

The Familiar Aroma of Panic

Sensationalism in the general press can have two effects: (1) stir industry and governmental groups to corrective action and (2) cause overreaction and panic in the public's mind. We saw it in the press treatment of the "plastic pollution" problem; we're seeing it now in the asbestos situation.

Fact: Overwhelming statistical data indicate that inhalation of excessive amounts of free fibers or dust of crocidolite and amosite asbestos can cause disabling lung damage and possibly death. Result: OSHA (Occupational Safety and Health Administration) has designated asbestos as a "target health hazard"; EPA (Environmental Protection Agency) has designated it a "hazardous air pollutant." And OSHA standards for exposure to permissible concentrations of asbestos dust (5 fibers/cu cm for an 8-hr time-weighted average) have been established; they will be further tightened in July '76 (to 2 fibers/cu cm).

The general press has had a field day. Talk about irresponsible reporting! After reading one of the articles I even got to wondering about the asbestos in the taping compound in my dry-wall-construction home. Also, in the general press, the "hazards" faced by mechanics blowing out asbestos-containing brake-lining dust from old brake assemblies are highlighted regardless of published studies by the U.S. Public Health Service showing that less than 1% of the 50% of asbestos in brake linings remains a free fiber in the dust after wear, or another study that established that men working in the blow-out procedure had a time-weighted-exposure of 0.68 fibers/cu cm (compared with the five-fiber OSHA standard).

The fact that the direst predictions of fatalities are based on data from fatalities and illnesses caused by working conditions 20 and 40 years ago, and in industries where free asbestos was blown, does not hinder the imagination of the reporters. (Remember those newspaper stories about that hazardous new plastic—PVC—that was saturating the environment with phosgene and hy-

drochloric acid?) Unfortunately, the aroma of panic is familiar.

So, what's the answer?

In plastics, of course, asbestos is of primary concern to those using reinforced phenolic molding compounds, vinyl tiles, some reinforced polyesters, and other materials. And the question for these people is, how much of a problem (or hazard) does use of asbestos entail? Frankly, as yet, no one knows. To my knowledge, no data exist on concentration of loose fibers in the atmosphere when one is running asbestos-filled phenolics; we must find out. Also, apparently no data now exist on potential dangers of chrysotile asbestos (the most commonly used as a reinforcement). OSHA recognizes this in their standard when they state: "Reasons of practical administration preclude a variety of standards for different kinds of asbestos and of workplaces. Also, while the evidence tends to show that crocidolite, for instance, is more harmful than chrysotile, the evidence is not sufficient to establish separate standards for varieties of asbestos." Also, they recognize the differences in medical opinions when they state: "Most medical opinion is divided between a two-fiber standard and a five-fiber standard." (Both quotes from *Federal Register*, Vol. 37, No. 110—Wed., June 7, 1972.)

The nut of it is that there is still a great deal yet to be found out. Hysterical publicity never solved a problem. The answer lies in cold objectivity in gathering and analyzing sufficient data to control the problem. There is no question that asbestos can constitute a health hazard (so can handling sulfuric acid). Don't let's throw the baby out with the bath water.

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Gentlemen:

For those of you who may not have already seen it, attached is a copy of the January 21 New York Times Sunday Magazine article on asbestos by Robert Sherrill. As predicted in our memo of January 17, the article is a cornucopia of innuendo, misinformation, and unwarranted suppositions, all designed to portray the asbestos industry in the United States as an irresponsible villain.

Also attached is a copy of the AIA/NA letter to The New York Times on the article. The letter has been reviewed and approved by the members of the Executive Committee and has received legal and medical clearance as well. Each member company of the Association should feel free to use the letter as needed to deal with questions raised as a result of the Times article. A short covering note which accompanied the letter to the Times is also attached.

We shall keep you informed when and if the Times agrees to publish the letter.

Sincerely,



Matthew M. Swetonic
Executive Secretary

Enclosure

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Asbestos, the saver of lives, has a deadly side

By Robert Sherrill

Shipyard work attracted about 4.5-million Americans into its ranks at one time or another during World War II, and an estimated 3.25-million of those people are still alive. If they think about the experience at all these days it is probably to again remind themselves with satisfaction that things could have been worse. Whether they went into the work simply for a paycheck, or as a kind of emancipation (at some shipyards nearly one-third of the workers were women), or as an alternative to the military draft, those who built and repaired America's ships took comfort in supposing that however dirty and boring the work sometimes became, at least it was safer than being in the front lines.

Now it appears they may have been wrong to think so. The fatality statistics are still too scattered and iffy to yield a solid conclusion, but there are some disquieting hypotheses to be drawn from such cases as that of the New York tire company executive we shall call Charles Armin because his family prefers to keep his real name out of this. Armin had never had a serious illness in his life. He was a 200-pound, robust, hearty fellow who looked much younger than his age, 60. He enjoyed sailing in his spare time and ran a taut ship on the job, too.

Then in December, 1971, he began getting sharp pains in his chest, enough to worry about, enough to send him to the doctor. Tests showed his heart was in fine shape, and the lung X-rays showed nothing wrong. Still, the pains persisted and grew worse, and in April the doctors decided to go in for a look.

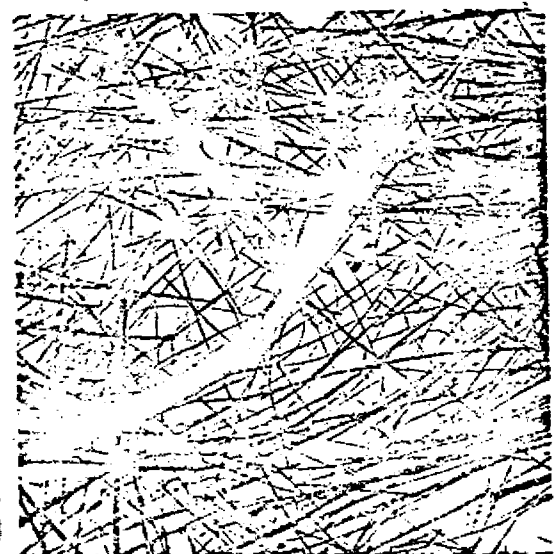
They found that Mr. Armin was suffering from mesothelioma, a kind of cancer that has only come into the medical fraternity's conversation in recent years. Mesothelioma, which has been so rare that it is not separately categorized in international medical classifications, is cancer of the chest lining or of the abdominal lining. Everyone who gets it is going to die from it within a year because it covers the whole lung area from apex to base, or infuses the whole abdomen, and no surgeon can take out so much and leave a survivable patient. It is a painful disease and progressively so. The cavity lining fills with fluid, which must be drawn off periodically; when the disease strikes the chest area the patient slowly suffocates. None of the usual cancer palliatives do much good, and

there is no known cure. Mr. Armin's mesothelioma was discovered in April. He was dead 14 weeks later.

The thing that makes his case—among a number of others—seem so ominous to some occupational health experts is that they know what caused it, and they know that the same cause has touched the lives of millions of other Americans. The cause was asbestos.

Now, asbestos can be credited with saving many lives: fireproof clothing, fireproof insulation in buildings, safer and more durable brake linings, etc. But now asbestos is beginning to reveal its other side, not only in the appearance of the compara-

tively rare mesothelioma, but, on a much broader scale, as a catalyst of just plain lung cancer, and of asbestosis, a crippling disease which scars the lungs and interferes with the passage of oxygen into the blood. Anyone with an advanced case of asbestosis will probably feel more comfortable climbing the stairs backward, so that he can sit down on each step. He also can be certain that because of the presence of the asbestosis he has as much chance of developing cancer as of escaping it. Heavy doses of asbestos in the lungs also encourage the carcinogenic effects of tobacco smoke to a remarkable degree; studies have shown that asbestos workers who smoke have a lung



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cancer rate 800 per cent higher than smokers in the general population.

