

FILE NAME: Metropolitan Life (ML)

DATE: 1952

DOC#: ML255

DOCUMENT DESCRIPTION: Documents of Met Life Intimidation of Dr. Abrams Over Diatomaceous Earth at J-M CA

METROPOLITAN LIFE INSURANCE COMPANY

HENRY E. NORTH
VICE-PRESIDENT

HEALTH AND WELFARE DIVISION
WILLIAM P. SHEPARD, M.D.
THIRD VICE-PRESIDENT

PACIFIC COAST HEAD OFFICE
600 STOCKTON STREET
SAN FRANCISCO 20, CALIFORNIA

February 7, 1952

A.J. Lanza, M.D., Chairman
Institute of Industrial Medicine
New York University-Bellevue Medical Center
477 First Avenue
New York 16, N.Y.

*Met/Lanza
intimidation of Dr.
H. Abrams over
diatomaceous earth
hazards at J-M's
California plant - 1952*

Dear Tony:

Unfortunately, we shall have to do without Halverson's skilled guidance until after the February 26th meeting. However, Malcolm Merrill is still Acting Director and he is not only able but perhaps even more discerning than Hal in a situation of this kind. I am going over to see him this afternoon to be sure he is fully aware of the nuances of the situation so that he can keep Abrams in line.

I appreciate your two letters of February 5. Fortunately, I have one from Carey McCord on the overt "crimes" being committed by official state health departments, such as Abrams trying to swallow up the whole industrial hygiene field. Without quoting anybody, I will make sure that Merrill is aware of these matters.

Abrams just telephoned to say that if the industry insists, he would be willing to do the survey jointly with the Industrial Hygiene Institute. I ran across him at lunch at Stanford yesterday and subtly put a bug in his ear that he might not be able to get the full and willing cooperation of the industry on his own. He blustered a bit and maintained that it was his legal prerogative, but apparently after thinking it over and talking with Merrill, he changed his mind.

I feel rather strongly, after thinking it over, that you will have to have Anderson and Smart at the February 26th meeting. Tellefsen of Great Lakes Carbon is likely to invite them both, if you don't, since they also use their services. Abrams has a very cordial letter from Mr. Westmont saying that they will be represented at the meeting.

By the time I get back from next week's trip to Washington, I will have for you a complete agenda of the proposed meeting and a complete list of just what Abrams proposes to do in his survey. I will be at your complete disposal on the 25th. Let us know if you need hotel reservations.

Strangely enough, the second and even more damaging article prepared by Goe of the "Search" magazine and Nate Hale of the Chronicle, has not yet appeared in the Chronicle. They may be doing it for some national magazine.

Best regards.

Sincerely yours,

Bill

W.P. Shepard, M.D.
Third Vice-President

May 15, 1951

A. J. Lanza, M. D.
477 First Avenue
New York 16, N. Y.

Dear Tony:

Enclosed is a J-M check for the full amount of your bill of April 17, \$1262.00, covering your fee and hotel expenses on the trip that you made to the West Coast during the last week in March.

In addition, there was a charge of \$345.00 for the plane reservations which we bought for you in advance of the trip; making total expenses of \$1607.00.

Great Lakes Carbon Corporation agreed to share one-third of this expense to our two-thirds, and on this basis Mr. Tellefsen recently sent us their check for \$535.00, as you will note from the attached copy of his letter of May 11. We are retaining their check and settling the account with you in full.

Best wishes.

Sincerely yours,

J. P. Woodard

cc: Donald R. Tellefsen, Ass't Sec'y
Great Lakes Carbon Corporation
18 East 48th Street
New York 17, N. Y.



FORM 2-5A
PRINTED IN U.S.A.REQUEST FOR CASH ☐ CHECK ☒LOCATION CHQ
DATE 5-15-51
CHECK No.PAY TO A. J. Lanza, M. D.
477 First Ave.
New York 16, N. Y.

00012104

IN PAYMENT FOR

AMOUNT

professional advisory services of A. J. Lanza, M. D., in connection with investigation of aluminum inhalation program at Longport, 6 full days, March 26 to March 31, 1951, inclusive, plus hotel expenses, as itemized on attached bill dated April 17, 1951

\$1262.00

NOTE: Great Lakes Carbon Corporation's check No. 30533, to J-M, dated 5-11-51 and amounting to \$535.00, represents their agreed-upon share of Dr. Lanza's expenses.

