

The Asbestos Mess

Now, some scientists say removing the fiber can be worse than leaving it.



Far left: Irving Selikoff, in his office recently, examining chest X-rays. His work in the 1960's led to sweeping regulation of the asbestos industry.

Left: Removing asbestos at a Philadelphia school. Inspections have found easily crumbled asbestos in 45,000 school buildings.

"We have no proof that removing asbestos ever saved a life," said Brooke Mossman, below, the principal author of two articles that redefined the health threat posed by asbestos.

BY JOSEPH HOOPER

DR. IRVING J. SELIKOFF is short, he is round, he is old. Normally these attributes combine unprepossessingly in one man, but not in Irving Selikoff. He has the aura of a savant of the previous century, someone who might have been sculptured by Rodin. There is the cane, for one thing, and the fluent French, when that's necessary, and, at the core, the sheer dignifying weight of accomplishment.

Selikoff is America's most prominent researcher in the field of asbestos disease. In the 1960's, he and his colleagues at Mount Sinai Medical School in New York City documented asbestos-related lung disease and cancer among industrial workers. Their findings prompted the Occupational Safety and Health Administration to impose regulations in the 70's limiting worker exposure to asbestos fiber; in the 80's, the Environmental Protection Agency banned asbestos production altogether.

Today, Selikoff, the 75-year-old former director of Mount Sinai's Environmental and Occupational Health Division, continues the research that has taken him to most of America's industrial regions, searching out workers who have been exposed to asbestos and analyzing what now must number hundreds of thousands of chest X-rays. He is a detective of sorts, following a trail of industrial mortality. The mineral

criminal has been exposed; the only thing left to figure out is the magnitude of the crime. Case closed. Selikoff says: "There is no issue, no debate about asbestos."

If only it were so. A fierce controversy has gathered around the question of "in place" asbestos — the millions of tons of asbestos pipe insulation, fireproofing, floor and ceiling tiles, and acoustical plaster that lie embedded in 733,000, or one-fifth, of America's public and commercial buildings.

For most of the last decade, the work of Selikoff and his colleagues pointed to a seemingly unassailable conclusion: Asbestos, a tragedy for industrial workers, posed a grave threat to the general public as well. Countless articles and television programs hammered this simple message home.

In the last year and a half, however, the old certainties have gone out the window. In June 1989, The New England Journal of Medicine published a comprehensive review of recent asbestos research, including a number of Canadian and European studies from the past five years that challenge the conventional thinking about



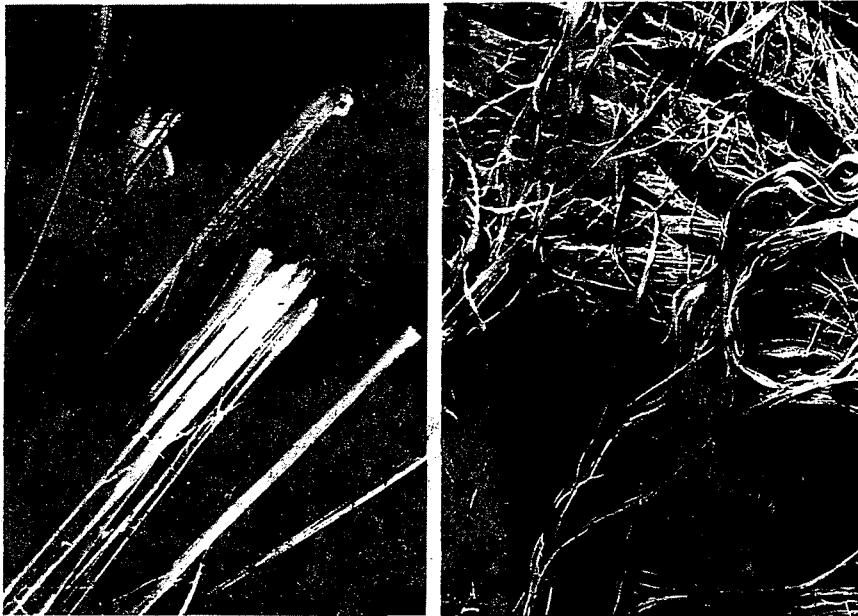
asbestos. The studies undercut the argument that chrysotile asbestos, which accounts for more than 90 percent of all the asbestos in the United States, is a potent environmental carcinogen. Seven months later, a similar article appeared in Science.

