure, except for pneumoconiosis, for which the period is three years. *Id.* § 85A.12.

61. Death must occur within one year of last exposure, except for death resulting from pneumoconiosis, for which the period is three years. *Id.* If death follows continuous disability, the period is seven years. *Id.*

62. KAN. STAT. ANN. §§ 44-510c, -516, -5a01(b), -5a01(c), -06, -10, -17 (1981).

63. Minimum exposure requirements for silica dust of five of the last 10 years, two of which were in the state unless work was for the same employer. *Id.* § 44-5a01.

64. Disability must occur within one year of last exposure. *Id.* § 44-5a01(c).

65. Disability must occur within one year of last exposure except for silicosis, for which the period is three years. *Id.* If death follows continuous disability, the period is seven years. *Id.*


67. Five years from last exposure. *Id.* at 342.316(3). For diseases, the period is 25 years. *Id.*


69. Minimum time exposure of one year unless causality is proven by an “overwhelming preponderance of evidence.” *Id.* § 1031.1D.

70. Report of medical examiner is prima facie evidence. *Id.* § 1123.


72. Minimum exposure of 60 days required except for radiation disease for which there is no disability. *Id.* §§ 186, 195.

73. Disability must occur within three years of last exposure, except for asbestos-related diseases. *Id.* §§ 189, 194B.


76. Statute of limitations runs one year from injury. *Id.* § 152-41.

77. 19 MICH. COMP. LAWS §§ 418.351, .355, .401(2)(b), .435, .441 (Supp. 1982).


79. Ordinary diseases of life are compensable “where the diseases follow as an incident of occupational disease, or where the exposure peculiar to the occupation makes the disease an occupational disease hazard.” *Id.* § 176.011(15).


81. Statute of limitations runs two years from date of injury. *Id.* § 71-3-35(1). For latent injury,
measured by date of discovery. Pepsi-Cola Bottling Co. v. Long, 362 So. 2d 182 (Miss. 1978); Struthers Wells-Gulfport, Inc. v. Bradford, 304 So. 2d 645 (Miss. 1974).

85. Payment may not exceed 450 weeks or $50,400.00, whichever is less. Id. § 71-3-17(a).


87. Diseases ordinary to life are compensable "where the diseases follow as an incident of an occupational disease . . . ." Id. § 287.067(1).

88. Statute of limitations runs two years from date of injury or death. Id. § 287.430. For latent injury, measured from date of discovery. Welborn v. Southern Equipment Co., 395 S.W.2d 119 (Mo. 1965).


90. Three years from last day of employment. Id. § 39-72-403(3).

91. For silicosis, the claimant must have been exposed to silicon dust for at least 1,000 workshifts during the eight years immediately prior to the disablement. Id. § 39-72-405(2).

92. Exposure to silicon dioxide dust for at least 1,200 workshifts in employment in state is prima facie evidence of exposure to harmful quantities of the dust. Id. § 39-72-407.

93. Findings constitute prima facie evidence. Id. § 39-72-609.


97. In general, statute runs ninety days after employee has knowledge of the disability, or one year after death. Id. § 617.330. For silicosis, however, the statute runs one year after disability or six months after death. Id. § 617.460.

98. For dust-related diseases, minimum exposure requirement require exposure for not less than three of previous 10 years. Id. § 617.460(4), 470.

99. It is presumed that a lung disease arose out of the employment of a fireman or policeman if, in the 12 months prior to filing the claim, the fireman or policeman underwent a medical examination which failed to reveal any evidence of the disease. Id. § 617.455.

100. Findings of expert panel are "final and binding on the commission." Id. § 616.190, .540.


103. 3 N.M. STAT. ANN. §§ 52-3-10(A)(2), -10(B)(2), -10(B)(4), -33, -42(A), -42(B) (1978).

104. For silicosis and asbestosis, the claim must be filed within one year of "the beginning of disablement of the employee." For radiation injury, the claim must be filed within one year from the time the employee knows of the injury. Id. § 52-3-42(A), -42(B).

105. Minimum exposure requirement for silica or asbestos dust of at least 1,250 workshifts in the state during the last 10 years. Id. § 52-3-10(A)(2).

106. Disability must occur within two years of the last day the employee worked for the employer. Id.

107. Death must occur within one year of the last day the employee worked for the employer, except for silicosis or asbestosis for which the period is two years. Id. § 52-3-10(B)(3), -10(B)(4).


110. Death must occur within five years of contracting the disease. Id. § 40(1).

111. Any exposure to the hazards of harmful dust in this state for a period of sixty days . . . shall be presumed, in the absence of substantial evidence to the contrary, to be an injurious exposure. If the employee was working in one of the other occupations listed in the statute and contracts one of the diseases listed in the statute, "the disease presumptively shall be deemed to have been due to the nature of that employment." Id. § 47.

112. If the employee worked in the same employment for a year prior to his injury, "his average annual earnings shall consist of three hundred times the average daily wage or salary for a six-day worker," or "two hundred and sixty times the average daily wage" for a five-year worker. Id. § 14.