CONFIDENTIAL EXPLANATION, IF ANY—NOT TO BE SHOWN IN VOUCHER SPACE OF CHECK

TOTAL \$1262.00

VOUCHER NO.	RESPONSIBILITY	ACCOUNT NUMBER	CONTRACT OR REBATE INVOICE NO.	AMOUNTS	CORRECT	APPROVED
	5509 -	88.34		\$1262.00		
					CASHIER	

RECEIVED
CASH PAYMENT.*Checks are always sent to payee.**If this check is not to be sent to payee give name and address and state reason.*

Send to J.P. Woodard, 7th floor,
to be enclosed with letter of
transmittal.

Some Hidden History of Occupational Medicine

HERBERT K. ABRAMS

Department of Family and Community Medicine, University of Arizona, Tucson, Arizona 85724

Received May 15, 1992

INTRODUCTION

Irving J. Selikoff's research and publications on asbestos-related disease constitute a landmark in recent medical history. Many investigators contributed to the asbestos story, starting at the turn of the century, and the salient features of asbestos diseases were in the literature by the 1940s. But it remained for Selikoff's work, some of it done in collaboration with the trade unions representing the affected workers—a sponsorship not common in occupational medicine—and its prompt and effective publication, to stimulate widespread public interest and the consequent lawsuits which contributed in part to the control of these diseases. Some of the people, and one of the insurance companies involved in the episodes described, made constructive contributions to occupational health in the early part of the century. A. J. Lanza, for example, conducted studies on asbestosis and silicosis and their relationship to tuberculosis among hard rock miners. In 1949, he became director of the Institute of Industrial Medicine at New York University. Louis Dublin, statistician for the Metropolitan Life Insurance Company, contributed substantially to the understanding of silicosis and tuberculosis and the impact of work conditions on health. These facts make the following story all the more poignant.

Both asbestos and diatomaceous earth diseases¹ came to industry's attention in the late 1920s and early 1930s. In the Johns-Manville facilities in Canada and the United States, and in the Raybestos-Manhattan textile manufacturing plants and in other asbestos fabrication industries, damage claims for asbestosis had been increasing. During the same period a study in Lompoc, California, at the Johns-Manville plant, the largest producer of diatomaceous earth (diatomite, or DE) uncovered an epidemic of silicosis and silico-tuberculosis (Legge and Rosenkrantz, 1932). Labor complaints (L'Amiantose, 1950) as well as lawsuits combined to alert the industries to the problems.

So serious were these problems that several of the companies were impelled to subsidize scientific investigations. Johns-Manville, Raybestos-Manhattan, and several other companies joined together to sponsor research on asbestos, and Johns-Manville supported studies on diatomite. In both instances, they called on the Trudeau Foundation Laboratory at Saranac Lake, New York, headed by Dr. Leroy U. Gardner.

¹ Any statements regarding the diatomaceous earth story which are not referenced are documented in the files of the Bureau of Adult Health, California State Department of Health, copies of which are held by the author.

ASBESTOS

Although asbestos had been recognized as a health hazard since the turn of the century, the lung disease had been named asbestosis in 1927 by the English physician W. E. Cooke, and silicosis had been known since antiquity, industry in both cases (i.e., asbestos and diatomite) continued to resist their recognition as compensable occupational diseases long after their own sponsored studies confirmed these diseases both in animal experiments and in human studies.

In 1929, Johns-Manville requested the Metropolitan Life Insurance Company (Metlife) to study the asbestos problem and Dr. Anthony J. Lanza, then assistant medical director of Metlife, was assigned the job (Lanza, 1935).

What followed was a curious pattern of confirmation of these diseases as work-connected, and "editing" of the findings of their own paid investigators. Dr. Lanza, the principal medical authority for these companies, was aided by the willingness of various scientists to accommodate their findings in favor of industry.

While the direct economic stake of the asbestos and diatomaceous earth industries was obvious, it was at first not clear why Metlife and its leading doctors, Lanza and W. P. Shepard, were so deeply involved in managing the disposition of the research findings and in the interpretation of these health hazards to the industry, the workers, the medical profession, and the general public.

Metropolitan Life for some time had carried group life insurance for the employees of Johns-Manville and the company also had been granting funds to the Saranac Laboratories. However, it was not until the exposé of the diatomaceous earth situation in early 1952 that it was revealed that Metropolitan Life was also a substantial investor in the Johns-Manville Corporation (Moody, 1951). Diatomite had been used by Nobel to make dynamite at the end of the 19th century. Ironically, it proved to be the spark that set off a chain of events leading to the exposé of some questionable behavior on the part of certain corporations.

Much of the evidence for the above did not come to light until lawsuits resulted in the revelation of hitherto confidential records. Let us consider a sample of the evidence in chronological sequence.

