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The Hidden Menace
Health Hazards in Our Schools

By John J. Dougan

Newspapers, radio, and television reports offer frequent and alarming proof of the hazards of modern society. Many environmental poisons, such as asbestos, toxic chemicals, mercury, PCB, dioxin, and lead contamination of water and land are widely distributed in industrial nations.

The fact that children spend a large percentage of their time at school underscores the need for vigilance by school boards and administrators to provide a safe, secure environment. The National Committee on School Health Policies states, "The authority which requires pupils to attend school implies the responsibility to provide an environment as evocative as possible of growth, learning and health."[1] Within this context, environment includes school property, location, surroundings; furthermore, it encompassses the physical, mental, and moral hazards facing school children in their daily activities.[2] It includes the hazardous wastes and toxic substances invading the air we breathe, the water we drink, and the earth we walk upon.

We must do our best to protect the young people and employees of our schools from these hazards. In order to do so, we must first be aware of the dangers, and then be prepared to take action when they occur.

Hazards in Drinking Water

When faculty and students of Durham High School in Connecticut complained of "an unusual odor

John Dougan is Associate Loss Control Representative, General Conference Risk Management Services, Washington, D.C.

in the school's drinking water," samples were taken for testing. Tests revealed contamination from the solvents tetrachloroethylene and chloroform. Investigation later determined the most likely source to be an industrial metal-plating plant situated within a few hundred feet of the school water well.[3]

Durham, a small town with a population of 2,200, offers ample proof that rural communities cannot consider themselves immune to groundwater pollution. In fact, rural areas, often lacking the sanitation facilities of larger cities, have numerous septic tanks and cesspools, a source of nitrates, viruses, and microorganisms. Phosphates and other hazardous chemicals that have been dumped down drains are also absorbed into the ground, later to appear in ponds and wells.

While the increased use of pesticides, herbicides, and fertilizers poses an additional threat to well water, perhaps the greatest danger comes from landfills. EPA estimates indicate "as many as 75,000 industrial . . . and 15,000 municipal landfills," into which "a large percentage of the 77,000,000 pounds of hazardous wastes generated each year are dumped." Only 10 percent of this waste has been dumped in an "environmentally sound manner." A 1980 estimate also revealed that "14,000 to 90,000 land-disposal sites were contaminating surface waters and groundwaters."[4]

Another source of water pollution—lead—may appear in new buildings if lead solder has been used in the installation of water pipes. Schools would be wise to have their drinking water tested periodically to reassure themselves of its safety.

What's Under Your School?

In numerous cases, schools have been constructed on or near hazardous waste sites. Love Canal's Ninety-Ninth Street School was located directly on top of a waste dump, while two schools in Billerica, Massachusetts, were built within one-fourth mile of a hazardous waste dump, an asbestos-waste dump, and several waste lagoons.

Whether or not schools can obtain the cooperation of local or state health authorities, they must take action to safeguard their students from potential hazards. Yet school officials and parents who attempt to deal with waste problems often find themselves bogged down by a lack of knowledge about pollution, nonexistent or understaffed government agencies, and resistance from strong corporations.

When state departments of health and environmental safety are not available, The Citizens Clearinghouse for Hazardous Waste is prepared to assist.[5] Created in 1981, this organization helps groups across the country to organize. It offers technical advice, reviews reports and studies, and tells what hazards may be present in various chemicals. Write to them at P.O. Box 926, Arlington, VA 22216 or call (703) 276-7070 for assistance.

What's Inside Your Walls?

Fortunately for schools, urea formaldehyde foam insulation was used primarily in residential construction and repairs. However, some schools may have used it as a shortcut to weatherproofing older buildings. UFFI seemed the answer to the consumer search for an economical means to cut high utility waste. The simplicity of installation—merely drilling a hole and pumping in the UFFI—eliminated the necessity of tearing out interior walls to add insulation. But as the UFFI dried, it produced a gas that caused nausea, headaches, dizziness, respiratory ailments, bloody noses, and eye and skin irritations in some people. Though it is not known whether the product causes more serious side effects in humans, formaldehyde has been shown to cause cancer in animals.[6]

According to the U.S. Consumer Product Safety Commission, aging of the foam decreases the gassing. Although the gassing may continue for years, they assert that if one is "not experiencing any acute health effects, and the foam was installed more than a year ago, it is likely that the formaldehyde levels and health risks, including those of cancer, are greatly reduced."[7] Because of its concern over the safety of UFFI, the Commission banned the product in 1982, only to have the ruling overturned in a federal district court. Nevertheless, the product's poor reputation eventually led to reduced sales, and the end of business.

