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ANNALS OF INDUSTRY
Casualties Of The Workplace

By
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Part V

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ANNALS OF INDUSTRY

CASUALTIES OF THE WORKPLACE

V-A QUESTION OF THE PATIENT'S RIGHTS

FURNISHED with incontrovertible evidence that industrial disease was rampant in the United States, Congress passed the Occupational Safety and Health Act of 1970, authorizing the Secretary of Labor to promulgate mandatory standards for exposure to toxic materials so that no employee would suffer diminished health or life expectancy as a result of his work experience. This was a considerable undertaking, since American workers were being exposed to thousands of toxic substances, and since federal standards, often inadequate, existed for fewer than four hundred and fifty of them. Of all the industrial hazards, none had been studied more thoroughly or had been proved to be more critical than occupational exposure to asbestos. Mortality studies conducted by Dr. Irving J. Selikoff, the director of the Mount Sinai School of Medicine's Environmental Sciences Laboratory, and by Dr. E. Cuyler Hammonil, vice-president for epidemiology and statistics of the American Cancer Society, indicated that one out of every five deaths

among asbestos-insulation workers in the United States was caused by lung cancer; that almost one out of ten deaths among these men was caused by mesothelioma, a rare cancer of the linings of the chest or abdomen, which usually occurs many years after some, even if slight, exposure to asbestos; that another one out of ten deaths among them was caused by asbestosis, which is scarring of the lungs resulting from inhalation of asbestos fibres; and that nearly half of these men were dying of some form of asbestos disease. Yet in spite of the fact that the insulation workers constituted only a fraction of the total work force exposed to asbestos, a permanent standard for the mineral was not declared until June 6, 1972. At that time, Secretary of Labor James D. Hodgson and Assistant Secretary of Labor George C. Guenther, who was the director of the Department of Labor's Occupational Safety and Health Administration, decided that until July 1, 1976, workers could safely inhale air containing five asbestos fibres greater than five microns in length per cubic

centimetre of air, and that after that date the standard would be lowered to two fibres greater than five microns in length per cubic centimetre. (A five-micron fibre can be seen only with a microscope; a cubic centimetre of air is about a thimbleful; and in a normal eight-hour working day a worker will breathe in and out about eight million cubic centimetres of air.) Since the new ruling would permit workers exposed to asbestos to inhale and retain in their lungs as many as thirty million asbestos fibres of all sizes in a working day, it was considered grossly inadequate by almost everyone who had been studying the effects of exposure to the mineral. Indeed, during the previous six months, a two-fibre standard had been urged upon Secretary Hodgson as a minimum requirement by Dr. Selikoff and other members of the independent medical and scientific community, and by the A.F.L.-C.I.O.'s Industrial Union Department—an organization representing labor unions with several million members who had either direct or indirect exposure to asbestos. (Dr. Selikoff and the union people had also urged the Secretary to require work practices that would ultimately reduce asbestos exposure to almost zero.) In addition, the Department of Health, Education, and Welfare's National Institute for Occupational Safety and Health, or NIOSH—an organization set up under the 1970 Act to conduct medical research on industrial hazards and to provide the Secretary of Labor with criteria for setting new standards for toxic materials—had furnished Secretary Hodgson with a carefully researched asbestos-criteria document recommending that a two-fibre standard go into effect within two years, and informing him that such a standard was attainable with existing technology. The NIOSH document stressed the fact that a two-fibre standard had been recommended by the British Occupational Hygiene Society, and set by the British Inspectorate of Factories—the Department of Labor's English counterpart—in 1968. Subsequently, NIOSH's recommendation for a two-fibre standard was upheld by a five-man advisory committee of Secretary Hodgson's own choosing. It is not known what prompted Secretary Hodgson to select the five-fibre standard, or why he decided to disregard data furnished by Dr. Selikoff and other leading

toxicologists, showing that disease could occur at the five-fibre level of exposure, and that even a two-fibre standard could be expected to prevent only the occurrence of asbestosis and not the development of asbestos-induced cancer.

It is believed, however, that he was striking a middle ground that he hoped would be acceptable to the asbestos industry, which—having its claims on information supplied by a medical-industrial complex consisting in part of consultants and researchers whose work was supported financially by various segments of the industry—had fought against the two-fibre standard on the ground that the cost of meeting it would drive many asbestos companies out of business and that the five-fibre standard was sufficient to protect the health of workers. In any case, the permanent standard for asbestos was the first ruling that the Secretary had made under his mandate to redefine occupational-safety-and-health regulations, so industry, labor, and the independent medical and scientific community viewed the ruling as an indication of how diligent the federal government would be in setting new standards for other hazardous substances. The reaction to Hodgson's ruling was strong. Sheldon W. Samuels, the director of Health, Safety, and Environ-

mental Affairs for the Industrial Union Department, declared that since the Secretary had failed to set a standard that would adequately protect workers, the Industrial Union Department would challenge his ruling in the courts. Dr. Selikoff was quoted in the *Times* as predicting that tens of thousands of workers exposed to asbestos would die unnecessarily early deaths because of the inadequate regulations, and that if the Occupational Safety and Health Administration showed the same disregard for essential precautions in setting standards for other toxic substances the working population of the nation would face an unparalleled disaster. As it happened, signs that the disaster predicted by Dr. Selikoff was already at hand had appeared only a few weeks before, when the White House issued "The President's Report on Occupational Safety and Health," describing what had been done to carry out the provisions of the 1970 Act in the year since it had been passed. President Nixon's report was addressed to Congress, and it contained a report from the Secretary of Health, Education, and Welfare, Elliot L. Richardson, who told the President that recent estimates indicated there were at least three hundred and ninety thousand new cases of disabling industrial disease in

the United States each year, and that there might be as many as a hundred thousand deaths a year from occupationally caused diseases.

In spite of these appalling figures, indications that the federal government was less concerned about the physical health of workers than about the economic health of industry appeared at around the same time, when word got out that the Occupational Safety and Health Administration had hired Arthur D. Little, Inc., a research-and-consulting firm based in Cambridge, Massachusetts, to perform an economic-impact study of the proposed two-fibre standard for asbestos. There were a number of disturbing factors about Arthur D. Little's involvement. Not only was there no provision in the Occupational Safety and Health Act requiring the Department of Labor to undertake a cost-benefit analysis before promulgating a health regulation but the study was apparently initiated in response to an executive policy handed down by President Nixon's Office of Management and Budget—an organization notably well disposed toward big business. In addition, it soon developed that even as Arthur D. Little was negotiating a contract with the federal government to conduct a cost-benefit analysis of the proposed two-fibre standard, it had urged Raybestos-Manhattan, Inc., a major producer of asbestos products, to move a plant from Stratford, Connecticut, to Mexico, where asbestos operations would be unhindered by any regulations that might be established in the United States. Moreover, when the report of the Arthur D. Little study, which had been directed by Dr. Donald W. Meals, was released, shortly after Secretary Hodgson declared his controversial standard, it turned out that the firm had solicited "guess-estimates" on the biological effects of a five-fibre standard, as compared with a two-fibre standard, from an eleven-man "expert health panel" that included only one medical doctor who had not been a paid consultant of, or whose investigations into asbestos-related disease had not been supported by, some segment of the asbestos industry, and that it had solicited "guess-estimates" on the economic impact of the respective standards from a panel of twelve men representing various asbestos-producing companies and from a committee of thirteen men representing private shipbuilding companies. Small wonder, then, that the A. D. Little report assured Secretary Hodgson that a five-fibre standard would adequately protect the health of asbestos workers, and that a two-fibre

standard would impose undue hardship on the asbestos industry and on shipbuilding companies. All this was simply another indication of how much influence the medical-industrial complex had acquired, and how deeply it had penetrated the workings of the government.

During the summer and early autumn of 1972, moreover, it became known in medical circles that the British Occupational Hygiene Society's two-fibre standard, which had been based on information supplied to the society by Dr. John F. Knox and Dr. Stephen Holmes, of the Turner Brothers Asbestos Company, Ltd., of Rochdale, England, might be open to question. New data published by Dr. Hilton C. Lewinson, who had succeeded Dr. Knox as chief medical officer of Turner Brothers, suggested that Dr. Knox and Dr. Holmes had furnished the society with information that appeared to understate by as much as tenfold the incidence of asbestosis among the Turner Brothers workers they had studied. The ramifications of this disclosure were staggering, for, if the British two-fibre standard was medically and scientifically invalid, so, by extension, was the proposed two-fibre standard in the United States, which was not even to go into effect until 1976. In addition to making an obvious mockery of Secretary Hodgson's five-fibre standard, this development presented the possibility that industry influence might have had an effect on official medical considerations concerning the problem of occupational exposure to asbestos in England. By this time, there could hardly be any doubt that such influence was at work in the United States. Indeed, the medical-industrial complex in this country appeared to be involved in nothing less than a blatant and pervasive effort to suppress and ignore medical information concerning asbestos and other hazardous substances that were estimated to be killing a hundred thousand workers a year, and to prevent any effective enforcement of the Occupational Safety and Health Act that might put an end to the slaughter.

IN the middle of October of 1972, I went to Washington to talk with Anthony Mazzocchi, the director of the Legislative Department of the Oil, Chemical, and Atomic Workers International Union, about some of the other health problems that were plaguing American workers. Mazzocchi's union had represented employees at the Pittsburgh Corning Corporation's asbestos-

isolation plant in Tyler, Texas, where Dr. William M. Johnson and Dr. Joseph K. Wagener, of NIOSH's Division of Field Studies and Clinical Investigations, had found atrocious working conditions and a critical health problem. Mazzocchi considered the Tyler situation a prime example of how the medical-industrial complex had for years ignored occupational-health data with no interference from key industrial-health officials at various levels of state or federal government. At a press conference held in Washington in February of 1972, he had harshly criticized Pittsburgh Corning and its medical consultant, Dr. Lee B. Grant, for ignoring the peril of workers at the factory, and had been equally bitter in condemning the Department of Labor's Occupational Safety and Health Administration for failing to enforce at the Tyler plant even the grossly inadequate standard of twelve fibres per cubic centimetre which was in effect when the Administration had conducted an inspection of the factory in late November of 1971. Over the past few years, during which Mazzocchi and his associates in the Legislative Department had been holding conferences for factory workers around the country, they had amassed and published, in a series of pamphlets entitled "Hazards in the Industrial Environment," a great amount of information on the effects of chemicals and physical agents on the health of working men and women. In gathering this information, they had compiled a large dossier of the names, affiliations, and activities of people who were involved in occupational-health matters, and so were known to have "the book" on the medical-industrial complex.

I had seen Mazzocchi at his press conference about the Tyler plant; a month later I had encountered him again in Washington at the public hearings on the proposed two-fibre standard, which were held by the Department of Labor; and in October, hoping to learn more about the workings of the medical-industrial complex in areas other than asbestos, I visited him and his assistant, Steven Wodka, at the union offices there. Mazzocchi, a blunt-spoken man in his middle-forties with unruly black hair, had been much on the go in the interval—flying here and there around the country—and looked tired.

