

Corporate Corruption of Science

Guest Editors

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Over a Barrel:

Corporate Corruption of Science and Its Effects on Workers and the Environment

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Although occupational and environmental diseases are often viewed as isolated and unique failures of science, the government, or industry to protect the best interest of the public, they are in fact an outcome of a pervasive system of corporate priority setting, decision making, and influence. This system produces disease because political, economic, regulatory and ideological norms prioritize values of wealth and profit over human health and environmental well-being. Science is a key part of this system; there is a substantial tradition of manipulation of evidence, data, and analysis, ultimately designed to maintain favorable conditions for industry at both material and ideological levels. This issue offers examples of how corporations influence science, shows the effects that influence has on environmental and occupational health, and provides evidence of a systemic problem. *Key words:* corporate; science; industry; occupational health; environmental health.

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Occupational and environmental diseases are often viewed as isolated and unique failures of science, the government, or industry to protect the best interest of the public. However, a closer look reveals that far from being an anomaly, occupational and environmental diseases are an outcome of a pervasive system of corporate priority setting, decision making, and influence. In the United States alone in 2002, a total of 139 million workers suffered “5500 fatal work injuries, 4.4 million nonfatal injuries . . . 294,500 illnesses . . . [and] estimates suggest that occupational disease deaths exceed 55,000 per year.”¹ With even

more serious problems in the developing world, the worldwide toll of occupational illness, injury, and death is large. Environmental health-related illnesses and deaths add to the toll. When occupational and environmental health stories make the headlines of the popular press, however, observers are often left with impression that the offending corporation is a “bad apple” in an otherwise healthy barrel.²⁻⁴ As the articles in this issue show, there are simply too many bad apples to blame the problem on individual products, scientists, or even corporations. The problem is with the barrel. In other words, the current economic and political system (both in the United States and in the global context) privileges corporate actors and actually provides incentives for the production of injury and disease rather than its prevention. This metaphorical barrel produces disease because political, economic, regulatory, and ideological norms prioritize values of wealth and profit over human health and environmental well-being.⁵

As we have argued elsewhere,^{6,7} to the extent that science is carried out by and for corporations, it becomes subject to the corporate logic of profit maximization. Milton Friedman’s 1970 directive, that “the [only] social responsibility of business is to increase its profits” describes fairly accurately the standard that drives most corporate behavior today.⁸ The corporation is an entity whose main purpose is to generate profit for its stockholders.^{9,10} The imperative to reduce costs means keeping wages low, minimizing investment in environmentally-friendly technologies, resisting regulation by the state, and failing to implement “voluntary” safety and health standards. In the global economy, the mandate to maximize profit leads corporations into a seemingly unending “race to the bottom,” where transnational corporations shop for the nations with the lowest occupational and environmental standards.¹¹

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Science is important to corporations, public health professionals, and the public. It is the yardstick for measuring the health risks of corporate products and processes, and is depended upon by politicians, consumers, and workers to make decisions about what is a “reasonable” risk to citizens, to themselves, to the environment, and to society at large. Corporations have much at stake when the safety of their products is put to scientific test, and spend hundreds of billions on research each year worldwide.¹² Industry-funded research takes place in a variety of formats and venues, including universities, corporate laboratories, and science-for-hire firms that conduct research for corporate clients. In the United Kingdom, corporations funded £250 million (US\$375 million) of university research in 2001.¹³ In the United States, home to many of the world’s largest corporations and dominant science journals, private commercial funding of university research has expanded drastically over the past decades. This funding grew from \$264 million in 1980 to \$2 billion in 2001, making U.S. universities more dependent on private commercial funding than ever before.¹⁴ The extent of corporate-funded science is troubling because, as the articles in this issue demonstrate, history shows a substantial tradition of manipulation of evidence, data, and analysis, ultimately designed to maintain favorable conditions for industry, at both material and ideological levels.