114. Except for those diseases listed on a schedule. Id. § 97-53.

115. Statute of limitations runs two years from date of death or disability, and runs two years from the date radiation diseases reasonably discoverable. Id. § 97-58. For latent injury, the statute is measured from date of discovery. Taylor v. J. P. Stevens & Co., 300 N.C. 94, 102, 265 S.E.2d 144, 149 (1980).

116. For silicosis and asbestosis, minimum exposure requirement of two years during previous ten years. N.C. GEN. STAT. § 97-63.

117. Disability must occur within ten years of last exposure for asbestosis, and within two years for lead poisoning. Id. § 97-58(a).

118. Death must occur within 10 years of last exposure for asbestosis, and within two years for lead poisoning. Id.
119. Report of medical panel is to be accepted as "expert medical testimony" and considered with "all the evidence in the case . . . ." Id. § 97-61.2.
121. Diseases ordinary to life are compensable "where the disease follows as an incident to, and in its inception is caused by a hazard to which an employee is subjected . . . ." Id. § 65-01-02(7)(a).
122. Statute runs one year from date of injury or one year from the date whereby disease found to be reasonably discoverable. Id. § 65-05-01.
123. 41 OHIO REV. CODE ANN. §§ 4123.58, .68, .68(BB), .85 (Page 1980).
124. Except for diseases listed on a schedule. Id. § 4123.68.
125. Statute runs two years from date of disability or death, or within an additional six months after diagnosis. Id. § 4123.85.
127. Statute runs 18 months from last exposure or within 18 months after the symptoms become such that a doctor could reasonably diagnose the disease, whichever is later. Id. § 43.
129. A disease to which an employee "is not ordinarily subjected or exposed . . . ." Id. § 656.802(a).
130. Disability must occur and the claim must be filed within five years after the last exposure, except that the period is 10 years for radiation-related diseases and 40 years for asbestosis. Id. § 656.807(1), .807(3), .807(4).
131. Death must occur and the claim must be filed within five years after the last exposure, except that the period is 10 years for radiation-related diseases and 40 years for asbestosis. Id.
132. 77 PA. STAT. ANN. §§ 1208(a), 1401(a)(2), 1401(c), 1401(d), 1401(f), 1406(a) (Purdon Supp. 1983-84).
134. Minimum exposure requirements for silica, asbestos, or coal dust of not less than two years, in the state, during the previous 10 years. PA. STAT. ANN. § 1401(d).
135. Disability must occur within four years of last employment in occupation where claimant was exposed to the hazard. Id. § 1401(c).
136. Death must occur within four years of last employment in occupation where claimant was exposed to the hazard. Id.
137. "If it be shown that the employee [sic], at or immediately before the date of disability, was employed in any occupation or industry in which the occupational disease is a hazard, it shall be presumed that the employee's occupational disease arose out of and in the course of his employment but this presumption shall not be conclusive." Id. § 1401(f).
138. For silicosis, asbestosis, and pneumoconiosis, there is a maximum of $12,750, plus $75 per month after the maximum payment. Id. § 1401(a)(2).
141. Ordinary diseases of life are compensable where the "disease follows as a complication 'and a natural incident of an occupational disease or . . . [where] there is a constant exposure peculiar to the occupation itself which makes such disease a hazard inherent in such occupation.'" Id. § 42-11-10(4).
142. Disability must occur within one year from last exposure, except for radiation injury, for which there is no time limit, pulmonary disease, for which the period is two years, and byssinosis, for which the period is seven years. Id. §§ 42-11-60, -11-70, -13-70.
143. Death must occur within one year from last exposure, except for radiation injury for which there is no time limit, pulmonary disease, for which the period is two years, and byssinosis, for which the period is seven years. Id. §§ 42-11-60, -11-70, -13-70.
144. "The decisions and award in the case shall conform to the findings and conclusions . . . ." of the medical panel, unless it is proven that the conclusions were "due to fraud, undue influence, or mistake of law or material fact." Id. § 42-11-160. In lieu of a medical panel, either party may refer the claimant to a doctor associated with the state medical school, in which case the report is advisory only. Id. §§ 42-11-185.
145. Payment may not exceed 500 weeks. Id. § 42-9-10.
147. Statute runs two years from disablement or death. Id. § 62-8-11.
148. Minimum exposure requirements for silica dust of not less than two years in the state unless work was for the same employer. Id. § 62-8-14.
150. Statute runs one year from beginning of incapacity for work or death, except that the period is three years for coal workers' pneumoconiosis. Id. § 50-6-306. For latent injury, measured from date of discovery. See Norton v. Standard Coosa-Thatcher Co., 203 Tenn. 649, 315 S.W.2d 245, 248 (1958).
151. For pneumoconiosis, additional amounts are provided if the claimant has dependents. TnN.
Code ANN. §§ 50-6-303(b).
152. Tex. Rev. Civ. Stat. Ann. art. 8307, §§ 4(a), 13(g) (Vernon 1967); art. 8306, §§ 10(a), 10(b), 20,
29(c) (Vernon Supp. 1983).
153. Ordinary diseases of life are compensable “where such diseases follow as an incident to an