"You've been studying the Tyler plant, which in many ways is a perfect example of the kinds of problems we face," he told me. "Tyler had all the elements—suppression of occupational-

health data, callousness on the part of those in positions of responsibility in industry and government, and danger not only for the workers but also for their families and the community at large—and yet you could be hearing much the same story about any number of factories in this country. You could be studying the Mobil Oil Corporation's refinery in Paulsboro, New Jersey, or the Kawecki Beryllco Industries factory in Hazleton, Pennsylvania, or any one of hundreds of other places where the health of workers either has been or is being needlessly endangered. I hardly know where to begin. In fact, I don't know where to begin. Steve, here, once stated the multiplicity of our problems by saying that members of our union don't get black lung, like coal miners, or brown lung, like cotton-textile workers, but rainbow lung, because they're exposed to so many toxic substances."

"Let's start with the Kawecki Beryllco plant in Hazleton," I said. "I've already heard something about the situation there."

Mazzocchi asked Wodka to pull out a file on KBI, as the company is known, and told me that the union had represented workers at the factory since the summer of 1969. "By August of 1970, it was apparent that much more information was needed concerning the hazards of beryllium, so the local union representatives initiated plans to hold a conference on the problem in mid-October," he said. "At that conference, the KBI workers told us that beryllium dust was contaminating the Hazleton plant, and that several deaths and current cases of lung disease among them were thought to be related to beryllium exposure." Mazzocchi went on to say that, armed with tapes of the conference, he travelled to Cambridge a few days later and met with Dr. Harriet L. Hardy, who was assistant medical director in charge of the environmental medical service at the Massachusetts Institute of Technology, an associate physician at Massachusetts General Hospital, and a renowned expert on beryllium poisoning. Upon hearing the tapes, Dr. Hardy expressed concern about the reports of conditions inside the Hazleton plant and pledged her assistance in analyzing urine samples of the workers there. "Shortly thereafter, an inspector from the Department of Labor conducted a survey of the plant," Mazzocchi said. "The inspection, which the local had requested some sixteen months earlier, was superficial—put it mildly. For example, no samples were taken to determine the amount of

beryllium dust in the air. The inspector did indicate, however, that better exhaust ventilation was required, so that men would not have to wear respirators on routine production jobs. He also criticized the plant for poor housekeeping procedures and for using an open dump for disposing of refuse contaminated with beryllium. The company was given until February 1, 1971, to correct these conditions, but a check with the Department of Labor in March revealed that no followup inspection had been performed to determine whether the company had complied."

Mazzocchi asked Wodka to continue the story of the Hazleton plant, since he had spent considerable time there in the fall of 1970 and the winter of 1971. Wodka—a man in his middle twenties, with brown eyes, curly hair, and a laconic manner—told me that he went to Hazleton in late November of 1970 to gather information on conditions in the KBI plant, and returned on December 8th to attend a union-management health-and-safety meeting. "When I questioned company officials on the unsafe procedures I had heard about, they offered to take me on a tour of the plant," Wodka said. "It proved to be an invaluable experience in assessing unsafe conditions, for almost everything I saw confirmed what the workers had told me. Inadequate ventilation equipment had allowed dust to pile up around machinery and to blow throughout the plant. Another serious problem was the company's excessive reliance on the use of respirators. Instead of installing proper ventilation equipment to reduce beryllium-dust levels, the company had simply designated some of the dusty sections of the plant as respirator areas. As a result, many workers were forced to wear respirators for long periods—a practice that is extremely difficult, if not downright impossible."

A couple of days later, Wodka said, he went to Cambridge to report what he had learned to Dr. Hardy. "She got on the phone immediately and rounded up a team of beryllium specialists to help us out," he continued. "They included Richard I. Chamberlin, an industrial-hygiene engineer at the Massachusetts Institute of Technology, who would sample beryllium-dust levels in the plant and study the ventilation system; Dr. John D. Stoeckle, an expert in industrial lung disease at Massachusetts General Hospital, who would conduct a symptom survey of all workers; Dr. Hosayoun-Kazemi, the chief of the pulmonary unit at Massachusetts Gen-

and Dr. Alfred L. Weber, a radiologist from the hospital, who would supervise a mass X-ray program and read and interpret the results. When I returned to Washington, I drew up a set of proposals for the next meeting of the union-management health-and-safety committee, on January 5, 1971. The chief provisions were that beryllium-dust levels in the plant be kept at or below the threshold limit value of two micrograms per cubic metre of air; that the union have the right to observe the company's dust-monitoring operations and have access to the results; and that the company finance a thorough industrial-hygiene survey of the plant, to be conducted by the team of specialists designated by Dr. Hardy, which Chamberlin had estimated could be accomplished at a cost of about twenty-one hundred dollars."

Mazzocchi continued the story by telling me that at the January 5th meeting plant officials informed him that they were not prepared to deal with such extensive proposals. "They said they would have to consult higher authority in KBI," he said. "As things turned out, we weren't able to arrange another meeting with the KBI people until March 10th. In the meantime, urine samples were collected from five workers and sent to Dr. Hardy, who had them analyzed at M.I.T. by George W. Boylen, Jr., an expert in industrial-hygiene chemistry. He found varying amounts of beryllium in all the samples, and both he and Dr. Hardy said they believed that beryllium would not be present in the urine of men who were exposed at or below the level of two micrograms per cubic metre of air—the standard recommended by the American Conference of Governmental Industrial Hygienists. As a result, the union local voted unanimously that each of the two hundred and seventy-eight members working in the Hazleton plant support the cost of our health proposals by paying a dollar a month surcharge on membership dues."

Mazzocchi went on to tell me that Wodka conducted an investigation of the State of Pennsylvania's role in enforcing health regulations at the Hazleton plant. "It turned out that the state people had more data on the plant than anyone else," Mazzocchi said. "The quality of the data, however, was another matter. When Steve telephoned Edward Baier, who was then director of the state's Division of Occupational Health and is now the deputy director of NIOSH, he was told that there had been no cases of beryllium disease from

the Hazleton plant. Later, we learned that in an annual screening program of KBI workers the Pennsylvania people had been using X-ray equipment that, according to Dr. Hardy, was inadequate for detecting beryllium disease. During his telephone conversation with Baier, Steve learned that the state had taken beryllium-dust counts during its inspections of the Hazleton plant. However, Baier told Steve that he considered the data confidential, and felt that their release to the union would damage the relationship between the state and the company."

Wodka said that he then went to Harrisburg to meet with Baier. "During the meeting, Baier and his staff admitted that they had recently taken readings of beryllium-dust levels in the Hazleton plant, and in some sections they were ten times the recommended standard," Wodka said.

"Baier assured me that each man in these contaminated areas had been told to wear a respirator, but he also acknowledged that such protection should be used only for interim control. I asked him why the state had not forced the company to comply with the recommended beryllium standard, and he told me that the KBI people were co-operating. When I again requested access to the state's inspection reports, Baier promised that a copy of the most recent survey, which had been conducted in January, would be sent to the company for transmittal to the union."

Mazzocchi then told me that at the March 10th meeting of the union-management health-and-safety committee, C. Dale Magnuson, the industrial-relations manager for KBI, rejected the union's proposal for a survey of the plant by the team of industrial-hygiene experts that Dr. Hardy had assembled. "According to Magnuson, the company already had a good industrial-hygiene department; and there was no need to bring in another group," Mazzocchi said. "Wodka then asked the KBI people if the State of Pennsylvania had forwarded them a copy of its January inspection for transmittal to the union. They replied that the report had not come in. When Steve produced a letter from Baier stating that the report had been sent to them on March 5th, the KBI people admitted after all that they had received the copy marked for transmittal to the union, but said that they felt under no obligation to turn it over."

The only counterproposal made by the KBI people at the March 10th

meeting, Mazzocchi said, was that they would give the union a quarterly report of the company's monitoring data on beryllium-dust levels. "On April 29th, we went back to Hazleton to get the first of these reports, taking along Chamberlin, from M.I.T., in a consulting capacity. At the meeting, the KBI people were represented by Magnuson; Edmund Velten, one of their vice-presidents; and James Butler, the assistant to the president. The company's report showed only one area in the plant where there were excessive levels of beryllium dust. Upon reviewing the data, however, Chamberlin said that it was difficult for him to interpret the figures without knowing something about the layout of the plant. Velten then suggested a quick tour, to which we readily agreed. At the end of the tour, Chamberlin said he had seen enough to convince him that the company's interpretation of its data on beryllium-dust levels did not give a true indication of the potential hazard in the plant. Then Steve produced copies of the January inspection conducted by the State of Pennsylvania's Division of Occupational Health, and two earlier state inspections of the plant as well, which Baier had finally decided to release the day before. The reports showed serious violations of both state and federal beryllium standards in four specific areas of the factory, going back to 1969. At that point, Velten and the other KBI officials agreed to our key proposal that a union-designated investigation team be allowed to conduct industrial-hygiene and clinical surveys at the plant, and that the costs be shared equally by KBI and the union. In May, we got the Pennsylvania people to agree to take X-rays using equipment adequate for the detection of beryllium disease of all the workers in the Hazleton plant, and to allow Dr. Weber to assist in the interpretation of the X-rays. In mid-September, an inspection of the Hazleton plant conducted by the Occupational Safety and Health Administration still showed excessive levels of beryllium dust. The Administration fined KBI six hundred dollars and gave it a month to clean things up. Then, in November of 1971, Dr. Kazemi, who is one of the world's leading experts on the detection and diagnosis of beryllium disease, conducted a medical survey of the Hazleton workers. Dr. Kazemi found that, out of two hundred and nineteen workers, twenty-five had symptoms possibly related to beryllium disease and seven of these men had lung abnormalities of such magnitude that they shouldn't have been working. Since then, four of



the seven have been definitely diagnosed as having beryllium disease. In addition, two other men from the plant, who had been examined at Massachusetts General, were diagnosed as suffering from the disease."

"What happened as a result of the fine and the date for cleaning things up?" I asked.

Mazzocchi gave a short, harsh laugh. "As of this date, more than a year later, the Administration people haven't seen fit to make a followup inspection of the Hazleton plant," he told me. "No doubt they assume the KBI people have complied with their order. Sounds like Tyler all over again, doesn't it?"

AFTER a short coffee break, Mazzocchi said, "Now let me tell you about the Mobil refinery in Paulsboro, which is just southwest of Camden. It employs about a thousand workers, and it manufactures a whole spectrum of oil products, including heating oil, lubrication oil, gasoline, and aviation fuel. For a long time, members of our Local 8-831 had been complaining about health-and-safety conditions there, and on October 11, 1971, we filed a complaint with Alfred Barden, acting regional administrator

of the Occupational Safety and Health Administration in New York City, requesting an imminent-danger inspection of the facility. The petition presented Barden with a partial list of health hazards at the refinery, including exposure to asbestos, sulphuric-acid fumes, phenol fumes, carbon-monoxide gas, tetraethyl lead, caustic soda, benzene, cumene, carbon tetrachloride, and chlorine. Since the Administration's regulations permit employees to request that a third party accompany its own representatives on walk-around inspections, the local asked for Steve Wodka, who had assisted them in filing the complaint. The first imminent-danger inspection began on October 15th, resumed on the 19th, and lasted through October 22nd, and Steve's effect on it was soon evident. Even the inspectors remarked that he provided a valuable extra set of eyes during the walk-around. On the other hand, the Mobil people grew increasingly irritated by his presence—so much so, in fact, that on October 22nd the plant manager told Steve that he had to have him removed from the premises."