Occupationally, probably five million or so Americans—insulation workers, construction workers, oil-refinery workers, etc.—breathe a significant amount of asbestos dust every day they go to work. The hazard also crops up in distinctly nonoccupational places, such as the Northside Elementary School in Lander, Wyo., which recently was closed by the state health department because asbestos which had been sprayed as an insulation on the ceiling was beginning to come loose and mix with the air in dangerous amounts. But wherever encountered, the hazard is especially insidious because it is like a long-term time bomb: For reasons doctors don't fully understand, the diseases related to asbestos do not explode for many years after the patient breathed it in.

Mr. Armin, for example, had had nothing to do with asbestos since World War II, when, from 1941 to 1943, he was a tinsmith in the Brooklyn Navy Yard. He helped install fiber glass in destroyers' refrigeration holds, and he also secured asbestos-covered pipes with hangers and straps. After 1943, he got a white-collar job away from the shipyard and never again worked with asbestos. His 29-year lag between contact and illness was not surprising; indeed, for asbestos disease, 25 to 30 years is the normal period between exposure and development of symptoms, which is why medical scientists who have specialized in the occurrence of asbestos-related industrial diseases believe that the first big wave of cancers from World War II shipyard exposure may be at hand.

Among those who think so are Drs. Irving J. Selikoff and E. Cuyler Hammond. Dr. Selikoff of Mount Sinai School of Medicine, City University of New York, is at least among the three or four top authorities on asbestos disease. Dr. Hammond is vice president of the American Cancer Society in charge of epidemiology and statistics, who already has gained a slice of immortality as the fellow most responsible for statistically demonstrating the relationship between smoking and cancer. To some high officials at the U.S. Department of Labor and to many high officials in the asbestos industry, these two doctors and their colleagues represent a kind of reform plague.

Indeed, Selikoff is seen by some leaders of the asbestos industry as a cruel showman. F. J. Solon Jr., vice-president for environmental affairs of Johns-Manville Corp., the nation's largest producer of asbestos, says, "To terrorize people who worked in shipyards 30 years ago, and now can't do a g.d. thing about it—that's something I couldn't square with my conscience."

Of the shipyard dangers, Selikoff says this: "We do know that there are a large number of mesotheliomas in Great Britain. Probably over 1,600 now, people who worked in British shipyards starting in 1935. They are five years ahead of us, so Britain casts its mesothelioma shadow over the United States. We know it's a large number, but what the count will actually be we do not know. Nor do we know the percentage of incidence in Britain; they don't have what we call a population base. But any percentage would be a terrible situation. The only data that we do have, that gives percentages, is a new paper just come out by Dr. D. Fletcher in Barrow, England, who followed

a group of shipyard workers from 1963 to the present, and he compared those who had X-ray stigmata of asbestos exposure with the general male population in that area. He found a three-times increase of lung cancer among those who had X-ray evidence of asbestos exposure."

Industry spokesmen note that the British experience may not be wholly comparable to the American, since in British yards asbestos was applied with a spray process not used in the U.S.)

The thing that is so alarming to Selikoff's group is that some risk applies not only to asbestos workers (only one-five-hundredth of the shipyard payroll), but to everybody who worked downwind or in the general vicinity of the asbestos jobs. In shipbuilding, this means anybody who has worked within the confines of the ship's structure: welders, shipfitters, machinists, pipefitters, electricians, carpenters, boiler-makers—the whole gang.

"You don't have to work with asbestos for 30 years to develop mesothelioma or some other cancer or asbestosis from it," Selikoff explains. "Absolutely not. Because once you get it in your lungs, it stays there forever, and as the years go by your lung continues to be exposed even though you may be out in the Rockies. The nice air in the Grand Canyon won't protect you because you've already got it in your lungs."

In 1951, the lung X-rays of Robert Kerr looked normal. He was a little short of breath, and Dr. Selikoff couldn't understand why, but he put it down to all that dust Kerr was breathing at the quarry where he worked. X-rays in 1954 showed Kerr developing some lung scarring. It looked like asbestosis, and Selikoff asked Kerr if he had ever worked with asbestos. No, he said, never. He told Selikoff his whole employment history and asbestos work wasn't part of it. By 1958 the X-rays showed scarring in both lungs. Selikoff's suspicions increased: Was Kerr certain he had never worked with asbestos? Nope. Never. But as he talked to Selikoff, Kerr's wife interrupted: "Bob, do

got married? In 1935, you worked in that brake-lining place." "Oh sure," said Kerr, "but I only worked there for six months as a weaver."

"And here's his film on June 7, 1972," says Selikoff. "You can see the white stuff all through the lungs. Bob's retired now, 50-odd-years old, living in Florida, unable to breathe, can't even do his own lawn. Six months in 1935! Came up from Florida to see me to make sure he had no cancer. He doesn't. He just can't breathe."

A number of asbestos-company officials and asbestos-union officials who rose through the ranks have found that they are no safer for having been away many years from the actual handling of asbestos. Raymond Rider entered the asbestos trade in 1947, but in the nineteen-sixties he became an official with New York Local 12 of the International Association of Heat and Frost Insulators and Asbestos Workers, and for 10 years he didn't touch the stuff. But he had breathed enough in his early career. X-rays taken in Jan., 1971, showed he was still in the clear, but by Feb., 1972, they showed mesothelioma. Since then he has had lung surgery, 24 cobalt treatments and extensive chemotherapy. His father, George Rider, also a union officer, died of the same disease.

The response of the industry and especially of the Federal bureaucracy has been strangely indifferent. The random breather may not care, even though asbestos can harm him too—if, for example, he inhales asbestos thrown into the air by the demolition of buildings. But the asbestos worker feels very lonely with his special demon. William G. Bernard, secretary-treasurer of the Asbestos Workers Union and himself a victim of lung-scarring, complains, "You know, we have damn near as many, or more, people who work with asbestos as there are coal miners in the country. But nobody cares about us, because we don't have any disasters. The miners have a disaster and their pictures show up on the front pages with dirty faces, and everybody feels sorry. So they put a black lung bill

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through Congress. We have a higher percentage of people dying of respiratory trouble, but nobody gives a damn about it."

ON Jan. 1, 1943, Locals 12 and 32 of the Asbestos Workers Union in New York and Newark, N. J. had 632 members. Dr. Selikoff and his colleagues have traced the 625 who matter here (seven died early, mostly of accidental causes). Given their age, 203 of those men would normally have been expected to die by the end of 1962. Instead, 255 had died—an excess over the normal death rate of more than 20 per cent. About seven should have died from lung cancer, but 45 died of it. Instead of the normal nine or 10 deaths from cancer of the stomach, colon or rectum, there were 29—"not so unexpected," as Selikoff points out, for "anybody who inhales dust also ingests it. Any worker is always spitting out the stuff you think he's only inhaling." And whereas nobody in the general population dies of asbestosis—scarred lungs—12 men in this study group died of it during the first 20 years, and 4 died of mesothelioma.

That left 370 of the group still alive on Jan. 1, 1963. Between then and the end of 1971, 78 of them should have died if they followed the pattern of the general population. Instead, 168 died. "And why? The same thing," says Selikoff. "There should have been four or five lung-cancer deaths in this group. There were 43. There should have been no deaths of mesothelioma—that doesn't occur in the general population. There were 23. There should have been three deaths of cancer of the stomach or rectum. There were 12. And of course there should have been no deaths from scarred lungs. There were 20.