The articles included in this issue provide both examples and analysis of how corporations influence science and the effects that influence has on environmental and occupational health. The group published here is an eclectic one, in terms of scope, content, and discipline. We have included pieces by historians and sociologists as well as toxicologists and epidemiologists, on the grounds that an in-depth understanding of the impact of corporate interest on science requires investigation from a number of different perspectives.* While many of the articles focus on one particular chemical, process, or corporation, taken together, they provide detailed and often startling evidence of a systemic problem.

Contributor Skip Spitzer, in his paper, “A Systemic Approach to Occupational and Environmental Health,” describes this system as one in which “corporate power and its effects [are] endemic features of national socioeconomic systems and the rapidly integrating global order.” Spitzer is concerned with understanding what he calls an “underlying structure of harm” in order to more effectively organize popular

*Many of the contributors, including one of the editors (DE) have served as expert witnesses in litigation. This is not a coincidence, as many of the articles in this issue would have been impossible to verify without access to corporate documents accessed through the legal discovery process. One of the major advantages of tort litigation is that it is one of the few ways to bring corporate documents into the public domain.

movements for social and economic change. He describes several important features of the system that produces disease and environmental damage, including an unsustainable emphasis on growth, the failure of business competition, and the social and political power of corporations.

One of the most important aspects Spitzer addresses is the fact that corporations “largely ignore social and environmental costs,” chiefly through externalizing them, or shifting costs to governments, neighbors, or workers. As economist Robert Monks has put it, a corporation “tends to be more profitable to the extent it can make other people pay the bills for its impact on society.”¹⁰ For example, when a company emits air and water pollution, it externalizes the cost of that pollution and its attendant health and environmental damages onto individuals and governments who may get sick, be forced to pay for cleanup, or pay for damages in indirect ways (such as fisherpeople who must buy fish because the stream they caught from no longer contains fish). If a company can avoid paying these true costs of the manufacture and use of its products, its profits are enhanced and it has an economic advantage over its more socially responsible or regulated competitors. Since these costs are often large (for example, when applied, such costs have driven many companies into bankruptcy), they provide large incentives for companies to avoid them by influencing the regulatory process or by moving them to the developing (or perhaps more accurately the underdeveloping) world.^{15,16}

While externalities are costs that are not accounted for by the corporation, sometimes human health does appear on the corporate balance sheet. When it does, however, it generally appears appear a cold number, devoid of any value but the economic. Calculations of the “value of a life” are often made at least partly according to the wages that would have been earned by an individual person.^{17, pp.665,660–678} In tort law, for example, economic damages are in large part based on wage loss—a janitor killed by benzene-induced illness would be “worth” less than a CEO killed the same way. This logic operates on the global level as well; Harvard President Lawrence H. Summers, then the World Bank’s chief economist, famously argued in 1991 that “[T]he World Bank [should] be encouraging MORE migration of the dirty industries to the LDCs [less developed countries]” because, among other reasons,

The measurements of the costs of health impairing pollution depends on the foregone earnings from increased morbidity and mortality. From this point of view a given amount of health impairing pollution should be done in the country with the lowest cost, which will be the country with the lowest wages.¹⁸

Aside from encouraging the unequal distribution of risk, the dependence on calculation of the value of the life encourages poor environmental and occupational health

policies across the board. A text by leading U.S. economists points out that “virtually every regulation by EPA [Environmental Protection Agency] and OSHA [Occupational Safety and Health Administration] fails a benefit–cost test” using the value-of-life formula.^{17,p.678} In other words, if the monetary value of life were the only yardstick used to determine the use of safety precautions, even fewer protective regulations would be enacted.