Wodka then described some of the conditions that were discovered during the first part of the inspection of the refinery. "We found workers installing asbestos insulation, similar to the prod-

uct manufactured in the Tyler plant, on boilers and pipes in various areas of the plant," he said. "In the asbestos shop, where the insulation was cut to size, the men were wearing surgical-type paper masks provided by the company, which are virtually useless for protection against toxic dusts. Moreover, there was absolutely no ventilation equipment in the cutting shop. Elsewhere in the refinery, we found places where men were being exposed to toluene [an aromatic compound similar to benzene], to excessive noise, to welding fumes, and to hydrogen-sulphide gas—a highly toxic substance that is given off in the sulphur plant, where sulphur is removed from the crude oil."

Wodka went on to tell me that when the inspection resumed, on November 8th, he was denied entry to the refinery. "I was told by John Kearney, the assistant regional administrator, that a decision had been made to bar me from accompanying the walk-around any farther," Wodka said. "As a result, I left the plant, under protest. The inspections continued intermittently for several more weeks, but their quality deteriorated, for by giving management advance notice of the areas they wished to tour, the inspectors also gave management an opportunity to reduce operations that were generating harmful fumes and dust. In this way, the Mobil people were able to dominate the inspection process. As a result, the imminent-danger inspection of the Paulsboro refinery was an almost total failure. Take the problem of exposure to asbestos. The Administration failed to issue a citation for excessive asbestos dust, yet when Dr. Selikoff examined and X-rayed nineteen workers who were employed at the refinery as welders, pipe-covers, boilermakers, and bricklayers, he found that more than half of them showed X-ray abnormalities consistent with asbestosis. When the Administration, on January 28, 1972, issued citations to Mobil, they carried with them fines totalling seventy-three hundred and fifty dollars for three hundred and fifty-four safety-and-health violations, or about twenty dollars per violation. Only twelve of the violations involved occupational-health standards, one of which was for an unsanitary water cooler."

Mazzocchi said that similar performances by the Occupational Safety and Health Administration had occurred in recent months at a chemical plant in Alabama and at an oil refinery in Kansas. "These are just a few of

the many instances in which the Administration has failed to enforce the provisions of the Occupational Safety and Health Act," he said. "By the way, did I tell you that when the Administration people fined KBI six hundred dollars for excessive beryllium dust in the Hazleton plant they also fined the company the grand total of six dollars for allowing food to be eaten and stored where toxic materials were present? That was just a few weeks after they fined Pittsburgh Corning the sum of two hundred and ten dollars for so-called 'nonserious violations' at the Tyler asbestos plant. Such fines are ridiculous, of course, but the Administration people don't stop there. They rub salt into the wound by being secretive with what, under law, is public information. We face delays and denials practically every time we ask them for copies of citations, notice of proposed penalties, and inspectors' reports of plant surveys. And, remember, we're trying to exercise the rights of our hundred and eighty thousand-old members through an extensive union bureaucracy. Imagine what the chances are for unorganized workers, who account for seventy-five per cent of the total labor force in this country!"

At this point, I asked Mazzocchi if he had ever heard of Dr. Mitchell A. Zavon, Assistant Health Commissioner for Cincinnati.

"Yes, I've heard of him," Mazzocchi replied. "Why do you ask?"

"Because I understand he has recently voiced opposition to some proposed city regulations that would ban the spraying of asbestos insulation in building construction."

"We have a whole file on Dr. Zavon," Mazzocchi said. "I'll have it Xeroxed for you: In 1969, the House Committee on Government Operations wrote a report on Dr. Zavon's activities with regard to the No-Pest strip, manufactured by the Shell Chemical Company, a division of the Shell Oil Company. According to the report, Dr. Zavon had been a consultant to Shell Chemical during a six-year period—1963 to 1969—when he was also a consultant to the Department of Agriculture's Pesticides Regulation Division, which had registered the insecticide strip for use in restaurants and homes. During that time, Dr. Zavon conducted tests for the company which showed the strips to be safe. When it was demonstrated later that the strips could leave unsafe chemical residues on exposed food, the Department of Agriculture required that they bear a warning label. In the end, the De-

partment informed the Committee on Government Operations that it was referring questions of possible conflict of interest involving Dr. Zvon to the Department of Justice. Nothing came of it, however."

WHEN I left Mazzocchi's office, I was carrying a manila envelope that contained the file on Dr. Zvon and copies of letters, petitions, inspections, and surveys relating to KBI's Hazleton plant and Mobil's Paulsboro refinery. On the plane back to New York, I read the report on Dr. Zvon, which substantiated what Mazzocchi had told me. (Later, I learned that in March of 1973 NIOSH awarded a contract for \$205,873 to the Agatha Corporation—a private medical consulting firm headed by Dr. Zvon—for developing health criteria on carbon tetrachloride, chloroform, ethylene dichloride, methylene chloride, tetrachloroethylene, and 1, 1, 1-trichloroethane, which can be synthesized from precursor chemicals obtained from petroleum.) I also glanced through the annual stockholders' report put out by KBI in 1971. It was full of handsome photographs and interesting statistics. It listed principal plants in Hazleton, Boyertown, and Reading, Pennsylvania, and in Wenatchee, Washington. It listed company subdivisions and subsidiaries in Boston; Springfield, Oregon; Revere, Pennsylvania; Thomaston, Connecticut; Yonkers, New York; and Palisades Park, New Jersey. And it listed international operations in France, Germany, the Netherlands, and Great Britain. In a letter to the shareholders, dated March 2, 1972, and signed by Joseph C. Abeles, chairman of the board, and by Walter R. Lowry, president, there was this paragraph:

No industrial enterprise today can afford to ignore the growing insistence upon clean air, clean water, and safe, healthful places of work as manifested in antipollution and job safety and health legislation. Considerations of environmental quality which have prompted us to make substantial expenditures on equipment and staff to control pollution and promote occupational health have, in our view, assumed a permanent place in the conduct of a business such as KBI's. We expect to continue to invest in environmental quality to preserve the gains we have made and take advantage of improvements in control technology as they become available.

A few days later, in the October 29, 1972, edition of the *Times*, I came across a story written by Henry Bigart which appeared under the headline "Lung-Disease Problem, Traced to

Beryllium Refinery, Plagues Hazleton, Pa." Bigart's article began:

In the grim year of 1956, when unemployment in this worn-out coal town hovered near 20 per cent and the region was one of the most depressed in Appalachia, there was general rejoicing when the Chamber of Commerce enticed a beryllium refining plant to settle four miles east of here.

There was only one discordant voice. Dr. Herman H. Feissner, Jr., who has a tiny walk-up office over a store in nearby Freeland, began cautioning his patients that it might be dangerous to work at the plant. Nobody paid much attention.

After saying that nine present or former employees of the plant were suffering from chronic berylliosis, which he described as "a rare disease that involves a slow but progressive—and apparently irreversible—deterioration of the lungs," Bigart returned to the subject of Dr. Feissner:

The tall, white-haired physician was graduated from Lehigh University in 1928 and from Jefferson Medical College, Philadelphia, in 1932. Now in his late sixties, he spends much of his time working with retarded children at the White Haven State School and Hospital.

However, he still practices medicine and among his recent patients were several beryllium refinery employees. "At least five," he said, had symptoms of berylliosis.

Dr. Feissner's first encounter with the beryllium industry came soon after Kawecki Beryleo acquired an old Lehigh Valley Railroad machine shop and roundhouse a few miles east of Hazleton and began converting beryl ore into beryllium. Kawecki Beryleo is a major company in the specialty metals field, with sales totaling \$70 million last year.

What disturbed Dr. Feissner was the knowledge that the corporation's plant in Reading, Pa., had been cited in several lawsuits charging negligence in exposing workers and nearby residents to unsafe levels of toxic dust.

Dr. Feissner said he was reproached by a local radiologist, Dr. Edgar L. Dessen, for "telling my patients a little too much about beryllium poisoning." Dr. Dessen was the leader of a Chamber of Commerce drive to bring new industry to Hazleton, a campaign so successful that unemployment is now down to 4.5 per cent.

Dr. Dessen confirmed that he had spoken to Dr. Feissner.

"He (Dr. Feissner) was telling people beryllium was a toxic material at a time the company was hiring men," Dr. Dessen said. "I felt it was unfair to people who wanted work. The plant was designed under Atomic Energy Commission specifications to keep irritants out of the air. With stringent precautions, the men would be properly protected."

Dr. Dessen said he had been a director of Kawecki Beryleo but did not stand for re-election this year. He said his time was taken up with other matters, including the chairmanship of the American College of Radiology's task force on pneu-

micromosis, a generic term for lung diseases caused by dust.

"I'm automatically suspect for having been a director," Dr. Dessen said, "but I consider myself a physician first."

When I later made inquiries about Dr. Dessen, I learned that, in addition to being a former director of KBI, he had been paid by the company for many years to read and take X-rays of employees at the Hazleton plant.

BY this time, I was beginning to understand how multiple and intricate were the reasons for the appalling casualty rate in the nation's workplaces, and how intertwined and pervasive were the activities of the medical-industrial complex, which was apparently bent on perpetuating the situation. What seemed more and more incredible to me as the months passed, however, was how such a situation could be—indeed, was being—tolerated at the highest levels of the federal government. Then, in the second week of November, Sheldon Samuels sent me a copy of a speech he had delivered before a joint session of the American Society of Safety Engineers and the National Safety Conference, in Chicago, on November 1st. After referring to Secretary Richardson's estimate of a hundred thousand deaths annually from occupational disease, Samuels addressed himself to the very question that had been troubling me.

"The economics of the situation are very simple," Samuels said. "Nearly half of the male blue-collar work force is afflicted with chronic—and no doubt partly work-related—diseases that are largely paid for by the worker and the community as a whole. Even if all of the identifiable costs were placed on the employer, we cannot always be sure that it would not be cheaper for the employer to replace dead workers than to keep them alive. It may even be profitable, if only dollars and cents are counted. In the case of chronic occupational disease, it may be cheaper for any nation to sacrifice a life that has already achieved peak productivity." Samuels went on to say that in recent months he had learned of at least four plants in which beta-naphthylamine and benzidine were used without proper controls by employers well aware of the probable death from cancer of a third or more of the workers exposed to them. "Because its priorities are determined on a crude cost-benefit basis, however, the federal government has refused to adopt standards for these

and seven other carcinogens," he declared.

Later in his speech, Samuels reminded his listeners that most of them worked for companies that were members of the United States Chamber of Commerce, the National Association of Manufacturers, and similar groups. "Read the record of the recent Senate and House oversight hearings of the committees on small business and labor," he said. "The Chamber says that workers face no greater risk than slipping in a bathtub. I only wish the situation were confined to the greedy bluster of such moral midgets. More serious is the subversion of government for profit. The National Association of Manufacturers has a full-time representative—office, phones, even a government expense account—at the very heart of the Occupational Safety and Health Administration operations. Political industry appointments are now made at the lowest levels. Industry standard-setting organizations, such as the American Society for Testing Materials, are attempting to bypass the standard-setting mechanisms in the [Occupational Safety and Health] Act. Industrial consultants dominate the contract route the federal government has taken in lieu of adequate staff in its standard-setting operations."