"If we total up this one small group of workers from Jan. 1, 1943, to Dec. 31, 1971, almost 20 per cent died of lung cancer. Out of the 430 men who died, one out of every five asbestos workers died of lung cancer. Almost seven per cent died of mesothelioma. Almost 10 per cent

died of cancer of the stomach, colon and rectum. Over seven per cent died of asbestosis."

Nor are these figures peculiar to the locals in question. Selikoff goes on to cite more extensive studies confirming that similar increased deaths "occur in every single group of asbestos workers that's been examined." And he concludes: "This is simply an occupational disaster without parallel in American history."

Such an alarming finding is just now beginning to penetrate the thinking of workers, which is rather odd, since asbestos industry officials and the U. S. Public Health Service and the U. S. Department of Labor have known for years that asbestos could be a serious hazard. For more than 60 years cases of asbestos disease have been positively diagnosed.

Deaths due to asbestosis were clearly defined at least as early as the nineteen-twenties. The association between lung cancer and occupational exposure to asbestos was proved in a paper published in 1955 by Sir Richard Doll, then chief statistician of the British Medical Research Council. In 105 consecutive autopsies at one asbestos plant in England, he found 18 deaths due to lung cancer. And in 1965 an equally conclusive connection was established between asbestos and mesothelioma in a paper published by Selikoff, Hammond and Dr. Jacob Churg in *The New England Journal of Medicine*. Since then, there has been an explosion of literature on the occupational hazards of asbestos, encouraged by symposia such as the one held recently in Lyons, France, by scientists from around the world.

The asbestos industry and the U. S. Department of Labor have not seemed exactly overjoyed to receive all this new data; indeed, their basic response has been a combination of defensiveness and hostility and furtiveness. In 1964, when Selikoff was organizing an international symposium, he received a letter from the law firm representing asbestos textile companies, informing him that the industry was aware of what he was up to and implying that if any derogatory

remarks about asbestos that might harm its sales should emanate from the conference, he could expect to see them in court. The U. S. Public Health Service conducted air samplings in a couple of dozen asbestos plants in 1964, but it refused to disclose its findings to Selikoff, or, as he puts it, "apparently the key to the file cabinet was lost." Though workers in shipyards today are subjected to much the same asbestos hazards as

in World War II, Navy medical officers generally refuse to talk about the problem or to discuss what they are doing, if anything, to protect workers in the yards under their command.

Selikoff's crowd has run into this wall since the beginning. In the early fifties, having recently won the American Public Health Association's Albert Lasker Award in Medicine for his part in developing a drug crucial to the control of tuberculosis, Dr. Selikoff opened a clinic in Paterson, N. J., to continue his research into pulmonary diseases. Among his first patients were 17 men who worked in the Union Asbestos and Rubber Company plant, which started production in Paterson in 1940 and closed in 1954. At that time, all 17 men were strong and working, and appeared likely to go on doing so for many years.

But within seven years, six were dead, and today, only two survive. Seven died of lung cancers, one of mesothelioma, one of stomach cancer, one of colon cancer, four of asbestosis, and one of "other" ailments. Something strange was developing, and Selikoff wanted to broaden the investigation to find out what had happened to all the men who worked in that plant from the time it opened. He needed money, and he asked the U. S. Public Health Service for a grant. It turned him down. When he

asked the asbestos company officials to let him look at their personnel records, they said they had lost them. But because the factory's output had been used in war production, all its employes had had to be cleared by the F.B.I., so a list of the workers on the factory's payroll during the war years 1941 to 1945 did exist, and by a process Selikoff prefers not to discuss, he got his hands on the names of the 933 workers of that era.

"That's all we needed," he recalls. "That and a lot of work, because we had to trace those 933 men. Surprisingly, we were able to find 877 by the end of 1971."

The effort proved revealing. According to Dr. Hammond's calculations, in a normal population group of that size, considering age and sex factors, 299 would have died by 1971. But in this group, 484 were dead. Normally 50 could have been expected to have died of some kind of cancer; in this group, 143 died of cancer. The group's lung cancer rate was nearly 700 per cent higher than the general population's; its stomach and colon cancer rates were twice as high. Seven men had died of mesothelioma.

In those war years, many of the workers had been employed for only brief periods at the plant. "Of those who worked for one week or less, when X-rayed 30 years later half of them had some scar-

ring; nine had nothing and 10 had some scarring. Less than one week, and they had abnormal X-rays!" says Selikoff, who never ceases to be amazed by the statistics he and Hammond use. "So the problem is not only how much you work. Of course, the more you work, the worse it is. But even those who had very little exposure, if you live long enough you're going to have problems."

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throw his net more widely. Selikoff went to Johns-Manville Corporation in Manville, N. J. He was not welcome. "Somehow," he says, "the company couldn't find itself able to cooperate." Nor could the Federal Government find funds for the research. But Joe Modrone, president of Local 800, United Papermakers and Paperworkers, which has jurisdiction at Manville, took Selikoff into the basement of the union's headquarters and scratched around and came up with the seniority list for Jan. 1, 1959. There were about 3,000 names on the list. Of these, 689 had worked at the plant for 20 years. Selikoff's men set out to track them down.

"Let's see now what happened to them—and mind, this is only the beginning of what will happen to them," says Selikoff. "Given their ages, there should have been 134 deaths among the 689. There were 199. And again, why did these people die who were not expected to die? Eight should have died of lung cancer; 27 actually did. And 15 died of mesothelioma." Two or three times as many died of cancer of the colon or cancer of the rectum or of the stomach as normally would be expected. Ten per cent died of asbestosis. "It was becoming monotonous—a hell of a monotony! So not only in the plant at Paterson but now in Manville, too, the same picture."

But while Selikoff and Hammond and their crowd did everything they could to uncover evidence of the disaster that was occurring in the asbestos industry, industry and Government remained unmoved.

The most impressive case of bureaucracy/industry indifference occurred at the Union Asbestos and Rubber Company factory in Tyler, Tex. This is the same outfit that had operated the factory in Paterson, N. J., before closing it in 1954. Union Asbestos later sold out to Pittsburgh Corning Corp. But under any name, the Tyler plant was still a foul place to work. Reputedly, in some areas of the plant the asbestos dust was so thick workers couldn't see across the room. Medical facilities consisted of two first-aid cabinets, one with a broken glass door admitting asbestos dust.

asbestos waste was dumped in nearby fields, sometimes to a depth of three feet, that children sometimes used as a playground. Bags in which asbestos had been shipped to the plant and which were still coated with asbestos dust were sold to local nurserymen who do a tremendous business in roses.

It is futile to guess at the number of nurserymen and customers who breathed an injurious amount of asbestos dust from the sacks, but the factory workers can be counted. Personnel records microfilmed by the Public Health Service show that between 1954 and 1972 at least 895 persons were employed there. They were working under deadly conditions and the U. S. Department of Labor and the Public Health Service were aware of these conditions at least as early as 1967. But they kept quiet.

Inspectors from the old Bureau of Occupational Safety and Health (BOSH) took air samples in 1967 that showed that the count of asbestos fibers was in some parts of the plant 60 times higher than today's officially declared safe

level of five fibers per cubic centimeter. These findings were withheld from the workers. In 1968, because the Tyler plant turned out asbestos insulation under a Navy contract, it was subjected to an inspection by the Labor Department under the Walsh-Healey Act. The company could have been heavily fined or even closed because of its health violations; instead, the Labor Department took no action at all.

That's the way things stood until 1970, when Congress passed the Occupational Safety and Health Act. With that act, BOSH was phased out and replaced by NIOSH—the National Institute of Safety and Health. With the change of initials came a change of bureaucrats and attitude, too. Among them were Dr. Joseph K. Wagoner, who became director of the Division of Field Studies and Clinical Investigations, and Dr. William M. Johnson, a recent product of the Harvard School of Public Health, who became Wagoner's assistant. They inherited a medical chaos, a burial ground of old statistical bones hastily covered up by their predecessors.