Finally, since the usual penalty for inflicting environmental and/or occupational disease is the “restitution” of the injured through the payment of compensatory fines rather than criminal penalties or confiscatory fines, the costs never approach the economic advantage that accrues to companies that perpetrate these injuries and often completely escape liability. In other words, it can be cheaper to use old, unsafe equipment, kill a worker, and pay OSHA fines (if any) than to install safety equipment to begin with. This is particularly true because it may be less profitable to spend X dollars today on a protective technology or process (and produce no injuries or deaths to be compensated) than to invest the same amount of money in a profit-earning venture (with the expectation that profits will exceed any future compensation cost). This problem is literally compounded by the fact that future compensation costs are discounted to “present value” or the amount of money that if invested today will accrue to the estimated compensation cost.^{17,p.32–34}

The corporate practices of externalization of occupational and environmental cost, assigning monetary values to life, and discounting are countered by social standards for health and safety, embodied in national or international regulation and/or worker and consumer movements. To counter or prevent regulation and citizen movements and maintain their ability to maximize profit, corporations actively engage in the making of public opinion. Science is a powerful tool in affecting social standards, and is often used by industry in hopes of influencing public and regulatory acceptance of a particular industry, process, or product. As the articles in this issue show, when science functions as a tool to affect public opinion or labor or environmental regulation, it does not function as a value-free arena of neutral inquiry, but is subject to influence by the corporate goal of profit maximization. In any case, corporations use several strategies not only in the production of scientific studies that are favorable to them, but also in the communication of those studies to audiences that are important in public decision making, such as lawmakers and juries. While such communication is often not thought of as part of the scientific process per se, it is a key part of the corporate use of science. Corporate strategies in the production of science and the communication of science are interlinked, and are both extremely important to consider in a critical evaluation of the corporate corruption of science.

CORPORATE STRATEGIES FOR THE PRODUCTION OF SCIENCE

By the “production” of science, we mean the processes involved in posing questions and making hypotheses, planning and carrying out studies, drawing conclusions from data, reviewing and analyzing other scientists’ work, and so on. This is essentially the day-to-day work of toxicologists, epidemiologists, physicians, and basic scientists (molecular biologists and others). Corporations may influence scientific production when they run their own development or toxicology laboratories, or when they pay universities or private firms to carry out research for them. This influence can be seen in subtle or overt ways. Sometimes, reasonable, honest, and competent scientists can differ, and corporations will fund, utilize, or depend on the science that is more favorable to their products, often because it seems the most “reasonable” to them. Kjaergard and Als-Neilsen¹⁹ and Als-Neilsen et al.²⁰ found that of scientists conducting randomized clinical trials of therapeutic interventions, those with corporate funding were significantly more likely to favor the intervention than researchers without such funding. As Sheldon Krinsky has shown, universities and university scientists are increasingly involved in venture capital enterprises based on scientific research and development, leaving both institution and individual with deep conflicts of interest.²¹ Sometimes, deeply embedded beliefs about a material’s or an industry’s safety leads to scientific bias.²² Other times, though, scientists and others consciously use faulty science to craft a rationale for a minimum level of health and environmental protections.

Perhaps the easiest way to downplay the negative health impact of a dangerous substance is to simply fail to publish studies that demonstrate that impact. For example, Jock MacColloch, in his “Mining and Mendacity, or How to Keep a Toxic Product in the Marketplace,” shows how the Canadian asbestos industry failed to publish their data that showed Quebec asbestos miners incurred high rates of asbestosis and other health problems. In fact, Canadian asbestos companies publicly claimed for decades that Canadian miners did not suffer from asbestosis. It is the industry’s careful “management of medical knowledge,” writes MacColloch, that “has been the key to the continued use of asbestos.”