‘occupational disease’. . . .” Id. § 20.
154. Statute runs six months from injury or “the first distinct manifestation of an occupational
disease.” For good cause, this limit may be waived by the Board. Id. art. 8307, § 4(a). For latent injury,
the statute runs from date of discovery. Borel v. Fibreboard Paper Products Corp., 493 F.2d 1076, (5th
8307, § 13(g).
156. Payment may not exceed 401 weeks. Id. art. 8306, § 10(b). Maximum weekly amounts are
increased at the rate of .7 times the increase in the state average weekly wage in $10 steps. Id. art. 8306
§ 29(c).
158. The disease must “not come from a hazard to which the employee may have had substantial
exposure outside of the employment.” Id. § 35-2-28.
159. Permanent partial disability must occur within two years of last exposure, Id. § 35-2-56(c), ex-
cept for radiation-related diseases, for which the time limit does not apply. Id. § 35-2-56(d).
160. Payments may not exceed 312 weeks. Id. § 35-2-15(1).
162. Must be a disease “to which an employee is not ordinarily subjected or exposed outside of or
away from his employment. . . .” Id. at § 1002.
163. Statute runs one year from “injury.” Id. § 1013.
164. Disability must occur within five years of last exposure. Id. § 1008(a), except for radia-
tion-related diseases, for which the time period does not apply. Id. § 1008(b).
165. Death must occur during employment or, if death follows continuous disability which began
within five years of the last exposure, the death must occur within 12 years of the last exposure. Id.
§ 1008(a). But for radiation-related diseases, the above time limit does not apply. Id. § 1008(b).
167. Diseases ordinary to life are compensable when the diseases follow “as an incident of occupa-
tional disease. . . .” Id. § 65.1-46(1). Also, “[w]hen it is an infectious or contagious disease contracted
in the course of employment in a hospital or sanatorium or public health laboratory.” Id. § 65.1-46(2).
168. Statute runs two years from diagnosis or within five years of last exposure, whichever first oc-
curs. Id. § 65.1-52. For pneumoconiosis and byssinosis, three and two years respectively from diagno-
sis, or five and seven years respectively from last exposure, whichever first occurs. Id. The statute runs
three years from death. Id.
169. Disability must occur within five years of last exposure, except for byssinosis for which the
period is seven years. This limitation does not apply to radiation-related diseases. Id. § 65.1-52.
170. Rebuttable presumption that respiratory or heart disease occurring in policeman or fireman
arose out of occupation. Id. § 65.1-47.
171. Payment may not exceed 500 weeks nor total payment exceed 500 times the state average
weekly wage. Id. § 65.1-54.
173. Disease must arise “naturally and proximately out of employment.” Id. § 51.08.140. For inter-
pretation that disease must be peculiar to the occupation, see Rambeau v. Dept. of Labor and Indus.,
174. Sixty percent if unmarried. Sixty-five percent if married. Additional two percent for each child
up to five children. Id. § 51.08.060.
176. Diseases ordinary to life are compensable where the diseases follow “as an incident of occupa-
tional disease. . . .” Id. § 23-4-1.
177. Statute runs three years after discovery for pneumoconiosis; two years from injury. Id. § 23-4-
15.
178. Minimum exposure requirement for hazards of pneumoconiosis of a continuous period of two
of previous 10 years in state, or five of previous 15 years out of state. Id. § 23-4-1.
180. If loss of employment, payments not to exceed $13,000. Id. § 102.565(1).
182. Statute runs one year from diagnosis or three years from last exposure, whichever occurs first,
except for radiation-related diseases, for which the statute runs only from the date of discovery. Id.
§ 27-12-503(b).
183. Disability must occur within three years of last exposure, except for radiation-related diseases for which the time period does not apply. *Id.*
### APPENDIX II

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<td>7 months</td>
<td>79 months</td>
<td>49 months</td>
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<th>SUBSTANCE</th>
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<th>Cotton Dust Fiber</th>
<th>Cotton Dust in Gins</th>
<th>Asbestos-Rock</th>
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<th>ETO</th>
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<td>9/7434</td>
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<td>18 months</td>
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33. ASARCO, Inc. v. OSHA, 647 F.2d 1, 3 (9th Cir. 1981) (remanded for additional findings on “significant risk”). The court allowed the standard to remain in effect temporarily until OSHA could make the findings required by Indust. Union Dept. v. Am. Petroleum Inst., supra note 25. Id.
37. AFL-CIO v. Marshall, 617 F.2d 398 (5th Cir. 1979) (affirmed standard as it applied to textile industry); see note 25. Id.
39. Id.
42. See 43 Fed. Reg. 45,762, 45,764 (1978) (petition by the Manufacturing Chemists Assoc.).
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<th>SUBSTANCE</th>
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54. Asphalt fumes were originally included in the consensus standard for coal tar pitch volatiles (CTPV). NIOSH recommended a separate standard allowing greater exposure levels. *Id.*


63. EMPLOYMENT HEALTH & SAFETY GUIDE (CCH) ¶ 12,803 (1983).