"We even inherited about 2,000 air samples that hadn't been counted," Johnson recalls, "because the previous inspectors had been out collecting data without ever coming to grips with what they were doing. They would just keep rescheduling surveys, sometimes a second or third time around at a plant without really giving any thought to what it was really showing from a health standpoint."

Buried deep in the files he found Tyler, Tex. Why had Public Health Service and Labor Department officials covered it up? "I could say they were stupid, or that it was criminal negligence, or bureaucracy, or I could say they were afraid that if they did start getting concerned about this that their right of entry would have been cut off," says Johnson, "but the fact is, I don't know." All he did know immediately from the records he uncovered was that "the plant had no business operating."

But still the higher bureaucracy balked. "We transmitted our sampling results to the Labor Department," says Johnson, "and also followed up with a comprehensive report." The report showed that of a sampling of 17 men who had worked in the plant 10 years, eight had asbestosis. "The Department of Labor

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would not honor our samples. They wanted to take their own for compliance. They went in—I don't remember the exact date; I believe it was November, 1971—and they took some samples and came up with citations. But they didn't mention asbestos in the citations and the citations only added up to \$210 in non-serious violations."

So much public ridicule and bad publicity greeted that punishment that Labor felt obliged to reinspect the factory and levy a \$6,990 fine. Two weeks later, claiming the fines were too great a burden to bear, Pittsburgh Corning decided to close the plant. Left behind were many Tyler residents who will eventually die of asbestos disease.

Are there other asbestos outfits still humming away in the same condition that filled the lungs of Tyler? Some are trying to shape up. At the Johns-Manville plant in New Jersey, for example, company officials claim—and union officials agree—that in 90 per cent of the factory the asbestos fiber count is already below the five-fibers per c.c. maximum set by Federal health standards. The dust is sucked up through hoods over the machines and captured in a central bag house. And at J.-M.'s asbestos mill in Asbestos, Que., the bagging of the mineral is done entirely by machines; everything is enclosed; human hands don't touch it, and the dust is reportedly carried away in 70,000 separate suction operations. Johns-Manville is also "considering" hiring only non-smokers in some of its operations. "This corporation has a conscience 80 miles long," says J.-M.'s Vice President Solon. "We've sent out instructions to clean up or close down, but I won't tell you the whole industry takes that attitude."

Dr. Johnson, despite the fact that he has only a restricted view of the industry, says he knows of "about a half-dozen plants" in which the asbestos levels are four to eight times what the Labor Department concedes is the maximum safe level. But actually, nobody knows how widespread the hazard is. Federal funding for inspections is at a rock bottom minimum. And unions may be as lethargic as industry or Government when it comes to informing workers of the risk. Officials of the United Cement, Lime and Gypsum workers, which has jurisdiction at a plant where asbestos dust concentration is said to be over 100 times the safe

level, say they haven't even bothered to get their workers X-rayed yet, though a U. S. Bureau of Mines report exposed the danger last March.

As for the enforcement of health standards established under the Occupational Safety and Health Act, Federal officials have conceded in testimony before Congress that if they were going to enforce health standards properly, they would need about one hygienist per 35,000 workers.

So far as can be determined, the Labor Department at present has 60 hygienists — or about 1 per 1.2 million workers—to enforce all health standards, not just those relating to asbestos hazards.

Since there seems to be no great rush to enforce any asbestos health standards, it hardly matters whether the standards are the proper ones. But the manner in which they were decided may give some further indication of what the laboring man can expect in the way of protection from the Federal agencies and the industry.

At issue was whether to set the standards at a maximum permissible air content of two asbestos fibers (each longer than 5 microns) per cubic centimeter or five asbestos fibers. In either case, that's quite a bit of dust. A cubic centimeter is about the size of a small thimble of air, and a workman will inhale about six to eight million of them in a typical day. So the issue was whether to require the companies to maintain conditions which would prevent a worker from having to inhale more than 12 million to 16 million fibers of a certain length, or 30 million to 40 million fibers. With a substance that the Labor Department concedes "is causally related to asbestosis and cancers," the multimillion differences were obviously no trivial matter.

With what appeared to be an effort to get the best answer, Labor Secretary James Hodgson early in 1972 appointed an outside Advisory Committee on Asbestos Dust made up of scientists and engineers and labor officials. He also had the assistance of an inside advisory group of medical men and scientists put together especially for this problem by NIOSH.

Also from the outside he hired Arthur D. Little, Inc., a consulting firm, to come up with some advice on the economic feasibility of requiring industry to get rid of its asbestos dust. Arthur D. Little's panel of experts was made up of 13 executives from the shipbuilding industry, 12 executives from the asbestos industry, and a health group of 11 doctors and technicians, all but two or three of whom reputedly have been "consultants" to the asbestos industry at some time in their careers.

The Advisory Committee on Asbestos Dust told Hodgson he should drop the standard to two fibers. NIOSH's panel agreed that two fibers was none too low. But Arthur D. Little concluded that five fibers was perfectly safe and that dropping the standard to two fibers would cost industry far too much money. In

addition, four days of hearings were held at the Labor Department offices in Washington, with industry contending that Selikoff is right up to a point, but that he goes too far and interprets his findings too wildly. Matt Swetonic, Secretary of the Asbestos Information Service, a New York health data distribution center funded by the industry, says, "There has been considerable controversy with Selikoff not so much on the effects of asbestos, but on the best means to control it and what sort of levels are necessary to control various asbestos diseases." Industry people, says Swetonic, believe that the perils of the insulation workers—who face periodic massive doses of asbestos-laden air—are too often confused with what industry contends are the manageable low-level exposures of the asbestos manufacturing factories.

In the end, Hodgson, insisting that he had arrived at his decision by an independent appraisal of all evidence, buffed his own advisory group and said that a five fiber standard would be in effect for the next four years (Coincidentally, Johns-Manville Corporation the same day notified its stockholder that the ruling would no hurt their sales and earnings).

Selikoff points out that this ruling was designed to set a safety level for asbestosis, not for cancer, and that in any case, qualified scientists simply cannot be sure enough about the nature of asbestos related disease to say where the level should be fixed. In this light, he argues, Hodgson's ruling was at best in cautious. "There's a lot of published evidence that in two fibers per c.c. mesothelioma occurs, lung cancer occurs, asbestosis occurs. An industrial hygiene practice in our country has been that when there is a serious risk, you build in big safety factor. But wh

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Dr. Irving J. Selikoff, in his laboratory at Mount Sinai School of Medicine. Because of his efforts to expose the dangers of handling asbestos, some Government and industry officials consider Selikoff and his colleagues "a kind of reform plague."

the Labor Department has done is say, 'We don't know for sure what level will certainly cause cancer and without this knowledge there is no requirement for extra caution,' instead of saying, 'These are the lives of hundreds of thousands of American workers that we are responsible for and therefore let's set the most prudent level.'"

By continuing the five-fiber standard for another four years—a period that will probably see 100,000 or so new men enter asbestos-related industries—Selikoff predicts the Labor Department has doomed 20,000 to unnecessary lung-cancer deaths, 7,000 to unnecessary mesothelioma deaths, 7,000 to unnecessary asbestosis deaths as well as deaths of other cancers. And that's not counting combination effects—asbestos plus tobacco smoke, asbestos plus the coal-tar pitch workers like roofers must handle. All in all, Selikoff predicts that "by a stroke of the pen, 50,000 more lives were thrown down the drain."