The shock waves are still reverberating through the field — colleagues who hold opposing views about the articles often do not speak to each other. Indignant letters from scientists have appeared in both scholarly and popular journals.

The heat has generated a certain amount of light, and not only on the risk posed by asbestos. For the lay public, the controversy has provided a rare glimpse into the workings of American science, and the alliances — holy and unholy — it forms with government, labor and business.

The principal author of both asbestos articles was Dr. Brooke T. Mossman, a 43-year-old research pathologist at the University of Vermont. She and her team of four co-authors argued that the health threat posed by

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UNITED STATES GEOLOGICAL SURVEY

New studies suggest that curly, pliable chrysotile fibers, right, which account for almost all of the asbestos in the United States, are far less dangerous than the needlelike amphiboles, left.

in-place chrysotile asbestos has been grossly overstated, and that the usual solution to the problem — ripping and scraping the asbestos out — is probably more dangerous than the problem itself. Asbestos fibers are harmless unless breathed, and even good removal jobs temporarily raise fiber levels in the air, placing removal workers and, to a lesser extent, building occupants at risk. In the past, the removal industry has compounded the problem by taking a cavalier attitude toward safety.

Mainstream publications found Mossman's revisionist theory irresistible. Spinoff articles appeared in magazines as diverse as *Forbes* and *Reader's Digest*. In a kind of trickle-down effect, the scholarship eventually reached *The National Examiner*, a supermarket tabloid, which announced its interpretation of the findings in a screaming headline: "After spending billions taking it out of our schools, experts discover ... ASBESTOS IS SAFE!"

Asbestos is not safe. But not all types, it now appears, are equally unsafe. This distinction might not have been front-page news except for the money involved. Far-reaching Federal legislation enacted over the last 20 years has stimulated an asbestos-removal industry with annual revenues of about \$3 billion. Yet, according to Mossman, "we have no proof that removing asbestos ever saved a life."

The public now has good reason to be confused. Does a

single asbestos fiber floating in the basement air mean cancer 20 years down the road — and a \$30,000 abatement job next week? Or does it pose less of a threat than cigarette smoke drifting over from the next table? Government officials, too, are perplexed. Will tough inspection laws protect the public or simply make matters worse by promoting unnecessary removals?

At the mention of the Mossman articles, Selikoff gives a look both hurt and accusatory. "Do you have the right to decide how much risk someone else should be exposed to?" he asks sharply. The notion is put forward that perhaps society cannot afford to guarantee complete safety for everybody. "Then say it!" Selikoff explodes. "Don't say to those who are exposed to asbestos, 'You are going to be safe.' Say, 'I can't help you because I don't have the money.'"

THE ATTEMPT TO CONTROL asbestos is a comparatively recent phenomenon, but the mineral itself has always been with us. The Romans wove asbestos into tablecloths that could be tossed into the fire for cleaning. In one of Genghis Khan's northern provinces, Marco Polo saw inhabitants weaving an indestructible cloth out of fibers dug from the earth.

Asbestos commonly refers to six distinct types of silicate minerals, one of which, chrysotile, belongs to the serpentine family, meaning that its fibers are curly and pli-

able; the others, known as amphiboles, all have needlelike fibers.