From October 1929 to January 1931, the Metropolitan Life Insurance Company Industrial Health Service, under Dr. A. J. Lanza, studied asbestos dust conditions and workers in several plants in the United States. Although completed in January 1931, the study was not published until 4 years later in 1935 (Lanza, 1935). During the interim the Johns-Manville and Raybestos-Manhattan people had the opportunity to persuade Lanza to insert phraseology favorable to the industry. For example, George S. Hobart, an attorney for Johns-Manville, wrote on December 15, 1934, to Vandiver Brown, the top attorney of Johns-Manville, that he did not want Lanza's report to suggest that asbestosis might be assumed to be "similar to silicosis." Brown sent on December 21, 1934, Hobart's editorial suggestions to Lanza with the following comment:

I am sure that you understand fully that no one in our organization is suggesting for a moment that you alter by one jot or tittle any scientific facts or inevitable conclusions revealed or justified by your preliminary survey . . . all we ask is that all of the favorable aspects of the

survey be included and that none of the unfavorable be unintentionally pictured in darker tones than the circumstances justify. I feel confident we can depend upon you . . . to give us this 'break' and mine and Mr. Hobart's suggestions are presented in this spirit.

Dr. Lanza was obliging, for his conclusions emphasized that ". . . asbestos dust caused a pulmonary fibrosis . . . different from silicosis . . . and of a type milder than silicosis" (Brodeur, 1985). (Some years later, Dr. Hutchinson, a British physician, reported what many already had observed, that "asbestos is the most vicious of the pneumoconioses" (Hutchinson, 1965).)

Despite Lanza's care to report as favorably as possible, he reported, of 121 men currently working, 64 or 53% had definite asbestosis and all but 8 had symptoms of dyspnea and cough. Although the willingness to alter his report was significant, the delay of 4 years in publishing his findings added to the unconscionable delay of almost half a century in the general recognition and control of asbestos as a major health hazard.

In 1936 several major asbestos companies contracted with Dr. Leroy U. Gardner of the Saranac Laboratory to conduct studies on asbestos. In his letter of November 10, 1936, to M. F. H. Schluter of Thermoid Rubber, Sumner Simpson, President of Raybestos-Manhattan, writes of a conference with Vandiver Brown, attorney for Johns-Manville, Dr. Gardner, and Drs. Lanza and McConnell of Metropolitan Life. They offer to pay Gardner \$5000 per year for a 3-year period. Simpson writes, "the idea of Mr. Brown and myself would be to have four or five . . . asbestos manufacturers take over this study . . . and then we could determine from time to time after the findings are made, whether we wish any publication or not. My own idea is that it would be a good thing to distribute the information among the medical fraternity providing it is of the right type and would not injure our companies" (Metlife, 1991).

On November 23, 1936, Dr. Gardner writes to Mr. Brown of Johns-Manville agreeing with the proposal "to proceed with the proposed asbestos experiments" . . . for a sum of \$5000 annually for a period of three years. "The Saranac Laboratory agrees that the results of these studies shall become the property of the contributors and that the manuscripts of any reports shall be submitted for approval of the contributors before publication" (Metlife, 1991).

On March 23, 1939, the editor of the trade paper *Asbestos* writes to Simpson ". . . of course we understand that all this information on asbestos is to be kept confidential and that nothing should be published about asbestos in *Asbestos* at present" (Metlife, 1991).

On May 4, 1939, Simpson writes to Brown his concern that Gardner is ". . . giving some results of the experiments with the asbestos dust to various professional organizations. He (Gardner) is certainly not living up to his agreement of November 1936. The reports may be so favorable to us that they would cause us no trouble, but they might be just the opposite, which could be very embarrassing." And, on May 10, 1940, Brown writes to Simpson about the same concern (Metlife, 1991).

On October 24, 1946, Gardner suddenly died, leaving unpublished manuscripts on his asbestos studies. At this point, Dr. Lanza, then Associate Medical Director for Metropolitan Life, took over the handling of Gardner's findings. In the manu-

script "Asbestosis, Reports of Studies by the Saranac Laboratory to the Johns-Manville Corporation," dated September 30, 1948, there is a section entitled "Neoplasm" in which appears the statement "... certain observations on this subject were recorded in the outline of the proposed manuscript on Asbestosis submitted by the late Dr. L. U. Gardner in February 1943. In it he called attention to the high incidence of lung cancer among mice inhaling long-fiber asbestos. . . ." This section has been marked with a large scrawl "OUT" (Metlife, 1991).