Of particular interest to me was Samuels' claim that industrial consultants were receiving contracts that in effect allowed them to usurp the standard-setting provisions of the 1970 Act—which had clearly intended that standards be developed and recommended by NIOSH and then promulgated and enforced by the Occupational Safety and Health Administration. I was already familiar with the activities of Arthur D. Little, Inc., in helping to set the questionable compromise standard for asbestos, and a few days earlier I had received information concerning another industrial-consulting firm under contract to the government, which had attempted to play a similar role. This had occurred when Mazzocchi called to suggest that I telephone Dr. Jeanne M. Stellman, who is assistant for occupational health to the president of the Oil, Chemical, and Atomic Workers, at the union's headquarters, in Denver. "Ask her to tell you the story about benzene," Mazzocchi said.

When I called Dr. Stellman, she explained, to begin with, that benzene—a colorless liquid—is produced as an integral part of refining oil and

gasoline. "It is probably handled by more than a third of the hundred and eighty thousand-old members of the Oil, Chemical, and Atomic Workers," she said. "And because benzene is also widely employed in the rubber, cement, and plastics industries, additional thousands of workers come into contact with it there. The trouble with benzene, as has long been known, is that it is a noxious poison, whose fumes, when inhaled, can induce blood changes—*anemia* and *leukemia*. Indeed, benzene is considered so dangerous that both the American National Standards Institute and the International Labor Office, which is part of the World Health Organization, have recommended that in any given volume of air, liquid, or solid material it should be present only in the ratio of ten parts per million—which comes to one-thousandth of one percent—with a ceiling of twenty-five parts per million. The American Conference of Governmental Industrial Hygienists, however, has recommended a standard whereby benzene can be present in a ratio of twenty-five parts per million, with a ceiling of fifty parts per million. I tell you all this as background to the fact that in order to develop criteria for the establishment of an official federal standard for benzene a twenty-three-thousand-dollar contract from NIOSH was awarded last May to George D. Clayton & Associates—an industrial-consulting firm in Southfield, Michigan."

On October 10th, Dr. Stellman continued, Clayton & Associates called an informal meeting of a benzene committee it had established. The meeting was held at the William Penn Hotel in Pittsburgh, where the Industrial Health Foundation, Inc., was then holding its annual conference. "As a member of the committee, I was invited to attend," she said. "Clayton & Associates called the meeting at that time and place simply because several of the committee's members were attending the foundation's annual conference. The idea was to have us give our opinion of a preliminary draft of the document on benzene criteria they had prepared for NIOSH. In addition to Clayton, Robert G. Keenan, vice-president and director of laboratories for Clayton & Associates, who was formerly head of the analytical laboratories at the Bureau of Occupational Safety and Health, and myself, the members of the committee included Howard L. Kusnetz, who was formerly director of the Bureau's Division of Occupational Injury and Disease Control and is now with the industrial-hygiene department



of the Shell Oil Company; Dr. Horace W. Gerarde, who was formerly chief toxicologist at the Esso Research and Engineering Company and is now at Fairleigh Dickinson University, in New Jersey; a representative of the Manufacturing Chemists Association and from the American Steel Institute; and Louis Beliczky, the director of industrial hygiene for the United Rubber, Cork, Linoleum, and Plastic Workers of America, who could not attend. When I read the preliminary draft of the benzene document prepared by Clayton & Associates, I was shocked to see that it was proposing a benzene standard identical to the one recommended by the Conference of Hygienists, which is two and a half times as high as the standard for benzene recommended by the American National Standards Institute and the International Labor Office. I told the committee that there was no way labor could live with such a standard. After a whole day of arguing, I finally walked out of the meeting, took a plane to Washington, and told Sheldon Samuels what was going on. Samuels promptly lodged a complaint with Dr. Marcus M. Key, the director of NIOSH, and, as a result, Clayton & Associates revised its preliminary document on benzene criteria, and has since recommended the more stringent standard for benzene of ten parts per million. The point is that the firm obviously called the Pittsburgh meeting in the hope of obtaining approval for a compromise standard for benzene which, while it might not adequately protect workers against anemia and leukemia, would not ruffle anyone's feathers."

SINCE Dr. Stellman's account of how Clayton & Associates had handled the NIOSH contract for developing criteria on benzene was closely followed by Sheldon Samuels' speech, I started to look into this aspect of the medical-industrial complex by examining a book entitled "NIOSH Contract and Research Agreements," which the Department of Health, Education, and Welfare had published in September of 1972. Without much difficulty, I determined that out of a hundred and forty-eight contracts for research on occupational safety and health which NIOSH had either let or renewed in the fiscal year 1972, eight had been awarded to Clayton & Associates. In addition to the contract for benzene, the firm had received contracts for developing documents on criteria for toluene, chromic acid, and trichloroethylene; for improving methodology for moni-

toring heat-stress standards; for writing a manual of good industrial-hygiene practices for metal welding and cutting; for setting up a basic course on particulate contaminants for presentation at the college level; and for publishing the third edition of a Public Health Service manual entitled "The Industrial Environment—Its Evaluation and Control."

As I read through the listings, I noticed that the project officer for the contracts awarded to Clayton & Associates for the development of criteria for benzene, toluene, chromic acid, and trichloroethylene was Dr. Charles H. Powell, who is NIOSH's assistant director for Research and Standards Development, at the Institute's headquarters, in Rockville, Maryland. Considering Dr. Powell's position, this in itself did not appear to constitute anything out of the ordinary. Nor was it particularly surprising that Dr. Powell was listed as project officer for five out of seven other contracts let by NIOSH, for the development of criteria documents on mercury, sulphur dioxide and sulphuric acid, toluene diisocyanate, fibrous glass, cadmium, arsenic, and parathion. What did seem somewhat unusual, however, was the fact that four of the five contracts for which Dr. Powell was project officer had been awarded to the consulting firm of Tabershaw-Cooper Associates, Inc., of Berkeley, California. (This firm had also received a fifth contract, for which Dr. Powell was not listed as project officer, for developing criteria on arsenic.) The first contract for which Dr. Powell was project officer was awarded to the Sequoia Group, also of Berkeley, for developing a parathion-criteria document. The contract for a criteria document on cadmium was awarded to the University of Cincinnati's College of Medicine. Thus, out of the eleven most crucially important contracts let by NIOSH in the fiscal year 1972—those for the development of criteria designed to enable the federal government to set specific standards for hazardous substances—Dr. Powell was listed as project officer for four contracts, totalling \$115,328, that had been awarded to Clayton & Associates, and for four contracts, totalling \$156,885, awarded to Tabershaw-Cooper Associates. In view of the way Clayton & Associates had handled the benzene-criteria document in Pittsburgh, I found this a bit disconcerting. And in view of the fact that Dr. W. Clark Cooper, a partner in Tabershaw-Cooper Associates, had published the results of two studies on exposure to fibrous glass in separate articles in

the *American Industrial Hygiene Association Journal*, and that both studies had been supported by the National Insulation Manufacturers Association, of which PPG Industries, the Owens-Corning Corporation, and Johns-Manville (all large producers of fibrous glass) either are or were members, I found it downright eerie, especially when I recalled that the trail of the medical-industrial complex, which I had been following for nine months, started at the Tyler asbestos plant, which was owned by the Pittsburgh Corning Corporation, a joint venture of PPG Industries and the Corning Glass Works, which, in turn, had established and still partly owns Owens-Corning.

But if the labyrinth in which the medical-industrial complex operated now seemed to branch into a new network of tunnels, a truly remarkable example of the elements making up this complex appeared in black and white several days later, when I received in the mail a copy of a book entitled "Industrial Environmental Health: The Worker and the Community," newly published by the Academic Press, of New York and London. The book, whose frontispiece proclaimed that it was sponsored by the Industrial Health Foundation, Inc., identified its editor as "Lester V. Cralley, Environmental Health Services, Aluminum Company of America, Pittsburgh, Pennsylvania," and listed its associate editors as "Lewis J. Cralley, National Institute for Occupational Safety and Health, Cincinnati, Ohio; George D. Clayton, George D. Clayton & Associates, Southfield, Michigan; and John A. Jurgiel, Industrial Health Foundation, Inc., Pittsburgh, Pennsylvania." The real and apparent tieups in this editorial roster were startling, to say the least, and they went so many different ways at once as to be almost too much to comprehend. However, after making a few telephone calls and toying with various possibilities, I came up with a way of looking at them which amounts to a riddle.

The riddle begins with the fact that Lester V. Cralley, of the Aluminum Company of America, is a twin brother of Dr. Lewis J. Cralley, who in 1970, while he was director of the Bureau of Occupational Safety and Health's Division of Epidemiology and Special Services, rejected a proposed study of the biological effects of coal tar-pitch volatiles on workers in the aluminum industry (coal tar-pitch volatiles being cancer-producing agents to which thousands of coke-oven workers are

exposed) on the ground that it was not presented as an industry-wide study, an action that was reversed by the new people in NIOSH, who approved a study of the effects of coal-tar-pitch volatiles on aluminum workers for the fiscal

1973, which study was temporarily shelved at NIOSH headquarters when some aluminum-industry officials voiced objections to not having been consulted during the planning stages of the investigation, an event that appeared to repeat the previous action taken by Lewis J. Cralley, who, now retired from government service, participated in writing up the health effects of benzene as a paid consultant to Clayton & Associates, which is the firm that received a hundred-and-sixty-thousand-dollar contract from NIOSH to produce the third edition of "The Industrial Environment—Its Evaluation and Control," not to be confused with "Industrial Environmental Health: The Worker and the Community," which was sponsored by the Industrial Health Foundation, Inc., of Pittsburgh, where George D. Clayton and Robert G. Keenan, of Clayton & Associates, called a meeting of the firm's committee on benzene in order to propose an inappropriate and later discredited compromise standard for benzene, at the Hotel William Penn, on October 10,

2, which was the very time and place of the annual meeting being held by the Industrial Health Foundation, Inc., which employs John A. Jurgiel, an associate editor of "Industrial Environmental Health: The Worker and the Community," and also employs Dr. Paul Gross, who, in addition to having testified for Johns-Manville in a number of workmen's-compensation cases, is the director of research laboratories of the Industrial Health Foundation, Inc., which is a new name for the old Industrial Hygiene Foundation of America, Inc., the self-styled "association of industries for the advancement of healthful working conditions" that, entirely financed by industry, including Johns-Manville, was retained by Pittsburgh Corning in the summer of 1963 to evaluate the asbestos-dust hazard at its newly acquired plant, in Tyler, Texas, where, during the next eight years, several more evaluations of the hazard were made, including two by the Bureau of Occupational Health's Division of Epidemiology and Special

ices, which showed airborne asbestos-dust levels at the Tyler plant to be grossly out of control, a fact that was not only not made known to the men who worked in the plant—many of whom had inhaled asbestos dust for

years without even respirator protection—but never evaluated in terms of the incredible disease-and-death hazard it posed for these men by anyone in the Division of Epidemiology and Special Services, including its director during this period, Dr. Lewis J. Cralley, who, as associate editor of "Industrial Environmental Health: The Worker and the Community," wrote a section of the book entitled "Epidemiologic Studies of Occupational Disease," containing a five-page chapter on asbestos that described in detail some studies of disease among asbestos workers conducted by Dr. John Knox and Dr. Stephen Holmes, of the Turner Brothers Asbestos Company, who later furnished the British Occupational Hygiene Society with data that appear to have underestimated by as much as tenfold the incidence of asbestosis among the Turner Brothers workers, and by Dr. John Corbett McDonald, of McGill University, in Montreal, whose research on mortality among asbestos miners and millers was financially supported by the Quebec Asbestos Mining Association, but that failed to mention either the study showing the disastrous mortality experience of the asbestos-insulation workers conducted by Dr. Selikoff and Dr. Hammond or Dr. Cralley's own unaccountably uncompleted study showing an appalling rate of death from asbestos disease among asbestos-textile workers, all of which, in turn, was accepted for publication by his brother, Lester V. Cralley, assistant director of Environmental Health Services of the Aluminum Company of America, who is the editor of "Industrial Environmental Health: The Worker and the Community," which is the book that inspired the riddle.