By the beginning of the 20th century, asbestos's usefulness as a fire retardant and thermal insulator was being exploited on an industrial scale — and over the next several decades, its effects on the lungs of industrial workers became obvious to anyone who cared to look. Asbestosis, an impairment of lung function caused by asbestos scarring, was first diagnosed around the turn of the century. By the 1960's, epidemiological studies, notably those of Irving Selikoff, had established that certain groups of workers — asbestos textile weavers, pipe insulators, shipyard workers — were suffering unusually high rates of cancers. They usually contracted lung cancer or mesothelioma, a cancer of the lining of the lung or the abdominal cavity that was virtually unknown before the turn of the century.

In the 1970's and 80's, the Government took action, through the Occupational Safety and Health Administration and the Environmental Protection Agency. The new regulations were not controversial. Industry bore the cost, and most people regarded the measures as humane and overdue. The seeds of the current turmoil were planted when the scientists at Mount Sinai decided that the evidence warranted an assault on the asbestos already in place.

In the early 1980's, Selikoff testified several times before a Congressional subcommit-

tee that in-place asbestos posed an intolerable health threat to the nation's 15 million schoolchildren. Gregory Lawler, then the subcommittee's chief counsel, recalls: "Half the experts said we needed to do something, half said we didn't." With expert opinion split, Selikoff and Mount Sinai carried the day: In 1986, the subcommittee chairman, Representative James J. Florio of New Jersey (now Governor), won passage of his Asbestos Hazard Emergency Response Act (Ahera) over token opposition.

The act was the first clear signal from the Government that asbestos was believed to pose a serious threat to the general population, not just selected categories of workers. Schoolchildren were a special concern, since most of their schools were built in the 1950's and the 1960's, the heyday of liberal asbestos usage. The Government directed the E.P.A. to compel every school district in the country to inspect for asbestos and, if any was found in deteriorating condition, to draw up plans for remedying the situation.

The remedy could turn out to be prohibitively expensive. Ahera-mandated inspections have turned up friable, or easily crumbled, asbestos in 45,000 of the nation's school buildings. Based on the initial burst of removals, the National School Boards Association has estimated that it will cost \$6 billion to carry out the full Ahera program.

Critics complain that the act declared war on asbestos without telling the soldiers how they were supposed to fight it. The E.P.A. left school districts to the mercy of hired consultants. All too often the result was unnecessary removals. Consequently, the E.P.A. is now reviewing the entire Ahera program.

Even its staunchest advocates will admit that Ahera has had problems, but they contend that doing nothing would result in hundreds, perhaps thousands, of future cancer cases — specifically mesothelioma.

TODAY, WHEN SCIENTISTS talk, or argue, about the risk posed by environmental exposure to asbestos, they are mainly talking about mesothelioma, a fatal tumor that can crush the lungs or push its way out of the torso like some gruesome cinematic special effect. It appears to have struck significant numbers of people who may have had

