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ABSTRACT

This paper briefly highlights the past four decades of the often contentious relationship between school districts and the environmental movement revealing the difficulties that environmental policy has had on the nation's educational systems. It reveals the public's increasing awareness of environmental factors within the school that jeopardize student health and learning, the policies created to curtail these dangers, and the confusion and waste of resources that resulted when unprepared school districts clumsily attempted to comply with often unrealistic policy mandates. (GR)

# **A Tale of Two Institutions: Education and Environment**

*A brief history of the conflicting values and objectives of  
schools and the environmental movement.*

by

**Bruce Bomier, MPH**

**Fall 1990**

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## **A Tale of Two Institutions: Education and Environment**

*American education administrators have found themselves caught between mismatched perspectives when confronting issues of environmental policy, whether for asbestos or radon, lead in water or underground storage tanks. It is important for them to calmly step back and gain a perspective on the current status of their relationship to the environmental movement.*

Over the years, the men and women who have been entrusted with governance over the nation's schools have learned to deal with a wide spectrum of concerns, some of which have been far removed from "education" per se. School administrators of a hundred years ago had to confront the realities of cholera and typhus; those of the Fifties had to deal with both the phobia and reality of polio and other diseases; to some extent, administrators of the Sixties and early Seventies had to face the issues of developmental disability; and today, school administrators are becoming inundated with issues of the environment, a responsibility that will escalate into the 21st Century. This entwining of education and environment has sometimes been difficult and painful for those managing schools.

As educational systems evolved in the last 40 years, and as environmental sensitivity and understanding progressed, there has been a general inability of the two institutions to work in harmony, and this has cost school districts heavily both in terms of money and stress. The conflict has infringed upon the general comfort and health of students and employees, and has sometimes caused needless panic.

School districts are not staffed to responsibly measure environmental risk on their own. They try to follow regulations as best they can, through their administrators, sometimes with buildings and grounds personnel or, occasionally, through help from a regional service cooperative or state agency. They find it difficult to understand what this new genre' of environmental responsibility involves.

## One Area of Conflict: Asbestos

Within the last year, articles critical of the response to asbestos by schools have appeared in national and local media. A carefully documented article on this issue appeared in early 1990 in *The New England Journal of Medicine* and was quickly followed by a more readable and widely distributed article in *Science Magazine*. The critical theme of these articles was soon picked up and enlarged upon by a range of publications—*Time*, *Newsweek*, *The New York Times*, *NBC*, *American Spectator*, *Forbes*, *Reader's Digest*—addressing one of many instances where two institutions, education and environment, failed when trying to work together.

Speaking on September 7, 1990, regarding schools and national asbestos policy, EPA administrator William Reilly stated, "Many millions of dollars have been wasted on unnecessary asbestos removal operations." Most school asbestos programs were developed to simply achieve technical regulatory compliance; the task was seen as rather like working through a complicated tax form or an application for state matching funds. At one point, many schools concluded that they were required to remove all asbestos in their buildings, while legislative intent was simply to have them rate risk and develop a responsible plan for managing any such risks detected. The schools hired "federally certified" inspectors at the lowest possible price and set into motion a vicious circle of filling out forms and contracting for removal. The insensitivity of schools, politicians and bureaucrats to the importance of risk assessment, and the eventual real risk at which building occupants were placed as a result of the plethora of poorly planned and executed abatement projects, was incomprehensible to public health and environmental risk assessment professionals.

Dr. Robert Sawyer, the physician-engineer who, as a faculty member of Yale, was one of the first to discuss and publish on the issue of exposure of building occupants to background levels of asbestos, considered the "remove all" response of schools to asbestos both unwise and wrong. John Pendergrass, former U.S. Undersecretary of Labor, termed it, "tragic and wasteful." Morton Cohn, Director of Environmental Health at Johns Hopkins Medical School, and B.J. Moseman, of the Pathology Department at the University of Vermont, vigorously criticized in print how schools were dealing with asbestos. In Michigan, John Schwarz, a respected physician and state senator, tried to infuse into legislation a mandated risk assessment prior to abatement of asbestos in schools. This grassroots common sense approach was an honorable attempt to recapture the original public health essence of the law.