SHORTLY before Thanksgiving, I telephoned Dr. Johnson, at NIOSH's Division of Field Studies and Clinical Investigations, in Cincinnati, and asked him to tell me about a survey that he and some associates from the division had conducted in October at the Allied Chemical Corporation's plant in Buffalo. "We believe that there are still some problems with the company's benzidine operation, and that there are major problems with its dichlorobenzidine operation, which is a relatively open system," Dr. Johnson said. "The Allied Chemical people have chosen to treat dichlorobenzidine, which has been proved to be carcinogenic in test animals, as a toxic substance—not as a potential human carcinogen, as has been recommended by the English, who say there is no known safe level of

exposure to dichlorobenzidine, and the American Conference of Governmental Industrial Hygienists, who say that there should be an absolute minimal exposure to that chemical. For this reason, we're particularly concerned about employees at the Buffalo plant, who have had past exposure to beta-naphthylamine and benzidine, and who are currently being exposed to dichlorobenzidine. Incidentally, I have just come back from North Haven, Connecticut, where I talked with industrial hygienists from the Upjohn Company. In 1962, the Upjohn people bought a plant in North Haven that was owned by the Carwin Company, which had been a manufacturer of benzidine since the late nineteen-forties. The Upjohn people discontinued the benzidine operation in 1963, and their hygienists told us the other day that there had been no problems among the workers. However, we then made a check at the Connecticut State Tumor Registry, in Hartford, and discovered that there had already been six deaths from bladder cancer among workers employed at the old Carwin plant. For this reason, we are concerned by the fact that one hundred and seventy-one employees of the plant, whose onset of exposure to benzidine, dichlorobenzidine, and other aromatic amines occurred more than sixteen years ago, are no longer employed there, and are consequently not included in any existing program of medical surveillance."

Dr. Johnson went on to tell me that on November 9th he had addressed a meeting of the National Tuberculosis and Respiratory Disease Association, in Houston, where he presented some new information concerning the men who worked at Pittsburgh Corning's asbestos plant in Tyler. "Using data from Dr. Selikoff's and Dr. Hammond's mortality study of the nine hundred and thirty-three men who worked at the Union Asbestos & Rubber Company's Paterson, New Jersey, factory between 1941 and 1945, where exposures were similar to those incurred at Tyler, we now estimate that there will be between one hundred and two hundred excess deaths from asbestos-related cancer among the eight hundred and ninety-five men who worked at the Tyler plant," Dr. Johnson said. ("Excess deaths" are deaths beyond the number that the standard mortality tables would project.) "Late last summer, I sent memorandums to various regional administrators of the Occupational Safety and Health Administration, giving the names and addresses of other asbestos plants where I had reason to suspect that, because of data we had

found buried in the files, there were problems of overexposure that should be investigated. I have since been informed by one of the assistant directors at NIOSH headquarters, however, that such memos could constitute an embarrassment to our director, Dr. Key, who is apparently anxious to maintain an image of NIOSH as a pure-research agency. In effect, I have been cautioned against alerting the government's enforcement agency to situations where there might be a disease-and-death hazard. "I now intend to leave NIOSH at the end of June, when my tour of duty with the government is over, because I've come to the conclusion that I'll be better able to function as a medical doctor in some other atmosphere."

I called Dr. Selikoff in December and asked him to comment on Dr. Johnson's estimate of future mortality among the Tyler workers, and he told me that he thought the estimate would turn out to be too low. "It must be remembered that only thirty-one years have passed since the onset of exposure among the men who went to work at the Paterson factory," Dr. Selikoff said. "It must also be remembered that the excess risk of lung cancer in men exposed to asbestos increases year by year. For example, a man at twenty-five years from onset of exposure has an increased risk over a man at ten years from onset. This risk is greater at thirty years, and even greater at forty. On the basis of the mortality study of the Paterson workers, I expect a dismal future for many of the men who worked in the Tyler plant. In fact, I anticipate that there will be a hundred and fifty excess deaths among them from lung cancer, fifty excess deaths from mesothelioma, forty-five excess deaths from cancers of the colon, rectum, stomach, and esophagus, and fifty excess deaths from asbestosis. In other words, almost three hundred, or roughly a third, of these men will probably die unnecessarily early deaths."

DURING the early part of 1973, occupational-health problems besides those associated with asbestos began to receive increasing public attention. On January 3rd, the Buffalo *Courier-Express* carried an article stating that chemicals used at the Allied Chemical plant in Buffalo had been implicated in a dozen recent cases of cancer, some of them fatal, among workers in the factory. On December 29th, a petition had been filed with the Occupational Safety and Health Administration by the Nader Health Research Group and the Oil, Chemical,

and Atomic Workers International Union requesting that a zero level of exposure for ten carcinogens be set through a temporary emergency standard to be issued under the authority of the Occupational Safety and Health Act. A press release issued on the same day read, in part:

Approximately 100,000 American workers die each year as a result of occupational diseases. As more is learned about the origins of cancer, it becomes clear that thousands of worker deaths are caused by exposure to carcinogenic chemicals in the workplace.

The Health Research Group and the Oil, Chemical, and Atomic Workers Union are thus petitioning the Department of Labor to promulgate emergency temporary standards to eliminate human exposure to the following 10 cancer-causing chemicals in order to protect the lives and health of American workers:

- 2-Acetylaminofluorene
- 4-Aminodiphenyl
- Benzidine and Its Salts
- Bis-Chloromethyl Ether
- Dichlorobenzidine and Its Salts
- 4-Dimethylaminoazobenzene
- Beta-Naphthylamine
- 4-Nitrodiphenyl
- N-Nitrosodimethylamine
- Beta-Propiolactone

When I telephoned Dr. Johnson toward the end of the month and inquired about these developments, he informed me that on January 24th he had called Dr. Albert J. Rosso, who is associate industrial-hygiene physician at the Buffalo office of the New York State Department of Labor's Division of Industrial Hygiene, and that Dr. Rosso had revealed that no followup inspection of the Allied Chemical plant had been conducted by the state since the NIOSH survey in October, which showed that men working in the factory were at risk because of exposure to benzidine and dichlorobenzidine. On February 9th, the Assistant Secretary of Labor published a notice in the *Federal Register* acknowledging receipt of the petition on the ten carcinogens, and requesting additional information from interested parties. In response to the request, fifty written comments were received during the next few months. Some of them were rather interesting. Dr. Harold Golz, the director of medical-environmental affairs for the American Petroleum Institute, said that the petition should be denied, on the ground that the proposed rules were "unrealistic, technically unfeasible, and inconsistent" and that "zero tolerance is a philosophical concept and an objective that is neither achievable nor necessary." The Benzidine Task Force of the Synthetic Organic Chemical Manufacturers Association asserted that workers were being adequately pro-

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tected, and then, curiously, went on to say that if tumors did occur they were removed "long before malignancy is expected to develop." Sam MacCutechem, corporate director for safety and loss prevention of the Dow Chemical Company, said that the suggested standard would serve as a harassment and would dilute present cooperative efforts between industry and government agencies. MacCutechem went on to say that studies related to bis-chloromethyl ether were in progress, and that, because of their importance and the impact they would have, the chemical should be removed from consideration until they were completed. Bis-chloromethyl ether was also much on the minds of people at the Rohm and Haas Company, in Philadelphia. Frederick C. Moesel, Jr., assistant secretary of the firm, said that exhaustive epidemiological studies on the chemical were under way, and that his company expected results showing a no-effect level well above one part per billion.

On May 3rd, having assessed the petition and the fifty written comments, the Administration issued an emergency temporary standard consisting of strict work practices regarding the manufacture and use of fourteen carcinogens, including bis-chloromethyl ether and the nine others that had been listed in the petition. According to the Administration, workers were being exposed to the fourteen chemicals, such exposure posed a grave danger to them, and the emergency standard was necessary to protect their health until permanent standards could be promulgated six months hence, as the law required.

The subject of bis-chloromethyl ether came to my attention again in the middle of June, when Samuels sent me a copy of an article entitled "Lung Cancer in Chloromethyl Methyl Ether Workers," which had been published in the May 24th issue of the *New England Journal of Medicine* by three Philadelphia physicians—Dr. W. G. Figueroa, of the Germantown Dispensary and Hospital's pulmonary-disease section; Dr. Robert Raskowski, of Temple University's School of Medicine; and Dr. William Weiss, of the Department of Medicine of Hahnemann Medical College. (Bis-chloromethyl ether is a contaminant by-product occurring with chemical reactions that take place in the production of chloromethyl methyl ether.) The article began by saying that in 1962 the management of a chemical-manufacturing plant employing about two thousand workers "became aware that an excessive number of workers suspected of having lung cancer were be-

ing reported in one area of the plant, and turned to a chest consultant, who recommended a program to establish the degree of risk by semiannual screening." This screening program, which included chest X-rays, was in progress the next five years, the article said, and during that time the plant management "made a careful investigation of the work histories in several men whose lung cancers developed while they were working in the area under suspicion, and concluded that the only common denominator was exposure to chloromethyl methylether (CMME)."

What action, if any, the plant managers took with regard to the conclusion they had reached by 1967 remains a mystery, for the article continued:

Management is as yet unable to provide exact information on the exposure of the employees to CMME. Further interest that CMME could be a carcinogen was stimulated by... a 44-year-old man admitted to Germantown Dispensary and Hospital in December, 1971, because of cough and hemoptysis. A detailed occupational history revealed that he was a chemical operator who had been exposed to CMME for 12 years. The patient stated that 13 of his fellow workers had lung cancer, and he suspected that this was his diagnosis. All had worked as chemical operators in the same building of a local chemical plant, where they mixed formalin, methanol, and hydrochloric acid in two 3800-liter kettles to produce CMME. During the process fumes were often visible. To check for losses, the lids on the kettles were raised several times during each shift. The employees considered it a good day if the entire building had to be evacuated only three or four times per eight-hour shift because of noxious fumes.

The article went on to say that when a retrospective investigation of the fourteen cases was made, by an examination of hospital records and autopsy results and by consultation with family physicians, it was determined that all the men had indeed developed lung cancer; that their age at diagnosis ranged from thirty-three to fifty-five; that the exposure of thirteen of them to CMME ranged from three to fourteen years; and that thirteen of them had died within twenty months of diagnosis. The article concluded that the data "strongly suggest that an industrial hazard is associated with CMME."

At that point, I put down the article, telephoned Samuels in Washington, and asked him if he knew which plant was referred to.

"Are," he said. "It's the Rohm and Haas factory in Philadelphia."