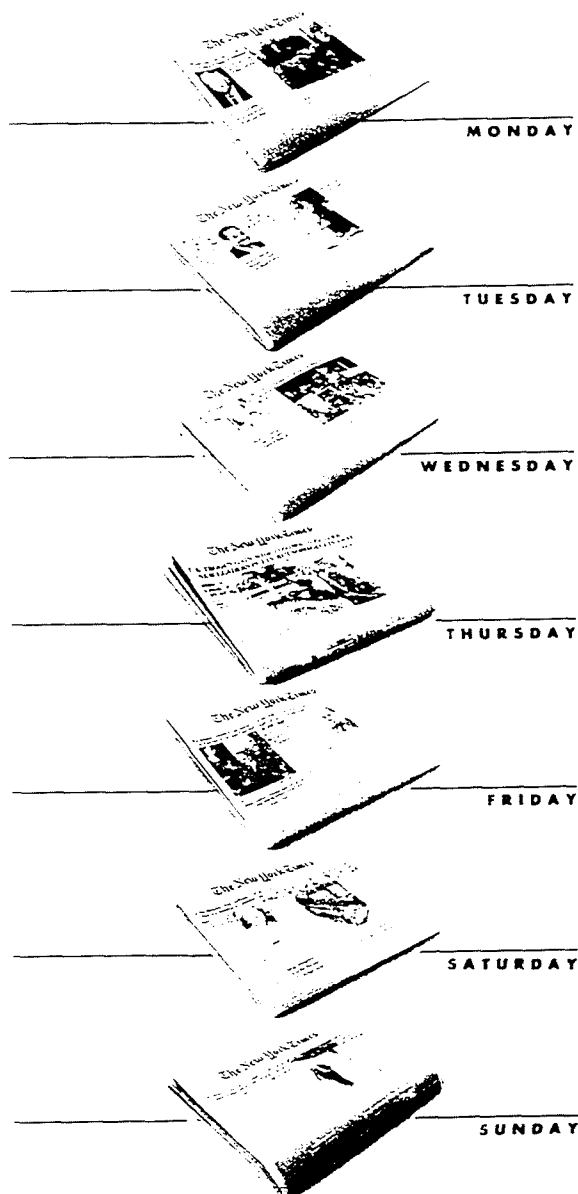
only low-level exposures to asbestos. Asbestosis, on the other hand, requires intensive exposure, rare these days even in industry. Lung cancer, by far the most common cancer among asbestos workers, is still a concern: studies suggest that chrysotile asbestos, the most common type, has induced lung cancer in industrial workers (the vast majority of them smokers) as efficiently as the amphiboles. It is conceivable, therefore, though so far unprovable, that low-level exposure could increase the incidence of lung cancer in smokers. But most experts believe that, for the general public, smokers and nonsmokers alike, this risk pales before the risk of mesothelioma.

Like asbestosis and lung cancer, mesothelioma is thought to follow a dose-response model — the bigger the dose, the more likely the disease. But no reputable scientist has ever arrived at a threshold for safe exposure to asbestos. On the one hand, the risk posed by relatively few fibers would seem to be very low: city dwellers, for example, breathe in thousands of fibers from shedding car brakes. On the other hand, in approximately one-third of the known cases, mesothelioma patients could recall no industrial exposure to asbestos.

Why they should have contracted the disease remains a mystery. However, since asbestos exposure is the only significant cause of mesothelioma, American society had to face the possibility that everyday exposure to an everyday material could kill. In 1960, mesothelioma was killing an estimated two dozen Americans every year; by the 80's, the figure was 1,000 to 3,000 (the estimates vary, because the disease is difficult to diagnose). Some experts were predicting that mesothelioma would overtake lung cancer as a mass killer by the end of the century.

But so far, it hasn't happened. Rates have risen almost exclusively among older men who suffered occupational exposure to asbestos in the days before regulation. But among women, whose asbestos exposure has primarily been environmental, the mesothelioma rate has been flat for the last 20 years. The cancer remains, relatively speaking, rare.

Mossman and her colleagues say they think they know why: recent European studies have convinced them that chrysotile is not very good at causing mesothelioma, even at the highest indus-



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trial concentrations. The lungs wash the fibers out before they can cause serious harm. Only the amphiboles, they say, have been shown to be so highly carcinogenic that we need to worry about them at low-level, environmental concentrations. With the exception of the United States and South Africa, the industrial nations have accepted this so-called "amphibole hypothesis" and regulate chrysotile less stringently.

American public-health scientists usually insist that the jury is still out on chrysotile's ability to cause mesothelioma. Dr. Stephen Levin, a Mount Sinai researcher, points out that the asbestos installed in schools in the 50's and 60's did not begin to deteriorate until a decade later. Since mesothelioma has a 40-year latency period, the epidemiological bad news could still be on its way. "It's like the joke about the man falling out the building," Levin says. "He passes the 15th floor and says, 'So far, so good.'"

But it is unlikely that the near future will bring a dramatic increase in environmental mesotheliomas — otherwise, epidemiologists would already have seen an increase in mesotheliomas with a shorter-than-average latency period. Most public-health advocates object to the Mossman articles not because they find the arguments unreasonable, but out of fear that they will be used as an excuse to ignore completely the problem of in-place asbestos. They often use the term "human experimentation" to describe a policy of doing nothing.