Phyllis Mullenix’s “Fluoride Poisoning: A Puzzle with Hidden Pieces,” shows how the fluoride industry, working in concert with the U.S.-funded Manhattan Project, both suppressed and altered studies to maintain the impression that fluoride was safe and beneficial. The studies she reviews have never been publicly discussed before, and offer important data on fluoride toxicity as well as revealing suppression of research. Mullenix focuses on three key sets of data on occupational hazards of inhalation of fluoride particulate or gas, show-

ing how three studies were either suppressed or manipulated to suit the needs of the industry. For example, she details how a study published in the *Journal of the American Dental Association* “haphazardly” assigned workers to control or exposed groups regardless of actual exposure, and blamed worker tooth condition on individual oral hygiene rather than fluoride exposure. The studies Mullenix discusses were never considered in the establishment of a standard for occupational exposure to gaseous or particulate fluoride and fluorine, allowing expanded industrial use of fluoride but resulting in respiratory and lymph node disorders and dental problems for exposed workers.

While McCulloch and Mullenix offer examples of strategies for the manipulation of science within particular industries, these strategies are in fact used again and again to manufacture a clean bill of health for hazardous products. Valerio Gennaro and Lorenzo Tomatis’s “Business Bias: or How Epidemiologic Studies May Underestimate or Fail to Detect Increased Risks of Cancer and Other Diseases” describes a number of strategies corporate-funded epidemiologic studies can use that will “almost invariably lead to negative results.” The authors present 15 strategies, including: the creation of a dilution effect by comparing all workers with an unexposed control group instead of comparing exposed with unexposed workers; failing to control for the healthy-worker effect; considering exposure to only one substance; and failing to build in adequate follow-up periods when studying diseases (such as cancer) with long latency periods.

“Abuse of Epidemiology: Automobile Manufacturers Manufacture a Defense against Asbestos Liability,” by Egilman and Billings, provides a closer look at the research of epidemiologists associated with and funded by the manufacturers of asbestos-containing brakes. This piece explores the various methods researchers have used to show not only that brake mechanics’ exposures to asbestos are “safe,” but that, as is often the case in manipulated research, such exposures actually reduce the risk of contracting the disease the exposure is otherwise known to cause.

CORPORATE STRATEGIES FOR THE COMMUNICATION OF SCIENCE

In order for science to help ensure a favorable climate for corporate profit maximization, it must influence public opinion. Corporate science is often undertaken with an essentially political purpose: to minimize regulation and influence the beliefs of workers, consumers, and jury members.

Regulation at the national level is often the main obstacle to the externalization of corporate profits. The regulatory apparatus can require industry to dispose of waste safely, limit worker exposures to toxins, and ensure that consumer products are safe, among

other things. In the United States, there has been a movement against regulation since at least the mid-1970s. Business interests have successfully argued that regulation costs jobs, stunts innovation, and harms the economy. Using targeted campaign contributions, focused lobbying, and other tactics, U.S. corporations exert considerable influence on the regulatory process. Due to the economic and political power of the United States, this under-regulation puts enormous pressure on other countries to do likewise.

William Kovarik provides an example of how corrupt industry science can influence regulation in his “Ethyl-leaded Gasoline: How a Classic Occupational Disease Became an International Public Health Disaster.” Despite early-20th-century debates over the safety of leaded gasoline and the knowledge of alternative fuels (ethanol), lead industry captains were able to persuade regulators that not only was lead necessary as an anti-knock fuel, but it was safe for the public. Kovarik shows how in the 1920s, corporations such as Ethyl Corporation and General Motors worked to silence the voices of public health officials concerns about lead risks, and hired Dr. Robert Kehoe of the Kettering Laboratory, who argued that lead did not pose a real public health risk. He follows the debate on lead through to the 1970s phase-out of leaded gasoline, which began in the United States in the wake of the emissions standards of the Clean Air Act of 1970 and continues in some parts of the world today.

A current example of corporate influence on science is given in Caroline Snyder’s piece, “The Dirty Work of Promoting ‘Recycling’ of America’s Sewage Sludge,” which shows how industry pressure at one U.S. regulatory agency, the United States Environmental Protection Agency, has resulted in a policy of using toxic municipal sewage sludge containing human and industrial waste as crop fertilizer. The commitment to this policy over more than 30 years has resulted in corrupt science, attacks on policy opponents, and adverse human health reactions, including at least three deaths.