The demise of UFFI, however, did not bring an end to formaldehyde problems. Particle boards and plywoods that use formaldehyde in their composition are still producing consumer complaints. Manufacturers and regulatory agencies are attempting to improve the baking processes that cure the products.

The Asbestos Crisis

One of the most difficult problems facing educational institutions is asbestos.

Widespread use of asbestos, along with complicated and expensive removal or abatement procedures, has created a nightmare for school officials. Yet this problem cannot be ignored.

Friable asbestos (that which can be crumbled by hand) presents the greatest hazard, since minor disturbance of the material can release miscroscopic fibers that remain airborne for long periods of time. Inhalation can cause asbestosis (a chronic disease of the lungs), mesothelioma (a cancer of the chest and abdominal muscles), and lung

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cancer. Because of the long latency period, these diseases may not show up for 20 to 40 years. Since these fibers remain in the body, each exposure increases the risk of disease.

In 1982, the Environmental Protection Agency issued the Asbestos in Schools Identification and Notification Rule 40CFR.763, requiring schools to "inspect for friable asbestos materials; to notify parents and teachers if such materials are found; and to keep accurate records of their actions to eliminate the problem."[8]

The Environmental Protection Agency allows school asbestos problems to be handled on an individual basis, thereby encouraging the most appropriate correction of the hazard. The action may not always require removal. Other methods of dealing with asbestos include routine inspections to verify that undamaged materials remain undamaged, encapsulation (sealing to prevent release of friable material), and enclosure (the installation of drop ceilings and walls to cover the asbestos).

NOTE: Schools that apply for federal loans or grants without having met the provisions of 40CFR.763 should be prepared to have civil complaints filed against them by the EPA for noncompliance.

Among the exposures that may exist in school environments, the most common examples are pipe and boiler insulation, sprayed and troweled ceilings, rafters and beams, fireproofing, and decorative uses. In addition, students and employees in automotive shops and maintenance areas are exposed during cleaning and repair of brake systems.

The EPA's *Asbestos Fact Book* (August, 1985) provides an excellent source of information, including safe handling procedures. It also lists telephone numbers for Regional Asbestos Coordinators, technical assistance, and grant/loan applications. To obtain information, copies of this book, and the EPA guidance documents, *Guidance for Controlling Asbestos-Containing Materials in Buildings,* call 1-800-424-9065 (554-1404 in Washington, D.C.). The names of laboratories that test and analyze samples for asbestos may be obtained by calling 1-800-334-8571, extension 6471.[9]

Asbestos is not the only pollutant in the air. Other sources of airborne hazards in schools include fiberglass particles in auto body shops, carbon monoxide fumes from auto repair classes, dust from electric sanders in wood shops and school industries, and fumes from flammable liquids, paint sprayers, and stripping compounds. Improperly combined cleaning products can also produce poisonous gases.

Toxic materials are also a problem in art classes, where permanent markers, rubber cement, paints and dyes, clays, and glazes are commonly used. Some of these products contain solvents that can cause skin disease, eye, nose, and throat irritation, and may damage the nervous system.[10]

Up From The Ground

Just as toxic chemicals and hazardous wastes find their way through layers of earth and into our groundwater system, radon, a naturally occurring substance, escapes from the ground and mixes with the atmosphere. In tightly sealed energy-efficient buildings, seeping radon gas that enters through cracks in foundation seams or in basement floors creates a real problem. When trapped in poorly ventilated areas, radon begins to decay and emit radioactive particles. In large concentrations over an extended period of time, exposure can be deadly.

What is most alarming is that radon gas is undetectable without special sampling methods. It has no color, odor, or perceptible physical effects on structures or products it contacts. In addition, radioactive particles drawn into the respiratory tract and lungs cause no visible health deterioration.[11]

Schools may generally be less susceptible to the hazards of radon than the average small, tightly sealed home. The size of school buildings and the frequent traffic through exterior doors should allow for considerable air movement and exchange. However, the lack of information on radon and the potential for health problems creates a potentially hazardous situation that teachers and administrators should know about.

Large quantities of radon have been discovered in Pennsylvania, New Jersey, and New York, and nearly every state has some sources of the gas. The concentration within buildings in the same area may vary widely, so if the community is citing major contamination, the school should consider having its air tested.