In truth, there are several choices that fall between doing nothing and decreeing a national emergency. Ten months before Congress passed Ahera, New York City enacted the nation's most stringent asbestos regulation, Local Law 76, which mandated removal of asbestos from buildings facing renovation or demolition. Most experts would agree that these abatements are justified — releasing great clouds of asbestos dust during a demolition is no one's idea of public health.

Currently, the city is considering further legislation that would require an asbestos inspection for every building in the five boroughs. This is a dicier proposition, since it envisions more inspections, which critics assume will trigger a host of removals, rarely the safest course. The majority of industrial hygienists now believe that most in-

place asbestos can be maintained or encapsulated in a bonding material or enclosed in an airtight chamber, so that fibers do not reach the air. Even the much-castigated E.P.A. has come out with a new manual for building owners entitled "Managing Asbestos in Place." But building owners generally opt for removal anyway, to defend themselves from lawsuits or to shore up the market value of their property. Even so, Dr. Morton Corn, one of Mossman's co-authors and a former head of OSHA, says he believes that the inspection approach is worth trying — in-place management can't work without inspections to locate the asbestos.

In her two articles, Mossman was less interested in sorting out the policy options than in exposing the absurdity of spending billions on removal. She argues that the nation would get more bang for its public-health buck if it concentrated on such health risks as the passive inhalation of cigarette smoke, which by some estimates is 200 to 400 times more lethal than low-level asbestos exposure.

IF THE MOSSMAN ARTICLES enraged the scientists at Mount Sinai, they did not go down too well, either, with the people and companies who make their living from asbestos. The abatement companies felt threatened, but no more so than the plaintiff attorneys who represent injured workers and building owners in lawsuits against former asbestos manufacturers. They worried that the Mossman pieces would provide legal ammunition for their adversaries in court.

The Mossman articles threaten a network of interests that has grown around asbestos for the last quarter of a century. In 1964, Selikoff's epidemiological study of two insulators' union locals set in motion beneficial changes in the American workplace and, at the same time, a redistribution of wealth, from the pockets of asbestos manufacturers to sick workers and, to a much greater extent, to the lawyers on both sides of the lawsuits. For plaintiff lawyers, Selikoff is both a one-man data bank and a folk hero.

This past February, addressing a legal seminar, Selikoff started playing hardball, casting doubt on the integrity of Mossman and her colleagues. "You should know," he said, "that most of them have been involved with

(Continued on Page 48)

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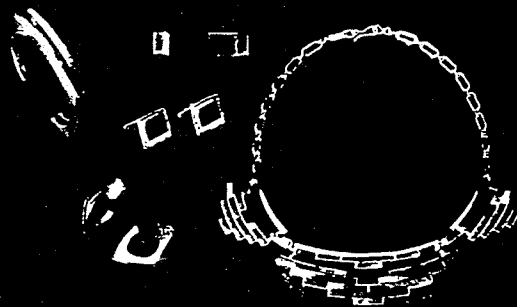
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ASBESTOS

Continued from Page 41

the asbestos manufacturers as medical advisers or consultants or in some similar capacity." The same month, Selikoff's successor at Mount Sinai, Dr. Philip Landrigan, gave a speech at the New York Academy of Sciences that referred to "industry apologists" and "a very highly orchestrated campaign of what the spies would call disinformation."

Given the history of asbestos manufacturing in the United States, terms like "industry consultant" and "apologist" suggest, however loosely, behavior that borders on the criminal. It was scientists sponsored by the industry who, from the 1930's through the 50's, permitted the companies to censor or suppress the results of asbestos experiments. At the Saranac Laboratories in upstate New York, 30 years' worth of industry-financed animal studies simply disappeared from any scientific or corporate record.