What started out to be a reasonable federal asbestos policy, carried out by able regional EPA administrators, in the end created a situation where money was wasted, people were endangered, and education and environment were both poorly served.

### What Went Wrong

The public health/environmental community should not have been surprised. School administrators weren't trained in dose-response of carcinogens or how to rate risk from toxic exposures. They knew how to take low bids from consultants to fill out federal forms, how to raise tax money, how to select a low bid contractor to pull asbestos out of their buildings—but they rarely knew how to monitor such risky construction. As the news media widely reported, the result was often an unwise use of resources and an increase in human risk from poorly executed, "low-bid" removal or abatement projects. Neither of these professional disciplines was to blame; environmentalists and educational professionals just didn't know enough about working together—they answered to different "gods."

To understand the problem, it is necessary to understand the evolution of both environmental science and American education systems over the past 40 years.



# Education and Environment

Institutions that evolved and clashed,  
creating a new dynamic in community service.

EDUCATION	ENVIRONMENT	DECADE
Environmental insensitivity—use of dangerous synthetics in post-war schools.	Emerging awareness of disease as a factor in living in incongruity with surrounding world, especially use of new post-war toxic compounds.	1950 to 1960
Reduction in mandated air exchange while increasing use of synthetic products in school building materials.	Community-wide philosophic acceptance of "Silent Spring" theory; growing scientific evidence of serious disease involving insensitivity to environmental relationships.	1960 to 1970
Sealing up or entombment of school buildings to conserve energy; documentation of degradation of unsafe building materials installed after World War II.	Polarization and "romanticizing" of environmental issues; the focus on wildlife preservation and social issues.	1970 to 1980
Emergence of crude environmental mandates for schools, which are rarely enforced. Focus is on "compliance" with little understanding of its basis or the concept of environmentalism.	Bureaucratic targeting of schools for environmental guidelines; first regulatory confrontation with schools relates to PCBs, Right to Know laws and asbestos.	1980 to 1990
<p>Confusion. Wasted resources. Inappropriate exposures due to misunderstanding of federal asbestos policy. Citations. Criticism of schools and federal regulators in handling environmental policy.</p>		1990 to 2000 and beyond
<p>Hopefully, a blending of realistic environmental policy and sober educational policy that safeguards students and employees and is responsible in terms of cost and benefits.</p>		

# 1950-1960

## EDUCATION

With the baby boom following World War II, school administrators found themselves facing crowded conditions. This meant immediate, rapid (panic) construction, and many schools were built with what was termed, "California construction" methods. Unlike older school buildings which had high ceilings to help dilute airborne contaminants, windows which could be opened or shut easily by teachers, and windows above doors to permit nearly perfect cross ventilation, these new school buildings were like temperature controlled warehouses. They were built of solid brick, with stationary windows and a master thermostat for controlling air exchange. The new engineering was typically unresponsive to the local environment; a school building in the desert in rural New Mexico was identical to one beneath a Long Island turnpike. School districts came as close as they could to producing tight, "economical" buildings, and local building codes further reduced the minimum volume of air exchange required.\*