DURING the winter, some significant changes of personnel took place in the Department of Labor,

which were said to have been instituted under the direction of Charles W. Colson, special counsel to the President. In January, George Guenther's resignation as Assistant Secretary of Labor and director of the Occupational Safety and Health Administration was accepted by the White House—presumably because his performance had received some highly publicized negative reactions from organized labor. Guenther was replaced by John H. Stender, a former vice-president of the International Brotherhood of Boilermakers, Ironshipbuilders, Blacksmiths, Forgers, and Helpers, who was also a former Republican state senator in Washington. Then, in February, James D. Hodgson, who had resigned as Secretary of Labor to return to the Lockheed Aircraft Corporation as senior vice-president for corporate relations, was replaced by Peter J. Brennan, the president of the New York City Building and Construction Trades Council, who had organized the counterdemonstration of hardhat construction workers that disrupted the student peace rally at City Hall in New York on May 8, 1970. Early in March of this year, I learned from Samuels that President Nixon's Office of Management and Budget had plans for a reorganization of federal agencies which included a scheme for dismantling large parts of the Department of Health, Education, and Welfare and the Department of Labor, and merging them into a Department of Economic Affairs. "There is considerable speculation that this shuffle may be attempted without the consent of Congress," Samuels said grimly. "If it takes place, it will effectively do away with the separate roles that were envisioned for the Occupational Safety and Health Administration and NIOSH by the Congress when it wrote and passed the Occupational Safety and Health Act. It will also help to sweep under the rug the whole occupational-health scandal we've been trying to expose."

Since then, it seems, whatever plans the Office of Management and Budget had in mind for H.E.W. and the Department of Labor have been held in abeyance pending a resolution of the Watergate crisis. In May, however, NIOSH was transferred from H.E.W.'s Health Services and Mental Health Administration (which was dissolved) to its Center for Disease Control, as part of a decision by H.E.W. to reduce manpower and reorganize health programs. Some people saw this as a further downgrading of NIOSH, others as an attempt by H.E.W. to preserve

some semblance of a preventive-medicine program. In any case, Civil Service regulations regarding seniority deprived NIOSH of more than fifty of its six hundred and fifty employees. Since it already lacked sufficient funds and manpower to keep up with increased demands for research training, industry-wide safety-and-health studies, documents on criteria, and health-hazard evaluations, there were predictions of serious work backlogs and an attendant lowering of morale. In June, the confusion surrounding the future of NIOSH and its operations was compounded by Secretary Brennan, who requested support from the Office of Management and Budget for merging NIOSH with the Department of Labor. Commenting on the general situation in the middle of the month, Dr. Key, the NIOSH director, noted that all its activities would have to be curtailed, and that "the health and safety of the American worker is not going to be protected as much"—a rather chilling prediction in view of the fact that only the previous year Secretary Richardson had estimated that occupational disease killed a hundred thousand American workers each year.

Meanwhile, on April 4th, a hearing on the petition filed by the A.F.L.-C.I.O.'s Industrial Union Department and five trade unions for review of the Secretary of Labor's five-fibre standard for exposure to asbestos dust had been held in the United States Court of Appeals for the District of Columbia Circuit. In a brief for the petitioners, the Industrial Union Department argued that the Occupational Safety and Health Act had clearly required the Secretary to set a standard that would adequately protect the health of workers. The Industrial Union Department's case that the Secretary had not done so was based largely upon the integrity of the NIOSH document on criteria for asbestos, which had recommended that a two-fibre standard go into effect within two years. However, in the brief for the respondent—former Secretary Hodgson—there were two documents of startling origin which defended the Secretary's action in declaring a five-fibre standard for four more years. The first of these was a nineteen-page single-spaced critique of the conclusions and recommendations of the NIOSH criteria document, which had been submitted to Dr. Powell, an assistant-director of NIOSH, on January 11, 1972, by Dr. George W. Wright, a longtime plant consultant of Johns-Manville, who was then head of medical research at St. Luke's Hospital

in Cleveland, and who testified later that year in behalf of Johns-Manville (and against the proposed two-fibre standard) at the Department of Labor's public hearings. Curiously, Dr.

Wright's letter to Dr. Powell was submitted as part of the public record that the Department of Labor was required to compile in order to establish a permanent standard for asbestos but was only later submitted by Dr. Powell as an extra-record statement solicited by Assistant Secretary of Labor Guenther in order to justify the Department's controversial decision to delay the imposition of a two-fibre standard for four years.

The second letter in support of the government brief was an extra-record memorandum sent to Guenther by Dr. Key, on May 30, 1972—three days before Guenther signed the contested standard for asbestos—which, in effect, disavowed critical portions of the criteria document that had been prepared by Dr. Key's own staff, and under his direction. Dr. Key's memorandum to Guenther ended, "In summary, if your hearings and feasibility study indicate that a two-fibre-per-cubic-centimetre level is not achievable until four years hence, I would accept this as a reasonable health standard." Dr. Key

added three safeguards to his acceptance of the higher standard, including provisions that new plant construction be designed to meet a two-fibre level; that plants and operations that had already achieved a two-fibre level be required to maintain it; and that an anti-smoking campaign be required for workers exposed to asbestos. As it turned out, none of these safeguards were incorporated in the standard promulgated by the Department of Labor. However, the government did make liberal use of Dr. Key's memo ten months later, in its brief defending the Secretary of Labor from the petition brought against him by the unions.

Thus did the director and an assistant director of NIOSH take the astonishing step of compromising in *camera* their own asbestos-criteria document and its recommended two-fibre standard, which Secretary Richardson had assured President Nixon, less than a month before Dr. Key wrote his memo, was designed "to protect against asbestosis and asbestos-induced cancer... and to be attainable with existing technology." Moreover, as justification for this extraordinary administrative act, Dr. Powell chose to rely on an opinion provided by Dr. Wright, the Johns-Manville consultant (the company was later an *amicus*

curiae on the government side), and Dr. Key professed no qualms about feasibility data gathered by Arthur D. Little, Inc., a firm that not only had relied mainly upon information solicited from the asbestos industry, and from a group of medical doctors the vast majority of whom had conducted research on asbestos disease that was financially supported by the industry, but also was involved in a direct conflict of interest in behalf of the asbestos industry even as it prepared to undertake its study. No one knows for sure what could have motivated Dr. Key to sign this extraordinary memorandum, which turned out to have been written by Dr. Powell, but many people assume that he was reacting to pressure from his confreres in the Department of Labor, with which NIOSH might be merged. As for the Industrial Union Department's petition for review of the five-fibre standard, a final decision upon it is still pending. Most observers feel, however, that the fact that the integrity of the criteria document on asbestos has been questioned by its primary author has dealt a blow to the Industrial Union Department's case.

BY the late spring of this year, I had long since come to the conclusion that there would be no quick end to the resistance of the medical-industrial complex to action that would ameliorate the plight of workers exposed to toxic substances, or, for that matter, to the capacity of many key government officials to react with timidity and deceit whenever they were required to make decisions regarding occupational-health problems which might run counter to the interests of the corporate giants that had been supplying money and manpower to political administrations for decades. One of the chief difficulties in overcoming the traditional business-as-usual approach to industrial disease was simply that public opinion could not easily be aroused against the delayed carnage occurring in the workplace. In short, unlike the casualty figures of the Vietnam war, which for years had been reported weekly from a specific geographical area, specific or dramatic reporting of casualties from industrial disease could never be provided, for they were occurring years after the onset of exposure to toxic substances and among men and women who had been working in literally tens of thousands of shops and factories in every state of the union. For example, who would be likely to remember forty years from now that several hundred men in the hill country of East Texas

who had died of asbestosis, lung cancer, gastro-intestinal cancer, and mesothelioma had once been employed at a small insulation plant in Tyler owned by Pittsburgh Corning?

It therefore appeared that only an unusual disaster—a drama of vast magnitude—was likely to evoke the kind of public outrage that, as in the case of the war, would demand an end to the unnecessary slaughter. As things turned out, newspapers and television stations around the country were carrying stories about the possibility of just such a disaster—one that could affect the hundred thousand citizens of Duluth, Minnesota. Whether or not the Duluth situation proves to be truly catastrophic, it certainly serves to illustrate how a potential disaster can evolve without warning, and to suggest how other such disasters are bound to occur in the future if steps are not taken to curb industry's indiscriminate use of the environment as a private sewer. The Duluth story broke in the middle of June, when the Environmental Protection Agency announced that the public water system of the city, which derives its supply from Lake Superior, contained grossly excessive amounts of asbestos-like material. Upon further analysis, this turned out to be similar to amosite asbestos—the type that was handled in the Paterson and Tyler factories. The contamination of Lake Superior with asbestos had evidently begun in the middle fifties, when a new process was developed for extracting iron from the taconite-ore deposits in the nearby Mesabi Range. This process consisted in crushing the ore, grinding it in water to a fine muddy sand, and magnetically separating the iron from the wet slurry. In 1956, the Reserve Mining Company—a three-hundred-and-forty-million-dollar subsidiary of ARMO and Republic Steel—began using the new process at its plant in Silver Bay, a town on the lake about fifty miles northeast of Duluth, and also began dumping, through pipes and chutes, thousands of tons of pulverized waste tailings into the lake each day. (At the same time, large quantities of mineral dust began to be released into the ambient air through the smokestacks of the plant.) By the middle sixties, when the company was dumping sixty-seven thousand tons of waste tailings into the lake each day, a large green stain almost twenty square miles in area was spreading over the lake in the vicinity of Silver Bay—a stain that was thought for a long time to be composed of algae whose growth was stimulated by the dumping of the tail-

ings. In 1969, concerned about the condition of the water in the lake, the State of Minnesota went to court seeking to enjoin Reserve from the practice of dumping. In the course of the proceedings, it was established that the green color resulted not from algae but from light-scattering effect that was caused by sunlight shining on suspended particles. Then, in December of 1972, suspecting that asbestos might be present in the taconite ore mined for production, officials of the Minnesota Pollution Control Agency commissioned two geologists—Stephen Burrell, of the University of Wisconsin, and James Stout, of the University of Minnesota—to undertake a study of the situation. Over the next seven months, Burrell took samples of ore at Reserve's Peter Mitchell Mine, and when Stout analyzed them, asbestos-type material turned out to constitute about twenty per cent of the total. After the iron was separated from the ore, the waste tailings that were left contained an even greater percentage of this material. Thus, since the dumping had begun, it could be estimated that the waters of the lake had been polluted not only with about two hundred million tons of ore refuse but with tens of millions of tons of asbestos-type minerals. Small wonder that when the Environmental Protection Agency—which had instituted its own suit against Reserve in February of 1972—collected samples of the public water supply of Duluth and sent them to the Environmental Sciences Laboratory of the Mount Sinai School of Medicine, in June, to be analyzed they were found to contain approximately a hundred times as much asbestos-type fibre by weight per litre as any other water samples that had ever been analyzed there.