Jennifer Sass’s and Peter Infante’s commentaries on recent butadiene regulation at the U.S. EPA and the U.S. Occupational Safety and Health Administration (OSHA) demonstrate the techniques industry uses to influence regulation, and the success of those techniques in the U.S. regulatory sphere. Sass, in her “Industry Efforts to Weaken EPA’s Classification of the Carcinogenicity of 1,3-Butadiene,” shows problems with industry influence on butadiene scientific panels at both the EPA and the International Agency for Research on Cancer (IARC). At EPA, an industry-heavy science advisory board (SAB) persuaded the EPA to base its estimate of butadiene cancer potency on a weak study that lacked individual exposure data, was likely to have misclassified exposure levels, and counted only deaths from leukemia, not living leukemia cases. At IARC, a vote to classify 1,3-butadiene as a human carcinogen was

reversed in an extraordinary second vote that reclassified the chemical as a “probable human carcinogen.” Peter Infante, in “Safeguarding Scientific Evaluations by Governmental Agencies: Case Study of OSHA and the 1,3-Butadiene Classification,” shows how a similar reclassification took place at OSHA, where, despite clear evidence of elevated rates of lymphohematopoietic cancer due to workplace benzene exposure, the agency declined to pass a more stringent standard on its own, but rather arranged for industry and labor representatives to come to an agreement on the standard. While industry agreed to the OSHA-suggested standard, industry representatives also convinced the agency to downgrade the classification of butadiene to a “probable human carcinogen” rather than a “human carcinogen.” The end result was a classification based on negotiation rather than science; and one that could wrongly assuage workers’ fears and negatively affect workers applying for compensation for lymphohematopoietic cancer.

On an international level, free-trade agreements negotiated through the World Trade Organization (WTO), bilateral agreements such as NAFTA, and the structural adjustment programs imposed on many developing countries by the World Bank and often the International Monetary Fund (IMF) have sometimes militated against national labor and environmental regulation. Free-trade agreements can also mean that national health, safety, and environmental regulations characterized as restrictive of trade can open national governments to expensive suits under agreements such as NAFTA or GATT, which can have a chilling effect on regulation in general.²³ The current export-oriented development model has also meant that there is immense pressure on nations to deregulate; multinational corporations (MNCs) have their pick of nations in which to invest or manufacture, and can choose the nation with the least restrictive rules. A weaker regulatory environment often translates into expanded profit margin, but has not been accompanied by rising standards of living for people in most cases.¹¹ Erika Rosenthal’s contribution to this issue shows how MNCs may also use international agreements to undercut national regulation. Despite the documented occupational health toll of pesticide use in Central America, the pesticide industry has been able to insert language into drafts of both the Central American Customs Union (CACU) and the Central American Free Trade Agreement (CAFTA) that would “harmonize” pesticide laws across the isthmus. If CAFTA and the CACU are enacted, recent strong legislation in Nicaragua will be made meaningless.

While the regulatory apparatus is a key target for corporations interested in defending the safety or healthfulness of their product, industry also works to convince a much larger group of people of the safety of their products. This group includes workers, consumers, and jury members. For workers, the relative safety of the

product is important in making decisions about taking or remaining in a job, the wage they will accept for the job, and whether they will organize and make demands of the company. Consumers, who can be either individuals or companies, may refuse to buy a product if it perceived as unsafe or the most dangerous of several alternatives. Finally, juries have immense power to hold corporations accountable in personal injury lawsuits. Obviously, these groups overlap, and taken together they include most of the public.

Juries, consumers, and workers all come into contact with scientific research in various forms at various times. Workers may receive scientific information from employers in the form of warnings and training materials. Juries must consider scientific material in the course of debates over issues such as causation or the adequacy of product warnings. Individual consumers may receive the least scientific information of these groups, but may encounter warnings (home users of pesticides, for example), or purposefully investigate the effects of particular products. Business consumers receive warnings, manufacturers’ safety data sheets and other scientific information from vendors.