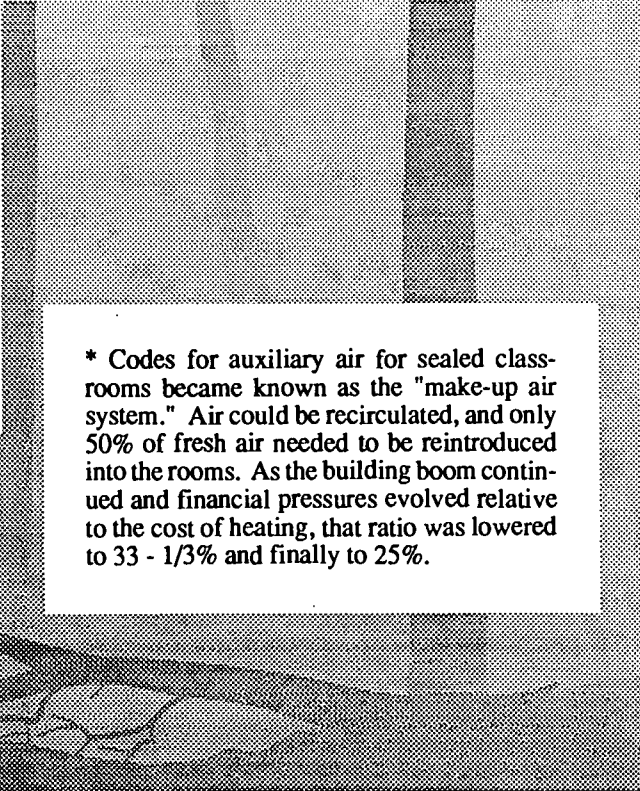
In addition to the change in architecture of school buildings, mass use began of many of the synthetic compounds created during the war to supplement threatened raw materials. Wood, stone and standard insulation were replaced by materials containing formaldehydes, asbestos, benzene and polymer products. These synthetics, new to both the construction industry and to the human immune system, became the materials of choice for these new, tightened buildings.

## ENVIRONMENT

During the 1950s, there began to be a recognition that "something" was happening in terms of public health and synthetic/industrial environmental contamination.

Wilhelm Hueper, a physician with the National Cancer Institute, instinctively began to make projections regarding environmental exposures, disease and society. Although the data was scattered and unorganized, it was easy to see that cancer rates were rising, and fast. To Dr. Hueper, exposing the environment to compounds with no living genetic history of response represented inherent risk to plants, animals and humans. He was eventually silenced by the National Institutes of Health and generally ignored by those making public policy.

A select group of people did, however, listen to and heed Dr. Hueper's warnings. This new breed of men and women scientists would one day be called "environmentalists."



\* Codes for auxiliary air for sealed classrooms became known as the "make-up air system." Air could be recirculated, and only 50% of fresh air needed to be reintroduced into the rooms. As the building boom continued and financial pressures evolved relative to the cost of heating, that ratio was lowered to 33 - 1/3% and finally to 25%.



# 1960-1970

## EDUCATION

"Better living through chemistry," a slogan coined by DuPont Chemical, was a concept adopted by much of society, and the educational community was no exception.

It was unthinkable there could be a dark side to these wonderful new chemicals. DuPont tried desperately to silence Hueper and the feud between the two was dramatic.

School buildings using the California architecture were labeled "entombed buildings" by environmentalists because of the use of synthetics and their sealed architectural orientation. Compounds used in florescent light fixtures, switch boxes and transformers, the polymers and formaldehydes on wallboard and in carpet, along with a variety of other potentially toxic materials, were common throughout schools. Toxic compounds were infused into fine arts and industrial arts departments. New generations of lead and cadmium-based paints could be found in elementary art departments. Instead of using the older methods of fireproofing on load bearing structures, asbestos (a known carcinogen even then) was sprayed onto school structures and mixed into a broad range of school building products, from floor and ceiling tiles to thermal pipe insulation.

Educational systems were, like the rest of the nation, using new compounds at levels that had a limited natural history of human exposure.