In fact, only two of the five authors of the offending articles have any significant connection to the asbestos industry. Dr. Bernard Gee, a professor of medicine at Yale University, and Morton Corn, currently director of the Division of Environmental Health Engineering at Johns Hopkins University, have appeared as paid witnesses in asbestos trials, usually for the defense, but sometimes for the plaintiff. This legal sideline is not unusual in asbestos-research circles, although some scientists stay out of the courtroom to avoid any appearance of compromising their objectivity. For the record, Mossman, who has made her reputation with a steady flow of highly regarded papers on toxicology, has lectured to lawyers on both sides; she has also done some consulting on the toxicology of man-made fibers for two former asbestos manufacturers.

Mossman sounds genuinely bewildered that her motives should be impugned, that her articles should have occasioned rougher rules of the game. Of her decision to jump into the asbestos fray, she says: "I simply felt science wasn't driving public policy."

Mossman's articles undercut the scientific foundations of the asbestos-removal business, which Mossman says

she believes has been raking in profits while claiming to protect the public health. She was shocked, she says, that the Mount Sinai group would regard her writings as an institutional affront. "When I came into this field 15 years ago, Selikoff was like God," she says. "Now my whole perception has changed. I am in an adversary position, and I don't have the political savvy of a Selikoff."

Dr. Arthur Langer serves with Mossman on a panel of scientists commissioned by the E.P.A. to produce a definitive report on in-place asbestos by early next year. Unlike her, he has a combative temperament and a particular reason for enjoying the current dust-up: in 1985, he was let go by Mount Sinai after a 20-year collaboration with Selikoff. "I'm not saying these people were virgins in a whorehouse," Langer says of the Mossman group, "but I don't think they really knew what they were getting into. I said to Brooke, 'You're attacking the icons, the gods themselves.'"

Langer's hot-and-cold mix of outrage and sarcasm might make him science's answer to Lenny Bruce. In the asbestos drama, he plays a Luciferian role. Having been cast out of Mount Sinai, he has since done work on fiber type and mesothelioma at Brooklyn College that the Mossman group has used to buttress its argument. Langer contends it is the Mount Sinai group that is going to hell, taking the path paved with good intentions. "They simply cannot allow certain data to interfere with their public-health policy positions," he says. He describes Selikoff as "a great man" and "a hero, when there was something to be a hero about." But today, he asserts, Mount Sinai's intransigence on the issue of chrysotile—in particular a study by Dr. William Nicholson of Sinai that helped lead the E.P.A. to impose a total ban on all forms of asbestos—will result in a dependence on synthetic fibers whose health effects are no less problematic.

For his part, Nicholson says he isn't sure the total ban on asbestos products was necessary, either. But he rejects the notion that the Mount Sinai researchers have played up the dangers of

(Continued on Page 53)

ASBESTOS

Continued from Page 48

chrysotile out of public-policy paternalism. "That's just balderdash," he says. "I honestly believe what I believe."

SCIENCE HAS ALWAYS been subject to differing interpretations of data; moreover, emotional conviction, ego and turf war are not unknown to it. But the asbestos debate has made one original contribution — dueling conferences. In the past, scientific conferences have usually been forums for the expression of different opinions, but the asbestos partisans have turned them into public relations vehicles, with each side carefully selecting its rosters of speakers to give an appearance of scientific unanimity.

The amphibole hypothesis got its first American airing at the Symposium on Health Aspects of Exposure to Asbestos in Buildings, held at Harvard's Energy and Environmental Policy Center in December 1988. Critics at Mount Sinai and elsewhere were quick to point out that despite the prestigious Harvard name, the symposium had been financed by grants from several real-estate groups and, most damning in their eyes, the Safe Buildings Alliance.

This Orwellian-sounding organization usually sticks to lobbying against asbestos regulation, like New York's proposed inspection law, that might encourage future damage suits against its member companies, all former manufacturers of asbestos products. The Harvard symposium was a more ambitious undertaking, a prestige display case for recent trends in research, all of which happened to suit the Safe Buildings Alliance. The audience heard one speaker after another warning against wide-scale asbestos removal, emphasizing fiber type and size in assessing mesothelioma risk, and noting the low fiber levels being recorded in most public buildings.