For many jury members, consumers, and workers, however, their opinions on health- and environment-related matters are not formed through the consideration of scientific data or materials per se, but rather through the myriad ways that information is received by them in their day-to-day life. People receive knowledge about health and hazards from a variety of sources. For corporations engaged in the production of harmful substances, using those sources to influence public knowledge is key to maintaining profitability and protecting against legal losses.

The article, “Maximizing Profit and Endangering Health: Corporate Strategies to Avoid Litigation and Regulation,” by Bohme, John Zorabedian, and Egilman, addresses how corporations work with public relations and legal firms work to influence both scientific and public opinion of their hazardous products. The corporations and firms involve a number of secondary actors—such as the media and scientists—in carrying out a strategy designed to maximize profit through minimizing both regulation and legal liability for health problems caused by their products or production.

Michael Jacobson’s “Lifting the Veil of Secrecy from Industry Funding of Nonprofit Health Organizations” shows one way corporate entities spread their message of safety. Many trusted and well-known organizations, such as the American Heart Association, which are widely perceived as providing or disseminating objective scientific information, are substantially supported by corporate groups. Jacobson shows how professional organizations, university research institutes, health charities, and other nonprofit groups that receive corporate funding may be limited or influenced by their corporate sponsors; and how some organizations that

seem independent are in fact created and controlled by industry. We note that this corporate strategy extends to the international sphere: as Nicholas Ashford et al. have shown, the International Commission on Occupational Health, which bills itself as an “international non-governmental professional society whose aims are to foster the scientific progress, knowledge and development of occupational health and safety in all its aspects,” is in fact dominated by multinational corporate interests.^{24,25} ICOH has sought to strengthen its ties with international bodies such as the ILO and the WHO in order to influence international health guidelines and policy, but has failed to be up front about the fact that most of its members represent the interests of industry.

Corporate campaigns to influence public opinion may not address the health effects of a product or process per se, but may work to make that product or process seem indispensable to protect jobs, maintain an adequate standard of living, or achieve some other social or economic good. For example, Raj Patel, Robert Torres, and Peter Rosset’s article, “Genetic Engineering in Agriculture and Corporate Engineering in Public Debate” shows how Monsanto has used a variety of strategies to claim that its products (first pesticides and then genetically-modified foods) are not only safe, but beneficial to both the environment and economic growth, while at the same time foreclosing critiques of these technologies as dangerous and environmentally unsound.

SOLUTIONS

The problem posed by corporate corruption of science is a big one. But there are policy and scientific measures that can be taken to ensure a science that is more interested in protecting human and environmental health than in girding up the profit of multinationals. Many such suggestions are offered by contributors to this issue.

We believe the problems of the corporate corruption of science must be addressed not only at the material level, but at the ideological level as well. To many, corporate power now seems natural and beneficial. The dubbing of economic neoliberalism as “free trade,” for example, sums up a whole set of benefits the economic model is supposed to provide (such as unfettered access to economic growth, a “level playing field” for all actors, an escape from the bureaucracy of the state, and so on), while obscuring the negative social, cultural, and economic aspects of the neoliberal program, which in fact has resulted in increasing inequality both within individual nations and on regional and global levels.^{26,27} In the face of the power of corporate capitalism to define itself in positive terms, we must work on developing a new way of thinking about the role of the corporation in order to build lasting change in science and other arenas.

There are, of course, many examples of citizens’ groups, nongovernmental organizations, and even national governments that are challenging aspects of corporate hegemony. The worldwide movement to contain corporate power and develop economic alternatives to the corporate-driven laissez-faire economy includes many health-focused groups that are doing important work to improve access to health care, address the social roots of ill health, and force companies to take responsibility for the health problems their products can cause during manufacture, use, and disposal.