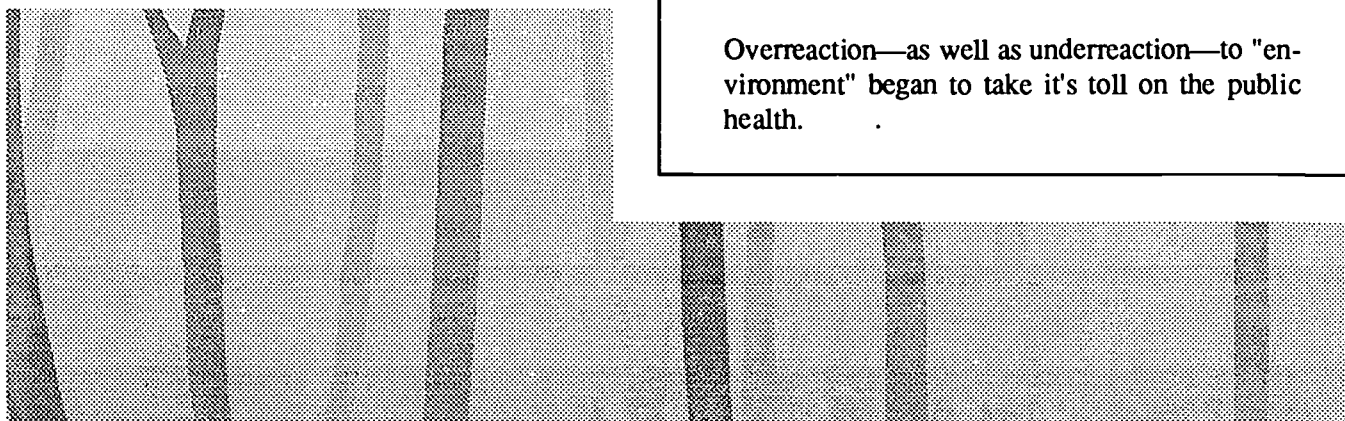
## ENVIRONMENT

Rachel Carson, an oceanographer and poet, and supporter of Dr. Hueper, wrote a book lamenting the indiscriminate use of "new" chemicals in Western society which she felt would result in a worldwide increase in disease. *Silent Spring*, published in 1963, jolted the public, and thoughtful people began questioning the viability of "better living through chemistry." Although her analytical data was shallow by today's standards, Carson produced enough information to effectively indict both the chemical industry for indiscriminantly flushing compounds into the environment and public officials for being too myopic to comprehend what was happening.

There has been a 56% increase in cancer among Americans since *Silent Spring* was published. Much of this increase (some say nearly all) has been attributed to advances in general health condition and health care. Fewer diseases are able to successfully compete to harm a larger population, but cancer incidence has not been significantly reduced by medical science, so cancer looms as a larger, more visible risk. Consequently, fear of cancer came to dominate our sense of well being and began to powerfully influence environmental policy in this decade.

The heightened awareness among scientists which Hueper created in the Fifties was ignited in a more universal way by Rachel Carson in the mid-Sixties. A powerful public outrage grew in intensity, and along with it came the emergence of a new term, "environmentalism."

Overreaction—as well as underreaction—to "environment" began to take it's toll on the public health.





# 1970-1980

## EDUCATION

During this decade, Americans faced the first oil shortage since the Second World War. It became symbolically patriotic and economically prudent to seal up buildings to save on heating fuel. Due to various state and federal programs, the already tight school architecture dedicated itself to enhanced entombment. There were documented incidents of students fainting from lack of oxygen in school assembly rooms, but more common was a set of symptoms that became identified as "sick building syndrome" (lethargy, headaches, dry throat, muscle pain)—building occupants were simply not getting enough fresh air. The correlation between the general discomfort associated with sealed buildings and a drop nationally in academic performance among students was noted by environmentalists but didn't seem to enter the consciousness of school administrators.