The A.F.L.-C.I.O., agreeing with Selikoff, has sued the Department of Labor in the U. S. Court of Appeals, charging that Secretary Hodgson did not consider the evidence or act to protect workers as the law requires him to do, and demanding that he review the evidence again and set tougher standards. From the opposite direction, however, comes pressure to ease up further. The National Insulation Contractors Association has petitioned the Labor Department to give its member companies—who represent a large segment of the industry that hires asbestos workers—a year's deferment from monitoring requirements. The N.I.C.A. promises that if the asbestos workers will cross their fingers and hold their breath until the end of 1973, virtually all of the insulating companies by then will have switched to asbestos-free materials such as fiber glass.

Meanwhile, Selikoff's flying wedge continues relentlessly down the field. Not long ago, Selikoff was having some dry-wall construction work done in his office. He sat there watching the workmen and all of a sudden it occurred to him: "I said to myself, well, hell, if these guys have been putting up that stuff—watch them spackle it and sand it down so you can't see the joint—they're not immune. I had enough background knowledge to know that the taping compound has asbestos in it. So I got in touch with the painter's union, and their

tapers came up to see me. To make a long story short, that week one of their men was operated on for lung cancer. So we cut the lung; the electron microscope showed it was loaded with asbestos. This is a new trade, began in 1946 or so, right after the war—everything became dry-wall—most of the guys in it for only 10, 15, 20 years. We just began a survey at the union's request. We've X-rayed our first 17 men, and nine of the 17 have asbestosis.

These are the old-timers, with 25 years in the trade. Very mild, because these are early cases so far. But we know what's in their lungs." And so another group falls under Selikoff's cloud.

But of course, as in any scientific confrontation, there is always the possibility of miscalculation. Perhaps Selikoff and Hammond and their colleagues at Mt. Sinai Hospital and in the American Cancer Society shouldn't frighten shipyard workers and painters and pipefitters and insulation workers and the rest. Perhaps Assistant Labor Secretary George C. Guenther—who once defended the small fines levied against corporate health violators by saying that "we are not in the fundraising business"—was correct to upbraid Selikoff for having chosen, as Guenther judged it, "to overdramatize the matter." It is not, however, an argument that evades resolution. Those who have worked around asbestos for any length of time will, sooner or later, find out who was right. ■

The skin of the salamander

Asbestos, a name that embraces a number of fibrous mineral silicates, has been used by man for thousands of years, and for most of that time its qualities have produced confusion and mystery and myth. In the aggregate it is a rock with all of a typical rock's rigidity, but broken up it yields fibers that can be spun and woven as easily as flax or cotton. For centuries it was commonly assumed that asbestos was a vegetable rather than a mineral. There was something obviously strange and wonderful about fibers that seemed so gossamer and yet were as strong as steel wire; an ancient explanation of asbestos' most mysterious power was that the material came from the skin of the salamander, a mythical animal that could endure fire without harm—a notion that was useful to poets even as late as last century (Southey: "Fly, Salamanders, on Asbestos' wings, To Wanton in my Delia's fiery glance").

Asbestos remained primarily a curiosity until the 1870's when—because of its flexibility, its tensile strength, its invulnerability to heat and acids and alkalis—it was first commercially mined. In the intervening years it has become a prized

ingredient in thousands of industrial products: floor tiles, filters in the manufacture of beer and other foodstuffs, electrical tape, paddings of all sorts, paper binding, paints, etc.

Nearly four million tons are mined annually throughout the world; the United States, though it contributes little to the total production, is the world's largest consumer of the mineral. The Bureau of Mines says we used 758,571 tons in 1971. U.S. use of asbestos has grown 1,000-fold in this century, compared to an 80-fold growth for petroleum. Ninety-five per cent of this is chrysotile asbestos from the open-pit mines of Quebec, Canada, probably still the world's most productive source, although Russia is beginning to challenge Canada's production lead. Amosite asbestos, most important for shipyard work, comes largely from South African mines. Rudolph Wild, the brilliant engineer whose work a generation ago persuaded the U.S. Navy that amosite asbestos was superior for shipyard insulation and should be written into Navy contract specifications, paid for his involvement with the magic mineral. He died of mesothelioma.—R. S.

A08031

Asbestos Information Association/North America

22 East 40th Street
New York, N. Y. 10016
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January 26, 1973

The Editor
The New York Times Magazine
229 West 43 Street
New York, New York 10036

Dear Sir:

Robert Sherrill's lengthy article, "Asbestos, the saver of lives, has a deadly side" (January 21), contains numerous statements of "fact" and interpretation with which we disagree, however, the continued inference throughout the article that the asbestos manufacturing industry in the United States has steadfastly refused through the years, even to the present day, to honor its obligations with regard to the health of its employees is one that we believe deserves comment.

I believe it is appropriate to state at the outset that the Asbestos Information Association/North America and its 19 member companies are fully cognizant of the potential serious health effects of excessive asbestos dust inhalation and of our obligations to protect industry workmen from the various asbestos related diseases. It is also important to point out that the asbestos related disease being found today among some long-term industry employees is a result of conditions existing decades ago, at a time when neither the industry nor the medical profession knew very much about the health effects of asbestos and even less about the proper means for their control.

It is because this statement of principle contrasts so sharply with the picture of the industry painted by Mr. Sherrill that this letter has been written.

To give credit where credit is deserved, there is no doubt that Dr. Selikoff, whose research findings and statements have received enormous publicity over the past half-dozen years, served as a catalyst to precipitate a new and stronger sense of urgency and responsibility in the asbestos industry in the United States than had ever existed before with regard to occupational health. Unlike Mr. Sherrill, however,

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The Editor
The New York Times Magazine
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Dr. Selikoff has never tried to place the blame for past mistakes and failures on the industry alone. In a 1970 paper describing the results of a joint industry-labor sponsored research project, he stated that "It is too easy to indulge in what might be called the demonological theory of industrial hygiene history." Rejecting the proposition that either industry or organized labor was solely at fault, he continued: "Both conclusions are too convenient and are essentially erroneous. It is much nearer the truth to say that both industry and labor shared in ignorance and neglect of the problem. Science and medicine are also at fault here for inadequate attention to environmental and occupational health."

Mr. Sherrill's evaluation of the situation was not so balanced.

Using words such as indifferent, defensive, hostile, uncooperative, etc. to describe the industry response to the problem in general and to Dr. Selikoff's findings in particular, Mr. Sherrill selected a number of isolated incidents, mostly from the early 1960s, to document his thesis of a totally irresponsible industry. At no point in the article does Mr. Sherrill make mention of any of the progressive steps taken by the industry to learn more about the health hazards of asbestos and the proper means for their control.

For example, in referring to the recent "explosion of literature on the occupational hazards of asbestos," Mr. Sherrill used as an example the October 1972 Lyon conference on asbestos-health sponsored by the World Health Organization. In the very next sentence, he then states that the asbestos industry has "not seemed exactly overjoyed to receive all this new data." In reality, using the same conference as an example, of the approximately 125 attendees at Lyon, more than three-dozen were representatives of the world asbestos industry seeking not, as Mr. Sherrill would have us believe, to avoid knowledge but seeking in fact, to gain even more knowledge on asbestos and human health.

In addition, of the 48 medical and technical papers presented at the conference, nine represented the findings of industry sponsored research, and another five were reports presented by asbestos industry scientists on their own research. In comparison, only six of the papers at the conference were presented by doctors associated with Dr. Selikoff's laboratory at Mount Sinai and one of those was a paper coauthored with an asbestos industry scientist!