During May, preliminary results of the Burrell-Stout study were reported to officials of the E.P.A., in Washington, who, after mulling over their implications and the possible effects of their public disclosure (including the possibility of panic among the citizens of Duluth), furnished the information to the court, thus adding a new dimension to the original suit. At the same time, the E.P.A. asked Dr. Selikoff and Dr. Hammond to evaluate in sixty days the possibility of adverse effects upon the health of the citizens of Duluth. Shortly thereafter, United States District Court Judge Miles W. Lord, who was scheduled to hear the case against Reserve, requested Dr. Selikoff and Dr. Hammond to

conduct a preliminary study and report their findings to him within two weeks. Since no studies had ever been performed on people whose exposure to asbestos was purely by ingestion, Dr. Selikoff and Dr. Hammond, and Dr. William J. Nicholson, associate professor of community medicine at the Mount Sinai School of Medicine, and also a member of the staff of its Environmental Sciences Laboratory, undertook to determine the presence of asbestos fibres in the tissues of such people by comparing autopsy material from people who had lived all their lives in Duluth with autopsy material from asbestos workers who had been employed at the old Union Asbestos & Rubber Company's factory in Paterson. Because workers at that plant—and other asbestos workers as well—were known to have incurred three times as much gastro-intestinal cancer as people in the general population, the project appeared to be an urgent one.

Toward the end of June, Dr. Selikoff, Dr. Hammond, and Dr. Nicholson informed Judge Lord that because their initial studies showed that the autopsy material from Duluth had been prepared with formalin which had been diluted with water from the Duluth water supply, the material was contaminated with asbestos to start with, and thus made its analysis very much more complicated. For this reason, a proper evaluation of the potential health hazard to the residents of Duluth from drinking water contaminated with asbestos could not be made on short notice but would take many months of painstaking study and evaluation. As a result, the study continued through the summer and fall.

Meanwhile, the suits that had been brought against Reserve by Minnesota and the E.P.A. had been merged, and went to trial on August 1st in United States District Court, with Judge Lord presiding, and with the Justice Department (acting in behalf of the E.P.A., and joined in its action by Minnesota, Wisconsin, and Michigan, as well as by five environmental groups) contending that Reserve's discharge of taconite waste into Lake Superior posed a threat to public health and should be halted. Because of the complexity of the issues involved, most of the government's key witnesses were not called to the stand until the early part of September. One of the first of these was Dr. Nicholson, who testified that his analysis of water samples from Duluth showed that they contained very large

amounts of amphibole minerals. (Amphiboles are a complex group of silicate minerals that chiefly contain magnesium, silicon, and iron. Included in the group are five different varieties of asbestos, including crocidolite and amosite, both of which are known to have caused asbestosis, lung cancer, mesothelioma, and cancer of the gastro-intestinal tract in workers who inhaled their fibres.) When asked how many amphibole fibres someone might ingest from drinking a quart of water from the public water supply of Duluth, Dr. Nicholson testified that his analysis showed that a quart of Duluth water could contain anywhere from twenty million to a hundred million such fibres. Later in his testimony, Dr. Nicholson indicated that Reserve's operations might also constitute a serious air-pollution hazard, since his analysis of air samples taken in the vicinity of the company's plant in Silver Bay showed that they contained concentrations as high as eleven million amphibole fibres per cubic metre of air. (Anyone breathing such air could inhale more than one hundred million fibres in twenty-four hours.) Basing his conclusions on the air and water samples he had analyzed, on his research on people who had been occupationally exposed to asbestos, and on his knowledge of other research into the biological effects of asbestos which showed that asbestos-induced cancers usually took twenty years or more to develop, Dr. Nicholson stated that the situation resulting from Reserve's discharge of taconite waste constituted a serious public-health hazard. "If we waited until we saw the bodies in the street, we would then be certain that there would be another thirty or forty years of mortality experience before us," Dr. Nicholson said. "We would have built up a backlog of disease over which we would have little control."

Dr. Nicholson was followed on the witness stand by Dr. Harold L. Stewart, who had been engaged in cancer research for the United States Public Health Service's National Cancer Institute since 1939, and who had been chief of pathology at the Institute from 1954 until 1969, when he retired. Dr. Stewart testified that in his opinion the amphibole fibres in the Duluth water supply constituted a carcinogen. "You give it to the infants," he said. "You give it to young children. This is a captive population. They not only ingest the water, it's virtually a food additive. Everything that's cooked is cooked in [asbestiform minerals]. All the sheets and the pillowcases and the clothes are laundered in the asbestos water. It



must be in the atmosphere. It must be floating around. The dryer that dries the clothes in the cellar must blow this out somewhere, I would assume. It's a carcinogen introduced through the domestic water supply into the homes people." Toward the end of his direct testimony, Dr. Stewart said that anybody who permits such a situation "must realize that he's condemning people to exposure to a carcinogen that may take their lives and probably will."

After Dr. Stewart's appearance, the government called Dr. Arthur M. Langer, the chief mineralogist and head of the physical sciences section at the Mount Sinai Environmental Sciences Laboratory, who testified that his analysis of fibres in samples of the Duluth water supply showed that half of them were of the amphibole variety, that approximately two per cent were identical with amosite asbestos, and that between four and five per cent were consistent with amosite. Dr. Langer also stated that almost half of the fibres found in the air samples taken in Silver Bay were either identical to or consistent with amosite asbestos in their chemical composition. Dr. Langer was followed to the stand by Dr. Wagoner, of NIOSH. A considerable portion of

Wagoner's testimony was devoted to the excessive amosite-asbestos dust concentrations that Dr. Johnson and others from the Division of Field Studies had found during their survey of Pittsburgh Corning's Tyler plant, in October of 1971, and to the critical occupational-health situation that had existed there. During this testimony, it was brought out that previous surveys of the Tyler plant, which showed gross abuses of good industrial-hygiene practices at the factory as far back as 1967, had been conducted under the direction of Dr. Wagoner's predecessor at the division, Dr. Cralley; that Dr. Cralley had reported the results of his findings to Pittsburgh Corning but not, insofar as Wagoner knew, to any federal regulatory agency; and that Dr. Cralley was at present a consultant for Reserve.

Dr. Wagoner was followed on the witness stand by Dr. Selikoff, who, during four days of testimony, proceeded to review the history of asbestos disease, the results of the major studies he biological effects of asbestos which had been carried out during the past forty years, and the results of the studies he and Dr. Hammond had conducted showing the disastrous mortality experience of asbestos workers at the Tyler plant and at its predecessor,

the Union Asbestos & Rubber Company's factory in Paterson. Dr. Selikoff went on to describe some preliminary findings of a study he is conducting of the relatives of men who had worked at the Paterson plant. He told the court that upon examining a hundred and fifteen people who had lived in the same house with workers at the plant (and who could, therefore, have been exposed to asbestos dust brought home on the workers' clothes), he found that thirty-nine per cent showed X-ray abnormalities, most of them in the form of lung scarring typically found among people who are occupationally exposed to asbestos. Dr. Selikoff also testified that he felt it was highly probable that ingestion of asbestos fibres was responsible for the fact that he had found a threefold increase in cancer of the gastro-intestinal tract among the asbestos workers he had studied.

In attempting to deny the government's charges, Reserve contended that the fibres found in the Duluth water supply were not caused by its disposal of taconite waste into Lake Superior, and that, in any case, the fibres were not of the same chemical type that had been found to cause cancer of the lungs and gastro-intestinal tract among asbestos workers. However, Dr. Selikoff testified that he strongly believed, on the basis of his experience and upon evaluation of all the data he had studied, that cancer was induced by the "size and shape of the particles rather than their exact chemical composition." Later, when asked if he had an opinion as to whether or not the presence of amphibole fibres in the Duluth water system constituted a health hazard, Dr. Selikoff replied that he thought it posed a distinct health hazard to the population of Duluth and to other populations drinking or using such water. "We will not know whether or not these particular circumstances will cause cancer until another twenty-five to thirty-five years have passed," Dr. Selikoff stated. "This is in my opinion a form of Russian roulette, and I don't know where the bullet is located." Upon further questioning, Dr. Selikoff testified that asbestos levels measured in the air at Silver Bay, less than half a mile from two schools, were about ten times as great as asbestos levels measured near sites where asbestos insulation had been used in building construction in New York City (a practice banned by the city as a health hazard in February of 1973); that the asbestos levels in Silver Bay were about the highest environmental levels he had ever seen; and

that people who might be breathing air containing such concentrations were, in his opinion, risking the development of mesothelioma.

At Judge Lord's request, a tentative list of witnesses whom the lawyers for Reserve intended to call to the stand was furnished on September 28th. It contained the names and affiliations of sixty-four men, who were listed according to ten different categories of information about which they could be expected to testify. Some of the names were familiar. They included Dr. Cralley and Robert G. Keenan, of Clayton & Associates; Dr. Paul Gross; Dr. Stephen Holmes, now chief health physicist for the Turner Brothers Asbestos Company; and Dr. John Corbett McDonald, of McGill University—all of whom had figured in the riddle about the medical-industrial complex. Also listed were Dr. Donald W. Meals and three other members of Arthur D. Little, including Dr. Charles J. Kensler, the firm's senior vice-president in charge of operations; Dr. Leonard G. Bristol, director of Immunobiological Research Laboratories of the Trudeau Institute, Inc., at Saranac Lake, which Johns-Manville has helped support for many years; and Dr. Hans Weill, professor of medicine in the pulmonary-diseases section of the Tulane University School of Medicine, whose study of asbestosis in workers at a Johns-Manville cement-products plant at Marrero, Louisiana, had been financially supported by the Quebec Asbestos Mining Association, of which Johns-Manville is a leading member.

Whatever the outcome of the trial, all those involved in the Duluth affair, and especially the city's hundred thousand residents, are keeping their fingers crossed. On the face of it, the predicament would seem to be an incredibly absurd and hapless one for the people of any city in this country—the most highly developed and technologically expert nation of the world—to be in. The major steel companies are anxious about it, because many of them have mines and mills in the Mesabi Range, and the health of thousands of their workers may have been seriously jeopardized through exposure to asbestos dust. Most anxious of all, however, are ARMCO and Republic Steel, for, as co-owners of Reserve, they might, if worst comes to worst for the people of Duluth, be sued under Minnesota law. As it happens, one of the chief medical consultants for Republic Steel these days is none other than Dr. George W. Wright. Dr. Wright's value to Re-

public Stock in the Duluth affair may prove to be limited by the fact that while in the service of Johns-Manville—the world's largest producer of chrysotile asbestos—he testified at the Department of Labor's public hearings amosite, not chrysotile, was, in his opinion, responsible for the gross excessive incidence of mesothelioma in the study of insulation workers conducted by Dr. Selikoff and Dr. Hammond.

DURING the summer, while the situation in Duluth was making headlines across the country, the Department of Labor addressed itself to the business of setting permanent standards for exposure to the fourteen chemical carcinogens for which it had promulgated six-month temporary emergency standards on May 3rd. As in the case of the asbestos standard a year and a half before, the Secretary of Labor convened an advisory committee—the Standards Advisory Committee on Carcinogens—in order to avail himself of expert advice on the problem. The committee was made up of fifteen members drawn from government, labor, the independent medical and scientific community, and industry, and in August, it recommended to Secretary Brennan that the permanent standards include a strict permit system, so that no company could manufacture or use any of the fourteen carcinogens without first demonstrating its ability to handle the chemical in a manner that would avoid detectable exposure to any worker. This recommendation came about largely because of evidence presented to the advisory committee by Dr. Wagoner's Division of Field Studies and Clinical Investigations, which demonstrated that literally hundreds of factories across the land were manufacturing and using the chemicals with either grossly inadequate or, in some cases, no controls for the protection of workers.