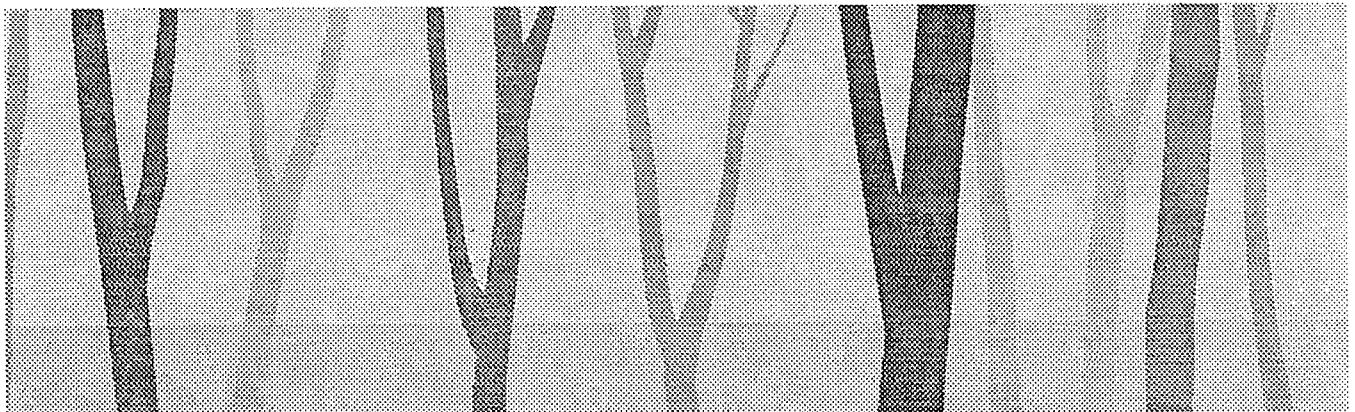
No one was more frustrated by the sick building syndrome than building maintenance staff who were constantly struggling to secure enough "fresh air" to make classrooms comfortable. For them, working with a consistently inadequate air exchange system was like trying to use a hand towel as a blanket—no matter how they adjusted it, the resources were not fundamentally adequate.

There was a constant spiral of fresh air deficit, complaints of physical discomfort, and sometimes illness.

## ENVIRONMENT

The 1970s were a romanticized but tragic period in environmental history. The so-called "green movement" began and environmentalism took on broad, new, heady definitions. Environmentalism became identified with the Vietnam anti-war sentiment. Salient social and aesthetic issues—saving whales and Victorian homes—became blended with causes that sometimes erupted in violent confrontation. The thoughtful scientific lament of Hueper and Carson degenerated into boisterous, radical theater. A corrupted version of the American flag, using a green and white motif, was displayed, usually upside-down, at demonstration sites; stainless steel spikes were driven into redwood trees to injure lumbermen. Proposed environmental legislation was often impractical, sometimes because it was based on scientific illusion, sometimes because it failed to even minimally allow for community costs. Such fantasy regulation became hopelessly confused with initiatives that had a sound and responsible environmental basis. In the backlash that quickly followed, public support for environmental policies degenerated.

Ronald Reagan successfully ran for president against environmentalists, whom he described as "crackpots that want us all living in birds nests." Those responsible for major institutions didn't identify with the "environmentalism" of the 70s. Neither a school purchasing agent's order for lead-based finger paints nor a custodian's direction to an employee to mop up a spill from a capacitor seemed to have anything to do with "environment."



# 1980-1990

## EDUCATION

By now, most schools were teaching environmental science, but school district policy concerning the environment had not progressed. Asbestos had seriously begun to degrade in school buildings and epidemiological reviews implied that the workers most exposed to asbestos in the workplace would likely develop higher rates of asbestos-related cancer. It was generally believed that exposure levels were far from dangerous in terms of dose or exposure, but by any reasonable risk assessment standard, it was felt that the asbestos which surrounded children during their school day should at least be monitored for safety.

At the beginning of the decade, schools were operating with little understanding of risk assessment or risk management. Environment and education were now on a clear collision course.