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In fact, two of the world's largest nongovernmental sources of funds for asbestos-health research are the Institute of Occupational and Environmental Health in Montreal, which is sponsored by the Quebec Asbestos Mining Association, and the Asbestosis Research Council, sponsored by the British asbestos manufacturing industry. The data generated through research sponsored by these two organizations and also by various asbestos companies acting independently has contributed significantly to our knowledge of the biological effects of asbestos. These facts simply do not support Mr. Sherrill's statements about an uncooperative, indifferent industry.

Later on in the article, Mr. Sherrill insinuates that the infamous Tyler, Texas plant is indicative of conditions throughout the industry. Mr. Sherrill is obviously theorizing from a lack of knowledge rather than from valid documentation, for had he accepted our repeated invitations to visit an asbestos manufacturing plant, he would have realized that the situation which existed at Tyler is not indicative of conditions throughout the rest of the industry.

This is not to say that every dust station in every plant in the industry is below the five fiber standard established by the U. S. Labor Department. The industry has always admitted that some difficult engineering problems are still to be overcome, however employees are being protected by other approved means while engineering controls are being instituted. The asbestos manufacturing industry has spent approximately \$110 million in the past decade on dust control and expects to spend an additional \$95 million over the next few years to achieve complete compliance with the Labor Department standards.

In discussing the 1964 New York Academy of Sciences symposium on asbestos, Mr. Sherrill neglects to mention that following the symposium, a group of asbestos textile manufacturers, disturbed at the high rates of disease Dr. Selikoff was finding among his insulation workers, approached the U. S. Public Health Service and requested that the government undertake a complete investigation of the U. S. asbestos textile industry to determine if a serious health problem existed. The industry gave its complete cooperation to the government on this study, which eventually involved nearly 10,000 asbestos industry employees throughout the country. Progress reports on the various findings of this study have been presented at medical meetings for a number of years. Needless to say, your writer made absolutely no mention in his article of the industry's

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The Editor
The New York Times Magazine
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role in initiating this study, nor of the complete cooperation extended to the government by the various companies involved.

With regard to the Department of Labor standards on asbestos, Mr. Sherrill attacks the government for its decision to retain the present five fiber per cc standard for another four years before lowering it to the two fibers per cc standard recommended by the National Institute of Occupational Safety and Health (NIOSH) and the Department's own asbestos Advisory Committee. What Mr. Sherrill fails to mention is that both NIOSH and the Advisory Committee recommended that the standard not be lowered for two years (Mr. Sherrill would have us believe they wanted it lowered immediately), and that Labor's decision to delay the adoption of the stricter standard for an additional two years was to grant the industry the time required to develop and install the sophisticated engineering controls necessary to achieve such a tight dust standard.

In addition, Dr. Marcus M. Key, Director of NIOSH, is in total disagreement with Dr. Selikoff's prediction that of the 100,000 or so new men that he estimates will enter the asbestos industry in the next four years, approximately half will die of asbestos-related disease because of Labor's delay in adopting the two fiber standard. Dr. Key assured the Labor Department in a letter sent prior to the publication of the standards that "a new employee could work up to ten years at five fibers per cc before the remaining working exposure of two fibers per cc would approach" a potentially hazardous buildup of asbestos in the body. Dr. Key also admitted that the NIOSH technological "feasibility data were limited" and that if the testimony presented at the hearings and the Arthur D. Little "feasibility study indicate that a two fibers per cc level is not achievable until four years hence, I would accept this as a reasonable health standard."

It should also be noted that as late as 1968, the American Conference of Governmental Industrial Hygienists' (the only national standard setting body in existence at that time) recommended standard for asbestos exposure was five million particles per cubic foot of air --- approximately 30 fibers per cc. This standard was lowered by the ACGIH to 12 fibers per cc in 1968 and to five fibers in December 1971 by the Labor Department. Thus, the standard for asbestos exposure has been lowered twice in the last five years, and represents a reduction of approximately 83 per cent of the pre-1968 levels. These facts should help place the two vs. five fiber controversy described by Mr. Sherrill in its proper perspective. Both standards are extremely tight by comparison with past levels, and the industry's support of the five fiber standard does not represent a refusal to honor its obligations to its employees.

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In addition, contrary to Dr. Selikoff's statements in the article, the medical evidence for two fibers is neither extensive nor compelling, and is, in fact, heavily outweighed by data showing that five fibers is an acceptable safe level. Thus, the Labor Department's decision to adopt the two fiber standard in 1976 clearly demonstrates, contrary to Mr. Sherrill's evaluation, that when controversies of this nature arise, the question shall be resolved, not according to industry's wishes, but in favor of the greatest protection to employees.

Of equally serious concern is your writer's obvious disdain for the Arthur D. Little Incorporated health panel of "11 doctors and technicians, all but two or three of whom reputedly have been 'consultants' to the asbestos industry at some time in their careers." One does not have to be particularly acute to insert the intended "paid medical lackey" or some such phrase in place of the word "consultant." In reality, of the 11, three were government doctors (two from NIOSH and one from the Department of the Navy); one was the medical director of the nation's largest asbestos manufacturer; two would have to be considered consultants to organized labor; only one is an actual consultant to industry; and the remaining four have done extensive research in the asbestos-health area.

The only way Mr. Sherrill's statement makes sense is to assume that since at least five of the doctors on the list have conducted research sponsored by the industry, this makes them "consultants" in Mr. Sherrill's mind and as such their findings and opinions automatically become untrustworthy. This is a rather curious attitude in light of the fact that Dr. Selikoff (a member of the panel), whose research work is the central focus of the article, was himself the recipient of substantial research funds from the Johns-Manville Corporation, one of the companies singled out in the article as being uncooperative.

While there are many other unwarranted statements and attitudes expressed in the article that deserve comment, it should now be quite clear, on the basis of the evidence presented in this letter, that the asbestos manufacturing industry in this country is not the indifferent, hostile villain that Mr. Sherrill portrayed in his article.

Since much of this information was sent to Mr. Sherrill or relayed to him over the phone, one must assume that his failure to include any of this material in his article was no accident, and that it was ignored because it would have contradicted the horrendous picture of the industry that he wished to project.

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The Editor
The New York Times Magazine
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In this same vein, it should be noted that while the Department of Labor was severely attacked in the article, no opportunity was given to Labor to defend or explain its actions. It is also significant that while Mr. Sherrill admits that Dr. Selikoff is only one of "the three or four top authorities on asbestos disease," there is no mention whatever of who the other top authorities might be, or what their views are on the various aspects of the problem. This omission is important because many of the world's ranking asbestos-health experts believe that many of the extrapolations and predictions made by Dr. Selikoff are not justified by the published medical data.

In conclusion, I hope that this rather lengthy letter has demonstrated quite clearly to you the incomplete, erroneous, sensationalized and distorted manner in which Mr. Sherrill presented the asbestos-health situation in his article.

Very truly yours,

Matthew M. Swetonic

Matthew M. Swetonic
Executive Secretary

A08037

Asbestos Information Association/North America

22 East 40th Street
New York, N. Y. 10016
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January 26, 1973

Mr. Lewis Bergman
The Editor
The New York Times Magazine
229 West 43 Street
New York, New York 10036

Dear Mr. Bergman:

In a New York Times Sunday Magazine article entitled "Asbestos, the saver of lives, has a deadly side" (January 21), your writer, Robert Sherrill, unjustly and harshly attacked the United States asbestos industry for its alleged total irresponsibility regarding the health hazards faced by its employees from the inhalation of asbestos dust.

Mr. Sherrill created this horrendous and erroneous portrait by the simple procedure of purposefully ignoring and refusing to include in his article any evidence to the contrary, even though data on medical research sponsored by the industry, money spent on dust control equipment over the years and other relevant information was sent him by the industry, and which he claims to have read thoroughly.