In some locations, humans have added to the radon hazard. During the 1950s and 1960s, tailings from uranium mines were given to anyone who wanted to use them as fill dirt. Consequently, many buildings developed excessively high levels of radon gas. By early 1984, the cost of

removing the radioactive dirt from 510 sites, which included schools, offices, churches, and homes, had reached $17.5 million.[12]

To measure radon pollution, two methods are currrently available. Both are simple, relatively inexpensive, and easy to implement. Information may be obtained by writing Terradex Corporation, 460 N. Wiget Lane, Walnut Creek, CA 94598, or Radon Project, University of Pittsburgh, Pittsburgh, PA 15260.

Danger in the Lab

School laboratories cannot exist without a number of basic substances for experimentation. New discoveries about the potential hazards of these substances, however, highlight the need for a thorough investigation of the materials on lab shelves. Schools should regularly evaluate the existing hazards, present and future needs of the lab, safety procedures, and advisability of permanently removing certain substances.

In the interest of health, known carcinogens, such as asbestos, benzene, and benzidine, should be removed from the shelves and properly disposed of by health authorities or a licensed commercial company. Whenever a hazardous chemical is involved, local, state, and federal regulations must be followed in the removal process.[13]

Two government agencies are available to help schools analyze their program and supplies. The NIOSH *Manual of Safety and Health Hazards in the School Science Laboratory* may be obtained by writing to NIOSH Publications Dissemination DSDTT, 4676 Columbia Parkway, Cincinnati, OH 45226. A supplement to this manual is available by writing the U.S. Consumer Product Safety Commission, Washington, DC 20207, or by calling the toll-free hotline 1-800-638-2772 and asking for the booklet *School Science Laboratories, A Guide to Some Hazardous Substances.*

A common, but unsafe, procedure in many school laboratories involves the storage of chemicals alphabetically rather than by chemical compatibility. Improperly stored chemicals can react violently with one another if they come into accidental contact. This can create a major health hazard. In addition, it is important that Material Safety Data Sheets be received with and maintained on all hazardous substances. Data sheets and proper storage techniques are discussed in the U.S. CPSC supplemental guide.

Students handling chemicals must be taught safe procedures. This includes techniques for using chemicals in science labs, proper storage and handling of gasoline and other solvents in shop classes, and wearing of appropriate protective clothing and masks. Age and maturity of the students should be considered when planning experiments.

Keeping on Top

Hazardous materials and toxic chemicals constitute a hidden menace to unsuspecting employees and children. Such pollutants are difficult and expensive to control.

Toxic paint chips are still ingested by children in old buildings, and maintenance workers sanding those buildings inhale the lead-based dust, often oblivious to the menace. PCBs (polychlorinated biphenyls), banned in all but electrical transformers in 1979, were further controlled in 1985, after transformer fires created major PCB contamination. Repeated exposure to either lead or PCBs can be disastrous. Lead can cause irreversible brain damage and death; exposure to PCBs can result in birth defects, tumors, eye and liver damage, and possibly cancer. And these are only a few of the hazards that may be present in our schools!

Maintaining a healthful environment in our schools is not easy. It requires constant vigilance, working closely with local health authorities, and an active school health committee. Although it may sometimes be difficult and expensive, we must make every effort to provide a safe environment for our teachers and students. □

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FOOTNOTES

[1] John J. Hanlon and George E. Picket, *Public Health: Administration and Practice* (St. Louis: Times Mirror/Mosby College Publishing, 1983), p. 426, quoting National Educational Association and American Medical Association, *Suggested School Health Policies* (Washington, D.C., 1966).

[2] *Ibid.*

[3] Samuel S. Epstein, Lester O. Brown, and Carl Pope, *Hazardous Waste in America* (San Francisco: Sierra Club, 1982), p. 84.

[4] *Ibid.*, p. 303.

[5] *Education U.S.A.* (May 27, 1985), p. 299.

[6] Caroline E. Mayer, "Formaldehyde Foam Insulation Ban Ordered," *Washington Post* (February 23, 1982).

[7] U.S. Consumer Product Safety Commission (Washington, D.C.: March, 1982).

[8] Environmental Protection Agency, *Asbestos Fact Book* (Washington, D.C.: August, 1985), pp. 2,3.

[9] *Ibid.*, pp. 2-9.

[10] Leah Y. Latimer, "Toxic Art Materials Studied," *Washington Post* (April 4, 1986), pp. B1, B5.

[11] Mike McClintock, "The Risks of Radon," Home Section, *Washington Post* (February 6, 1986), pp. 5-7.

[12] Mike Edwards, "Colorado Dreaming," *National Geographic* (August, 1984), p. 214.

[13] U.S. Consumer Product Safety Commission, *School Science Laboratories, A Guide to Some Hazardous Substances* (Washington, D.C.: 1984), p. 12.