The first regulation to have an impact on schools involved PCBs, the fire resistant fluid used to insulate much of a school's electrical equipment. This was followed by employee "right-to-know" regulations, requiring availability of technical information on potentially dangerous chemicals to which an employee might be routinely exposed. Then, asbestos identification, risk assessment and risk management regulations evolved. School districts responded by simply finding the easiest path to compliance, usually without any meaningful public health consideration. Having little experience in public health issues, schools read the regulations and followed them to the letter as inexpensively as they could. The asbestos mandate for risk assessment was poorly understood and for many districts became a mandate to remove. Employee right-to-know laws were responded to similarly. Schools began to stockpile technical data sheets on every product in their buildings. It was soon evident that to have a chemical data sheet on each and every toxic compound they used, as was required by statute, was effectively impossible and virtually meaningless, but many tried, at great expense and great frustration. In most districts, a crate of inaccessible and perpetually unused technical information was stored away in some file or cardboard box. Generally, a

clear public health perspective never really found its way into a school's working applications. In a bizarre attempt to comply with right-to-know statutes, one school actually made overheads of their data sheets and then had their employees sit before a screen while hundreds of these highly technical information sheets were flashed before their eyes. It was a matter of form, not function. The same pedantic approach was often applied to asbestos policy, with radon, lead, mercury and infectious agents yet to come.

The lack of wisdom in asbestos policies was pointed out by the popular media long before it became apparent to schools. Most districts had administrators who were skilled in writing contracts to remove asbestos, but only a few had technical support at a level permitting a real understanding of their actual public health options.

The only "risk assessment" done with any frequency was a cursory evaluation of how "friable" the asbestos was, i.e. would it crumble under hand pressure.

Without clear direction but with commendable concern for the safety of students and employees, districts began ordering the mass removal of asbestos. The already shaky financial infrastructure of American schools received a needless broadside as the concept of safety through abatement became institutionalized; worse, as the low-bid mindset prevailed for awarding abatement contracts, needless and dangerous contamination occurred with frequency.



# 1980-1990

## ENVIRONMENT

The EPA chose schools as their first target for regulation because of the often risky environmental conditions within school buildings. Schools have a higher ratio of living tissue with high metabolic rates and potential life years (students) per square foot than any other type of building, so any contaminant entering the ambient air in such buildings would presumably do more damage over time. For diseases with long latency periods, such as those related to asbestos, radon or PCBs, there was a prima facie increase of risk. This, compounded with the lack of fresh air exchange in the generally tightened buildings, properly made schools the number one target for environmental reforms.

What schools weren't ready for was the cast of characters and methods the environmental establishment dropped on them. For PCBs, the protocol for a major spill was senselessly applied to even a minor leak from a florescent light ballast. That law couldn't be complied with or enforced. For asbestos, a different

book of complex engineering controls was dutifully sent out each year by the EPA to each school district in the nation, Year to year, the books were contradictory in specifics and theme, which made little difference since they were virtually never read.

Schools came to understand that environmental regulations were rarely enforced. As one school administrator put it, "they pretend to regulate, we pretend to comply." That stopped in the late 1980s when, inspired by horror stories of increased school contamination through botched abatement, asbestos regulations began to be more strictly adhered to and enforced. When states also began to enforce employee right to know laws, it became apparent to school administrators that compliance could not be achieved or safety maintained simply by keeping a box of inaccessible data sheets in some out-of-the-way fileroom. Planning for a safe environment was correctly moving into the real world of the pragmatic school administrator.

Environmental decisions have moved from the boiler-room to the conference table, and often to the boardroom.

## 1990 and Beyond

Through greater staff awareness or through educational service agencies and other helping groups, school and other building administrators have come to understand the importance of risk assessment and risk management, and that good environmental husbandry goes beyond compliance with regulations. Efficient school districts now conduct risk assessments as a matter of course to determine actual human risk, cost options and the all-around wisest and most ethical procedure. A relationship between regulators and educational professionals regarding environment has become a powerful and decent force. "Environment" has gone beyond the romantic into the practical, and has become an important enterprise for those who govern individuals and institutions.

*Foremost among those who must respond to new environmental challenges will be the men and women who govern the nation's schools. Education and environment must have a firm, clear relationship to effectively safeguard the public health in mutual respect.*

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