The counteroffensive was not long in coming: a conference sponsored by the Collegium Ramazzini. The Collegium, an occupational and environmental health group founded eight years ago by Selikoff and four colleagues, took over the ballroom of the Holiday Inn in midtown Manhattan for three days in June. Stephen Levin of Mount Sinai says that the 70-speaker conference, entitled "The Third

Wave of Asbestos Disease: Exposure to Asbestos in Place," was intended to "address everything the Harvard symposium left out."

Sheldon Samuels, treasurer of the Collegium and an A.F.L.-C.I.O. official, concedes that the Mossman articles "added the heat" to the Collegium's efforts to put on a major asbestos conference. He also portrays the amphibole hypothesis as something other than the product of disinterested thought. "The Harvard symposium, the involvement of the Safe Buildings Alliance — it all stems from the activity of the Canadian Government," he says.

Samuels notes that the Canadian asbestos industry is engaged in scientific research. The industry-financed Asbestos Institute would like to clear chrysotile's name and strengthen Canada's lucrative asbestos export markets in the third world. Its media kit includes brief statements by five prominent scientists, Brooke Mossman among them, objecting to the E.P.A.'s total ban on chrysotile. All were solicited by the Canadian Government, and Samuels sees in this confluence of beliefs the outline of an international conspiracy. "Mossman is nothing," he says. "If the Asbestos Institute decided to find a better scientist, she's out. And the Asbestos Institute would disappear tomorrow if the Canadian Government would change its policy."

In his opening remarks to the scientists, lawyers, judges and abatement-industry executives, Selikoff said, "Science is necessary but not sufficient." That would appear to be so. In the rear of the Holiday Inn's conference hall, two leaders of the White Lung Association, a victims-rights organization, handed out literature. They were flanked by a portable exhibit, "Milestones in the Modern Discovery of Asbestos Disease," featuring photographs of asbestos workers and a brief biography of Selikoff.

By the second day of the conference, a publicity agency hired by Sheldon Samuels was providing reporters with photocopied articles from that morning's papers. A science writer was even commissioned to produce a paperback popularization of the conference proceedings.

The partisan packaging of the conference was impressive. Whether that could be

said of the science depended on what you were looking for. No new evidence was presented to demonstrate that deteriorating asbestos in schools and public buildings was causing increased cancer rates in the general population. However, a mountain of papers were presented that detailed the health effects of asbestos exposure among workers in the construction, sheet-metal and petroleum industries and among school custodians. Though asbestos may well turn out to be a critical public-health problem only for workers, Selikoff and company showed that there are far more workers at risk than previously thought.

Brooke Mossman is aware that the one sentence she devoted to the subject of workers and asbestos in Science looks, in retrospect, somewhat skimpy in an article intending to deal with public-policy issues as well as science. "We didn't have room for everything," she says. "I resent being painted as not being an advocate for labor. I'm willing to say that it's logical that those people will be exposed."

Clearly, science suffers when an investigation into a crucial health problem turns into a polemical debate, each side spurred on by its cheerleaders, be they organized labor or the Safe Buildings Alliance. Distinguished scientists both, Selikoff and Mossman resemble the blind men who tried to describe the shape of an elephant according to the part they happened to be holding. Either asbestos is not so bad because the threat to building occupants appears so low, or it is terrible because the threat to blue-collar workers is so great.

The polemics are the inevitable residue of the history of asbestos research in America. In its first phase, research was a tool used by industry to keep workers in the dark; later, when the workers acquired a powerful ally in Selikoff, it was a weapon with which to fight back. But today, it is no longer useful or accurate to divide asbestos researchers into saviors of labor or lackeys of industry. If Selikoff and his allies would drop the cudgels of class war, and if Mossman and the younger generation of scientists would, conversely, become shrewder about the political implications of their work, perhaps they could arrive at a scientific consensus that would provide a blueprint for the asbestos policy of the future. ■



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