This work can be further built on by a program for cultural and political change that has at its core the vision and practice of a scientific research that is ethical, well-conducted, and focused on the fostering of occupational and environmental health.[†] The goals of such a program would work to change the way we think about corporate capitalism by:

- holding corporations and corporate-funded scientists accountable for the quality of their work;
- conducting research on key areas in occupational and environmental health that are not being addressed by status quo science;
- developing a broad-based citizen movement to foster scientifically-literate citizen action for healthier workplaces, communities, and natural environments; and
- building a global network to address shared occupational and environmental health harms from both an activist and a scientific perspective.

This is an admittedly broad agenda that has as its goal the mobilization of a populace through the articulation of concerns about corporate-funded science and the presentation of alternatives in a manner that resonates with people’s own concerns, interests, and issues.

Occupational and environmental health offers an ideal platform from which to address wider social and economic inequities on a national and international basis. Many people experience first- or second-hand the serious effects of ill health. Those who are healthy can be moved by an understanding that their health or the health of their children may be at risk. Health is greatly affected by social factors such as racism, income inequality, and human rights, around which some groups are already organized or politicized. Growing awareness of the social roots of ill health holds the potential to mobilize a diverse citizenry over shared

[†]While some would argue that well-conducted science cannot focus on “fostering” anything other than an abstract truth, we disagree. Public health is fostered by well-conducted science that addresses important public health questions; it does not require that science come up with predetermined results, only good results. Currently, many of the most important public health questions are not being asked by science, or their answers are meant to serve the interests of profit rather than health.

concerns, and can contribute to an effective and understandable critique of the inequities of the social, economic, and political system.

This sort of broad agenda for change has been proven successful by the U.S. right wing, which, over the past 30 years or more, has made a concentrated effort to bring U.S. citizens closer to its political ideals. Its success has been due to its ability to frame its agenda in terms that are compelling to everyday people. The right-wing agenda “makes sense” to many people, including those whom it does not materially benefit, because the right has been so successful in influencing the terms of the debate, reaching a broad citizen base, and speaking in a language that appeals to a broad range of people. This did not happen by accident, but was rather the product of a concentrated effort to change the way North Americans think. Ironically, its leaders are aware of and have followed the teachings of Vladimir Ilyich Lenin and the Italian communist philosopher Antonio Gramsci.²⁸ The effort was, to a large extent, executed by the “think tanks” such as Cato, Heritage, and the Manhattan Institute.²⁹

Those of us concerned with occupational and environmental health need to do the same thing. We must build the infrastructure required to develop and articulate a strong vision of a progressive, egalitarian, and people- (rather than corporate-) centered science and politics. We need institutions and coalitions dedicated to the principles elaborated here. Parts of this work are already being done by various groups in the United States and worldwide, but the importance of this program means it deserves a more concentrated focus. Such a focus could be taken on by a coalition of environmental, labor, and public interest groups that already work in a similar vein, but we think it requires the formation of a new organization (or organizations) that would by necessity draw on those groups’ expertise. In short, we call for the creation one or more “think tanks” dedicated to produce and promote the science, the hegemonic constructs, and the infrastructure needed to return science to the production of public and environmental health instead of private profits and human and environmental disease and decay.

Different nations and regions clearly have different political, economic, and cultural realities, but similar efforts are certainly necessary in all parts of a world undergoing rapid global integration. National or regional organizations could work together on shared goals, and coordinate action on the many occupational and environmental health issues that are essentially global in nature (pesticide trade, application, and pollution; emissions and global warming; and labor trafficking, for example).

As the papers in this issue show, the corporate corruption of science is not only widespread, with a long history, but is a real threat to the health and well-being of people and the environment the world over. Such a problem deserves a concerted response on the part of conscientious public health researchers.