Although Mr. Sherrill did make a token approach to the industry for its comments, he refused either to meet with industry representatives or to visit an asbestos plant, claiming that he did not have enough time to do so. A lack of time can never serve as a legitimate excuse for a journalist's failure to properly research and document an article.

In printing Mr. Sherrill's one-sided and irresponsible article, The New York Times assumes responsibility for its contents, and therefore has a strong moral as well as journalistic obligation to print the attached letter of clarification. While we appreciate that its length is somewhat unusual, in comparison with the 20 or so columns allotted to Mr. Sherrill, our letter, if anything, is not long enough.

We await your response.

Very truly yours,

Matthew M. Swetonic

Matthew M. Swetonic
Executive Secretary

Enclosure

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The hazards of safety

To the Editor:

Robert Sherrill's one-sided and sensationalized article, "Asbestos, the savior of lives, has a deadly side" (Jan. 21), contained many errors of fact and interpretation. The following should help clarify a few of his more blatant omissions and distortions.

(1) Because of the long latent period of asbestos-related disease, the disease being found today is not an indication of present conditions but is instead a result of conditions existing decades ago, at a time when neither the medical profession, government nor the industry knew very much about the health effects of asbestos and even less about the proper means for their control.

(2) The isolated incidents cited as proof of industry indifference and irresponsibility are not indicative of the overall industry response to this problem. In the past decade alone, the asbestos manufacturing industry has spent approximately \$110-million on

dust control and expects to spend an additional \$95-million over the next few years to achieve complete compliance with the final Department of Labor standards.

(3) No mention was made whatever of the highly respected and extensive medical research which has been sponsored, co-sponsored or co-operated in by the industry through the years, and which has contributed significantly to our knowledge of the biological effects of asbestos. In fact, the Institute of Occupational and Environmental Health, sponsored by the Quebec Asbestos Mining Association, is one of the world's largest nongovernmental sources of funds for asbestos-health research.

(4) While Dr. Irving J. Selikoff has certainly made a valuable contribution to our knowledge of asbestos-related disease, it is unfortunate that Mr. Sherrill did not discuss the situation with any of the other top authorities in the field since many of them do not believe that many of Dr. Selikoff's recent frightening predictions are justified by the printed medical data.

(5) The Labor Department decision to delay adoption of the two-fiber standard for an additional two years beyond the two-year implementation period recommended by the National Institute of Safety and Health and the Advisory Committee was approved by Dr. Marcus M. Key, Director of NIOSH, prior to the publication of the standards. Furthermore, Dr. Key is in total disagreement with Dr. Selikoff's prediction that half of all those entering the asbestos industry within the next four years will die because of the delay in going to two fibers.

We believe that the above facts demonstrate quite clearly the incomplete and distorted manner in which Mr. Sherrill presented the asbestos-health situation in his article.

MATTHEW M. SWETONIC,
Executive Secretary,
Asbestos Information
Association

New York

Mr. Sherrill replies:

Even if one is kind enough to accept Mr. Swetonic's figures regarding the amount spent on dust control, the \$110-million comes to less than 2 per cent of the value of asbestos products sold in

the United States during the past 10 years, according to the U. S. Bureau of Census. Considering the health disaster that the dust has created, I don't call a 2 per cent outlay exactly overwhelming.

But before taking Mr. Swetonic's complaints too seriously, one should bear in mind that the Asbestos Information Association is funded by 19 of the nation's largest miners, manufacturers and importers of asbestos and asbestos-containing products, and the association pays Mr. Swetonic to respond almost by rote. For example, after a recent Wall Street Journal article on the hazards of asbestos, he complained, saying it was "incomplete, erroneous, sensationalized and distorted." Mr. Swetonic's defense arsenal is limited to a few standard blunderbusses.

But when he is not rattling off this non-speak as an industry flack, he can be quite sensible about the problem. In my taped interview with him, I asked, "In general, how does the industry feel about Dr. Selikoff's conclusions relating to the hazards of asbestos?" Did he reply that Selikoff was all wet? No. That Selikoff's mortality figures were cockeyed? No. Mr. Swetonic replied, "The health experience of these people [asbestos workers] has, you know, been a terrible thing and is obviously, you know, quite bad, and I think that when this information first started to come out of Dr. Selikoff's laboratory it was quite shocking to industry, obviously so."

I further asked Mr. Swetonic if he thought the problem was limited to asbestos workers. "No," he said, "I don't think I would go that far. There have been fairly substantial increases of asbestos-related diseases among manufacturing workers, especially textile workers [whose work] has been notoriously dusty. . . ."

As for the complaint that I do not quote enough doctors who are sympathetic with the asbestos industry, well, let's turn to one of Johns-Manville Corp.'s top health consultants, Dr. George W. Wright, for further evidence of the industry's slowness in meeting the problem. In the American Review of Respiratory Disease, October, 1969, Dr. Wright acknowledged that although as early as 1930 scientists "demonstrated that asbestos posed a major threat to the health of workers in the asbestos textile trade" and although subsequent research linked the hazard to other workers, "substantial numbers of persons exposed to asbestos in their occupation have never come under a protective occupational hygiene program."

This is still true, and it is the fault not only of the asbestos industry but, as I made clear in my article, also the fault of a lethargic, stupid element of organized labor and most especially of a spineless Federal bureaucracy.

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Occupational health factors in the United Kingdom

Dr. H. C. Lewinsohn,
Medical Adviser to
Turner & Newall Ltd., and
Dr. S. Holmes, Chief Health
Physicist, Turner Brothers
Asbestos Co. Ltd.

Asbestos dust, like the dust of many other basic industrial materials, can be a hazard to the health of people exposed to it in high concentrations. It is important that the risk should be clearly understood and that proper controls be exercised over the mining, manufacture and industrial use of the material.

An intensive study of this industrial hygiene problem has been carried out in the United Kingdom, where the most advanced government regulations for its control have recently been introduced. The Asbestos *Industry* Regulations were first introduced as long ago as 1931, and the pattern of control that has subsequently developed, culminating in the Asbestos Regulations 1969, has been an example to the rest of the world. This is because the British experience has shown that Regulations, where they have been properly applied, can be effective.

Three diseases have been associated with exposure to asbestos fibres. Asbestosis, a type of pulmonary fibrosis, is the result of inhaling high concentrations of fibrous asbestos dust, usually over many years, and a dose-response relationship has been established, i.e. the concentration of dust and duration of exposure determine the length of the interval between first exposure and the first recognisable signs of this disease. In 1968 the British Occupational Hygiene Society published standards for chrysotile asbestos dust, on the basis of which concentrations of less than 2 fibres/ml. averaged over 3 months, would be expected to reduce the risk of having early clinical signs of asbes-

tosis to less than 1%, over a working lifetime of 50 years.

Lung cancer has been associated with industrial asbestos exposure. From clinical observation over the past 40 years it would appear that this complication is more likely to occur in the presence of severe asbestosis. Controls which are successful in reducing the incidence of asbestosis should therefore reduce the associated risk of lung cancer. American epidemiological work indicates the increased carcinogenic effects from smoking for asbestos workers. Asbestos insulation workers in New York who smoke appear to have a greater chance of dying from lung cancer than insulation workers who are non-smokers exposed to the same levels of dust.

Mesothelioma is a malignant tumour of the pleura or peritoneum. Medical opinion is uncertain with regard to the dose-response relationship in mesothelioma, though it may be contracted as a result of a much lower level of dosage than required for asbestosis. By no means all mesothelioma cases seem to be associated with asbestos. Evidence in Britain suggests that in about 10-15% of cases where the information has apparently been complete, no history of exposure to asbestos has been recorded. A recent survey of cases reported in Canada, however, could only trace an association with asbestos in 20%. In those cases where asbestos exposure has been authenticated, the period which elapses between first exposure and the onset of symptoms may be between 20 and 50 years.