In September, when the Department of Labor's Occupational Safety and Health Administration held public hearings on the proposed standards, in Washington D.C., the recommendation of the advisory committee was discounted by Leo Teplow, a special consultant for Organization Resources Counselors, Inc., a concern representing forty major corporations, many of which either manufacture or use one or more of the carcinogens involved. Testifying at the hearings on September 11th, Teplow declared that the recommendation merited very little attention, and added, "This is a subject

for consideration by people of far more generalized experience than those who were primarily toxicologists and hygienists that composed this committee."

On September 14th, Teplow's statements were contradicted by Dr. Key, of NIOSH, who on this occasion took a strong and forthright stand on the matter of occupational exposure to known carcinogens. "It is the firm conviction of NIOSH that no evidence exists to scientifically conclude that any one of the fourteen agents under consideration is not carcinogenic in man," Dr. Key testified. "I make this presentation as a concerned public-health official in the spirit of fostering a better understanding of occupational carcinogenesis . . . and also in the spirit of encouraging a prudent approach to standards setting, so that we can profit from those lessons learned from experience with beta-naphthylamine and bis-chloromethyl ether. Such lessons, although advancing the state of knowledge as far as experimental versus human carcinogenicity is concerned, were unfortunately done at the expense of the health of the American worker."

On the same day, Samuels, of the Industrial Union Department, attacked the tuning of the public hearings. "This hearing could have been held more than two years ago, when our department and affiliates first questioned the exclusion of known carcinogens from the interim standards promulgated under the Occupational Safety and Health Act," Samuels testified. "The consequence is that, as a result of two years of unjustifiable exposure to carcinogenic agents, regardless of anything done now, hundreds and perhaps thousands of men and women can be expected to experience agonizing death from cancer in the next two decades. Sir, in a truly civilized society we would hold personally responsible those who participated in this crime, both the callous political creatures and the cancer peddlers who bartered moral and statutory obligations. In a just society they would now be undergoing rehabilitation in a penal institution. Instead, they walk freely—some of them are or have been in this room—as if evil is its own reward."

Although Secretary Brennan and Assistant Secretary Stender were required by law to announce the promulgation of permanent standards for the fourteen carcinogens by November 3rd, that deadline passed with no action taken. However, on November 8th, Gerard F. Scannell, the director of the Occupational Safety and Health Administration's Office of Standards, in-

formed Samuels that the new standards would not include a permit system, which had been recommended by Secretary Brennan's advisory committee, by NIOSH, and by the unions, so that the standards could be effectively enforced under the 1970 Act. If this proves to be the case, then once again, as in the case of the asbestos standard, a Secretary of Labor will have disowned the recommendations of the members of his own advisory committee and of occupational-health experts from NIOSH. (In this instance, he will even have disowned the advice of the staff of the President's Council on Environmental Quality, who have also strongly urged the necessity of including a permit system in the new standards.) Indeed, continuing the long business-as-usual approach of the federal government toward the crucial problem of industrial disease, he will have set standards for known cancer-producing substances which fail to adequately protect the health and lives of workers.

MEANWHILE, there were some new developments concerning Pittsburgh Corning's Tyler plant, which had provided the starting point for my twenty-one-month investigation of the medical-industrial complex. In October, I received a copy of a report entitled "Tyler Asbestos Workers Study"—a project designed to conduct a medical followup of the Tyler workers in the coming years—which had been drawn up by a newly formed, nonprofit organization called the Texas Chest Foundation, with headquarters at the Texas State Department of Health's East Texas Chest Hospital, in Tyler. The idea for the project had been initiated by Dr. Johnson late in the summer of 1972, and it had been developed since then by him and by Dr. Wagoner; by Richard A. Lemen, an epidemiologist in the Division of Field Studies and Clinical Investigations; by Dr. George A. Hurst, the superintendent of the East Texas Chest Hospital; and by Dr. Selikoff. Upon making inquiries, I learned that these men had met in May and June of this year with Dr. Michael B. Sporn, the chief of the lung-cancer branch of the Department of Health, Education, and Welfare's National Cancer Institute, for the purpose of engendering interest in and funding for the project. I also learned that during the late spring and summer, Lemen had managed to trace the whereabouts of six hundred and ninety-two of the eight hundred and ninety-five men who

had been employed at the Tyler plant from November of 1954, when it opened, until February of 1972, when Pittsburgh Corning shut it down. In addition, I found out that on June 18th, Dr. Johnson had written Dr. Grant, medical director of PPG Industries and medical consultant to Pittsburgh Corning—who had first ignored and then minimized the peril of the workers employed at the Tyler plant—informing him of the proposed study and of the National Cancer Institute's interest in it.

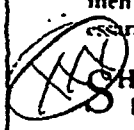
I talked with Lemen recently, and he told me that in August of this year he decided to revisit the site of the old Tyler plant, where the Imperial American Company now manufactures lawn furniture. "I had not been back to Tyler since January of 1972, when Steven Wodka and I visited the dumps where Pittsburgh Corning was disposing of asbestos waste," he told me. "Imagine my surprise when I discovered that the soil with which the company had later covered them over had eroded, and that loose wads of asbestos fibre were lying everywhere on the ground." Lemen went on to tell me that he had brought the matter to the attention of officials of the Texas State Department of Health and of the E.P.A. I later learned that Pittsburgh Corning had been directed by the E.P.A. this past September to remedy the situation. The company then proceeded to re-cover the dumps with two feet of soil and with four inches of topsoil, and to seed them with grass, at a total cost of some sixty thousand dollars. The prudence of the E.P.A.'s action was reinforced by an article that appeared recently in the *Annals of Occupational Hygiene*. The article was entitled "Asbestos in the Work Place and the Community;" it was written by Dr. Muriel L. Newhouse, of the London School of Hygiene and Tropical Medicine, who is well known for her studies of mesothelioma; and it included the description of "a patient suffering from a peritoneal mesothelioma [who] recalled playing with handfuls of asbestos on waste ground near a factory as a small boy, some forty years before he developed his tumour."

As for the "Tyler Asbestos Workers Study," which is being considered for funding by the National Cancer Institute (and to which, as yet, Pittsburgh Corning has not offered to make any contribution), it says, under the heading "Definition of the Problem":

In 1972, approximately eight hundred and seventy-five employees of a Tyler asbestos plant completed massive exposure

to inhaled amosite asbestos fibres. Approximately two hundred and sixty of these employees will develop cancer, mainly bronchogenic carcinoma, and die from this disease unless some type of successful intervention is undertaken.

At present, of course, no truly successful intervention to combat the development of lung cancer is known to the medical and scientific community, but it is at least a hopeful sign that if the National Cancer Institute funds the project the Tyler workers will not be wholly abandoned to the awful peril they have been exposed to (as have so many other asbestos workers in the United States), and that if in the next few years some kind of successful intervention is discovered some of these men who might otherwise die unnecessarily early deaths may be saved.

 SHORTLY before the Duluth story broke into the headlines, I received an announcement of the National Symposium on Occupational Safety and Health, which was to be held at the Carnegie Institution, in Washington, D.C., from June 4th to June 6th. Among the listed sponsors of the symposium were the Division of Industrial and Engineering Chemistry, the American Chemical Society, the Manufacturing Chemists Association, the National Safety Council's Chemical Section, NIOSH, and the Occupational Safety and Health Administration. According to the announcement, Session Six of the symposium, entitled "The Human Factor," would be co-chaired by Dr. Grant, who was scheduled to deliver some introductory remarks.

More recently, I received a copy of the October 3rd issue of *Chemical Week*, a publication put out by McGraw Hill. It contained an article entitled "Health Programs Need First Aid," which described a meeting of the Manufacturing Chemists Association, held in Atlanta during September. The article said that "O.S.H.A., now in its third year, had issued its first permanent health standards—for asbestos," and that "ten or more substances will have permanent standards by the end of the year, according to Lee Grant, medical director of PPG Industries, who moderated the discussion." The article went on to state that "Grant says O.S.H.A. will define a 'healthful environment' and take other steps concerning methods and sampling procedures in the work environment, medical examinations for employees, and prescribed work practices."

 Although I was unable to attend either the National Symposium on Occupational Safety and Health or the

Manufacturing Chemists Association meeting, I had had a chance to see Dr. Grant preside over a similar gathering almost a year before. The occasion was the One Hundredth Annual Meeting of the American Public Health Association, which was held in Atlantic City from November 12th through November 16th of 1972. At that time, nearly eight months had passed since James M. Bierer, the president of Pittsburgh Corning, telephoned me to say that he could not give me permission to talk with Dr. Grant, or with any other Pittsburgh Corning employee, about the Tyler plant. During those eight months, I had gathered a good deal of information about Dr. Grant, and it had made me all the more curious to meet him. Therefore, when I received a copy of the official program of the American Public Health Association's meeting and saw that he was scheduled to preside at two of its sessions, I decided to attend, in the hope of talking with him. I arrived in Atlantic City on Sunday, November 12th, and went directly to a meeting of the American College of Preventive Medicine, which was being held in Ballrooms A and B of the Holiday Inn and was being presided over by Dr. Grant in his capacity as the college's outgoing president.

Upon reaching the doorway of the ballroom, I could see half a dozen people sitting on a platform at the front of the room, about twenty yards away. I asked a young man standing in the doorway if he knew which of them was Dr. Grant, and he pointed out the man sitting at far stage right—a lean blond man, with deep-set eyes and a prominent nose, who looked to be in his middle forties. However, when the session ended, a few minutes later, and I advanced across the ballroom floor toward the platform, I realized that Dr. Grant was at least ten years older than I had thought, and that it was his blond hair—parted and combed in the flat collegiate style of twenty years ago—that made him appear younger at a distance. When I reached the platform, I introduced myself to Dr. Grant, who was standing above me, at approximately knee-to-eyeball level, and reminded him that I had telephoned him in March in the hope of being able to talk with him about the Tyler plant. I also reminded him that at the time he had referred me to Bierer, who had subsequently refused to give me permission to talk with any employee of the company.

"I wonder if there might be some time in the near future or two that I could talk with you," I said.

Dr. Grant appeared to hesitate. Then, glancing quickly over the ballroom, which was emptying, he shook his head. "I'm afraid I can't," he replied. "In this instance, it's a question of the patient's rights."

For a moment, I thought I had not heard him correctly. Then it dawned on me that he was talking about the company. "Do you mean Pittsburgh Corning?" I said.

"Why, yes," Dr. Grant replied. "If they don't want me to talk with you, there's nothing I can do."

"But isn't the patient all those men who worked in the Tyler plant?" I asked.

Dr. Grant straightened up and looked down at me from his full height on the platform. "Well, in the larger sense, of course, that's probably true," he replied. "And now, if you'll excuse me, I have some business to attend to."

I stood at the platform and watched Dr. Grant, who, as he moved away, put a cigar in his mouth, lit it, and exhaled a cloud of smoke into the air. A moment later, I saw him throw an arm in greeting around the shoulders of a colleague. Then I turned away, and found myself looking straight into the face of Anthony Mazzocchi, who, as it turned out, had been invited to speak at one of the convention's sessions on occupational health.

"Did you hear that?" I asked him. "Did you hear what he said?"

For a long time, Mazzocchi looked at me without a trace of expression on his face. Then, very slowly, he nodded his head up and down. And then, just as slowly, he shook it from side to side.

—PAUL BRODEUR

*(This is the last of a series
of articles.)*