References

1. Schulte PA. Characterizing the burden of occupational injury and disease. *J Occup Environ Med.* 2005;47:607-22.
2. Barstow D, Bergman L. At Texas Foundry, an indifference to life. *New York Times.* January 8, 2003.
3. Barstow D, Bergman L. Deaths on the job, slaps on the wrist. *New York Times.* January 10, 2003.
4. Barstow D, Bergman L. Family profits, wrung from blood and sweat. *New York Times.* January 9, 2003.
5. Kortzen David C. *When Corporations Rule the World.* 2nd ed. San Francisco, CA: Berrett-Koehler Publishers, 2001.
6. Egilman DS, Bagley S, Biklen M, Golub AS, Bohme SR. The beryllium “double standard” standard. *Int J Health Serv.* 2003; 33:769-812.
7. Egilman DS. The suppression of science: how corporate interests hide the truth. Center for Science in the Public Interest conference, 2004.
8. Friedman M. The social responsibility of business is to increase its profits. *New York Times Magazine.* September 13, 1970.
9. Monks RAG, Minow N. *Corporate Governance.* Malden, MA: Blackwell Publishers, 2003.
10. Bakan J. *The Corporation.* New York: Free Press, 2004.
11. Millen JV, Holtz TH. Dying for growth, Part I: Transnational corporations and the health of the poor. In: Kim JY, Millen JV, Irwin A, Gershman J (eds). *Dying for Growth: Global Inequality and the Health of the Poor.* Monroe, ME: Common Courage Press, 2000.
12. Organization for Economic Cooperation and Development. Research and development expenditure in industry—Les dépenses en recherche et développement dans l’industrie: 1977/1998. OECD, 2000.
13. Science, Engineering and Technology Statistics. Office of Science and Technology, United Kingdom, June 29, 2005.
14. Washburn J. *University, Inc: The Corporate Corruption of Higher Education.* New York: Basic Books, 2005.
15. Rodney W. *How Europe Underdevelops Africa.* London, England: Bogle-L’Ouveture, 1972.
16. Mitchell L. *Corporate Irresponsibility.* New Haven, CT: Yale University Press, 2001.
17. Viscusi WK, Vernon JM, Harrington JE Jr. *Economics of Regulation and Antitrust.* 3rd ed. Cambridge, MA: MIT Press, 2000.
18. Summers LH. Memo to “Distribution” entitled “GEP.” December 12, 1991.
19. Kjaergard LL, Als-Nielsen B. Association between competing interests and authors’ conclusions: epidemiological study of randomised clinical trials published in the BMJ. *BMJ.* 2002;325:249.
20. Als-Nielsen B, Chen W, Gluud C, Kjaergard LL. Association of funding and conclusions in randomized drug trials: a reflection of treatment effect or adverse events. *JAMA.* 2003;290:921-8.
21. Krinsky S. *Science in the Private Interest.* Lanham, U.K.: Rowman & Littlefield, 2003.
22. Michaels D. Doubt is their product: industry groups are fighting government regulations by formenting scientific uncertainty. *Scientific American.* 2005;292(6).
23. U.S. Department of State. *Methanex Corp. v. United States of America.* <<http://www.state.gov/s/1/c5818.htm>>. 2005.
24. Ashford N, Castelman BI, Frank AL, et al. The International Commission on Occupational Health (ICOH) and Its Influence on International Organizations. *Int J Occup Environ Health.* 2002;8:156-62.
25. International Commission on Occupational Health. About ICOH. International Commission on Occupational Health, July 12, 2005.
26. Kim JY, Millen JV, Irwin A, Gershman J. *Dying for Growth: Global Inequality and the Health of the Poor.* Monroe, ME: Common Courage Press, 2000.
27. UNCTAD. Trade and Development Report, 1997. <<http://www.unctad.org/en/docs/tdr17ove.pdf>>. 2005.
28. Brock D. *Blinded by the Right: The Conscience of an Ex-Conservative.* New York: Three Rivers Press, 2002.
29. Lapham L. Tentacles of rage: the Republican propaganda mill, a brief history. *Harper’s.* 2004:309.