Asbestosis can result from exposure

to all commercially utilised types of asbestos, but is confined to those persons occupationally exposed to substantial amounts of asbestos dust. In Britain the number of confirmed new cases was 134 in 1969. This disease is more prevalent in workers employed in the insulation industry and in shipyards where the Asbestos Industry Regulations 1931 did not apply.

Where mesothelioma has been found to be associated with asbestos, the association has been mainly with crocidolite (blue asbestos). There are far fewer cases who have been exposed exclusively to chrysotile (this may account for the different incidence in the UK and Canada, which is the world's largest chrysotile producer). There are at present no authenticated cases of exposure to amosite or anthophyllite. The number of confirmed cases in Britain each year is about 60.

Mesothelioma has attracted considerable attention in recent years since it was first reported in association with exposure to N.W. Cape crocidolite in 1959. Some of these and some subsequent cases reported in London were of "neighbourhood" and domestic as opposed to occupational origin and it was assumed that these exposures had been to very slight concentrations of asbestos dust. Subsequent work, including dust measurements under conditions simulating some of the exposures described, has shown that these cases could well have been examples of considerable exposure. For example, in 1930 or earlier, a London woman brushing down her husband's dusty

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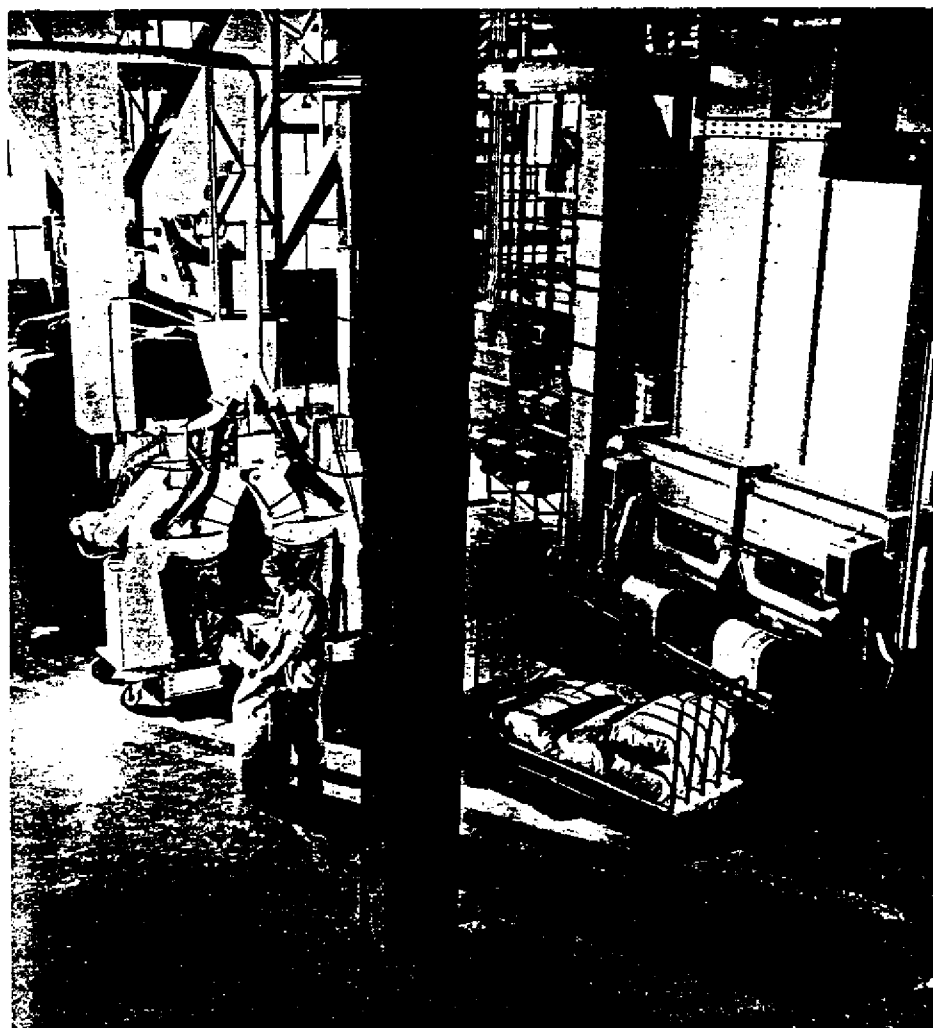
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44
Portable suction equipment
for use when drilling asbestos
insulation board.
Photo: Owen Lawrence,
London.



45
Circular saw fitted with
suction equipment.



46
Dust free storage and
bagging of asbestos fibres.
Photo: Walter Nurnberg,
London.

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overalls on his return from work could well have been exposed to a far higher concentration of dust than has been permitted since 1931 in the factory where he was employed.

In South Africa more cases have now come to light in crocidolite mining areas of the N.W. Cape, but none have been confirmed among people exposed in the crocidolite mining areas of the Transvaal. No authenticated cases have been found among people exposed exclusively to amosite, which is mined in the same areas of the Transvaal and which has physical characteristics very similar to those of Transvaal crocidolite. This difference may be because blue fibre from the N.W. Cape is about 3 times finer in diameter than Transvaal blue and therefore more likely to reach the lung depths and penetrate to the pleura because of its sharp needle-like structure. Chrysotile fibres, which are long and curly, are intercepted in the bifurcations of the broncheolar subdivisions and amosite and crocidolite from the Transvaal do not penetrate as deeply because of their larger fibre diameters. This is a possible explanation of the means whereby certain fibres reach the pleura, but does not explain how the peritoneum is involved, except

through further penetration through the diaphragm. There is no clinical or experimental evidence associating peritoneal mesothelioma with ingestion.

It is important to realise that the cases of asbestosis and mesothelioma being reported today are the result of exposure many years ago. There is a long latent period between first exposure and the first recognisable symptoms. These cases date back to a time when controls were not as effective as they are today in Britain. The Asbestos Regulations 1969 are now applied not only to asbestos factories, but to any occupation in which employees are exposed to concentrations of asbestos dust liable to endanger their health. Approximately 40 to 50% of the cases being diagnosed now are the result of work in the insulation contracting industry, which can involve very dusty jobs carried out in confined and badly ventilated spaces. Insulation work is subject to the Asbestos Regulations 1969, but was not adequately covered by the 1931 Regulations.

Acceptable hygiene standards are clearly set out in Technical Data Note 13 issued by H.M. Factory Inspectorate in the Dept. of Employment. There are many occupations to

which the substantive provisions of the Regulations would not apply, because they do not give rise to dust above the recommended levels. Examples of these might be the handling of asbestos-cement sheets, the fitting of most asbestos-based packings and jointings, and the bonding of brake and clutch linings. The range of such applications is being steadily extended as more products, particularly in asbestos textiles, are produced in dust-suppressed grades.

Thus the essence of the British approach is to impose controls where dust levels could be dangerous to operatives and to restrict the use of crocidolite to essential purposes. Controls work. It has been shown in the asbestos textile factory where we ourselves work that the implementation of measures for dust prevention and personal protection since the early 1930s has reduced the incidence of lung cancer among our asbestos workers wholly employed since then to a level no higher than that expected for the population as a whole. Epidemiological studies at another British factory have shown no excess mortality among asbestos workers involved only in low or moderate exposure to asbestos dust.



47
"Pastorale" by Pablo Picasso,
1946. Oils on asbestos cement,
120 x 250 cm.
From: Internationale
Asbestzement-Revue
(ac 28), October 1962.

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