In the "Outline of Proposed Monograph on Asbestosis-Saranac Laboratory Study Under Grant From Asbestos Association, 1943," Gardner notes under "Part I Human Asbestosis" the caption "Complication of Asbestosis, Cancer of the Lung." Here, Gardner refers to 23 human autopsies and makes this comment on cancer of the lung: "... there are now on record 10 cases of lung cancer in asbestos workers. Compared to the total number of autopsies on asbestosis, this incidence is excessive. . . . The evidence is suggestive, but not conclusive that asbestosis may precipitate the development of cancer in susceptible individuals."

With respect to his animal experiments, Gardner summarizes, "Thus the incidence of lung cancer in the long-fiber asbestos mice was over 16 times the average for mice inhaling other dusts for comparable periods. . . ."

In addition, the Gardner outline has a "Recommendation for a new standard of safe atmospheric concentration of asbestos dust" in which he states, "While there is no official standard, the tentative one of four or five mppcf of air is frequently quoted. . . . This is probably unreliable" (Gardner, 1943). This statement is particularly significant in light of the many arguments over the standard which occurred in later years.

Lanza sent these manuscripts to Dr. Kenneth Lynch of South Carolina with the request that Lynch edit the documents for publication. Lynch was then Dean of the Medical College of South Carolina and was also an authority on asbestosis, having published the first U.S. report on a case of lung cancer with asbestosis in 1935 (Lynch, 1935). Lynch reviewed the material and recommended that it be published as is. Lynch wrote Lanza on June 30, 1947, "... the partially completed manuscript which Gardner left could properly be published as a final report upon the experimental program which . . . had been completed." Lynch said the manuscript "... is worthy as it stands." Lynch repeated his advice to Lanza in a letter, August 7, 1947: "I still believe Gardner's material is publishable as it stands . . ." (Metlife, 1991).

When A. J. Vorwald succeeded Gardner as head of the Saranac Laboratory, he then took up the matter of editing with Lynch. Lynch repeated his recommendation that the material be published as written; however, Vorwald, apparently with Lanza's concurrence (or possibly his direction, since Lanza is copied in all this correspondence), insisted that the material had to be edited before publication.

On October 12, 1948, Thomas Durkan, Assistant Director of Saranac, sent J. P. Woodard of Johns-Manville "copies of our experimental studies with asbestos. . . . The report is . . . fairly complete . . . with the exception of a minor section devoted to lung cancer. . . ."

Vandiver Brown, General Attorney of Johns-Manville, is quite explicit in his

memo of October 22, 1948, saying, “. . . I suggest eliminating reference to tumors and also to pneumonia” (Gardner had also reported excessive incidence of pneumonia in his experimental animals).

On October 27, 1948, Brown transmitted Gardner's report to eight companies, American Brake Block, Gatke, Keasby and Mattison, Raybestos-Manhattan, Russel Manufacturing, Thermoid, Union Asbestos, and U.S. Gypsum, “with the request that you treat it with the utmost confidence. . . . It is obviously undesirable that the report in its present form receive any distribution or publicity outside a limited number of people in our respective organizations” (Metlife, 1991).

And, on November 30, 1948, J. P. Woodward of Johns-Manville in his letter to Thomas L. Gatke, President of the Gatke Corporation writes, “. . . I have discussed with Dr. Lanza his taking up with Saranac the matter of revising the report and putting it in the shape we agreed upon. Dr. Lanza has agreed to do this for us.”

Lanza, on December 14, 1948, writes these instructions to Vorwald “. . . It was the feeling of the group (the underwriting companies—HKA) that all references to cancer or tumors should be omitted. . . .” And to make the report even more favorable, Lanza says, “The group felt that there might be included under *Conclusions* a reference to the *non-progressive* character of the fibrosis. . . .” Further, instructs Lanza, “Where experimental results indicate that asbestos fibre produces a different action than that caused by free silica, emphasize these points. . . .” As a final order to Vorwald, Lanza says, “Any report on human asbestosis should be separate and not a part of this report.”

The report entitled “Experimental Studies of Asbestosis” by Vorwald, Durkan, and Pratt was finally published in the *AMA Archives of Industrial Hygiene and Occupational Medicine*, January 1951 (Vorwald, 1951). This was 15 years after Gardner agreed to do the studies and 5 years after his death when he left the manuscripts which Dr. Lynch had said should be published without change. It reflected faithfully the changes dictated by the industry via Dr. Lanza. How many lives would have been saved if Gardner's observations including those on lung cancer and asbestos had been reported without censorship?

DIATOMACEOUS EARTH

Evidently Dr. Vorwald rankled over his experience in having to alter the Gardner findings at the behest of industry, as evidenced by the following exchange in 1948 between him and J. P. Woodard, Executive of Johns-Manville, concerning the diatomaceous earth studies. On December 22, 1948, Woodard wrote to Vorwald, with a copy to Lanza

. . . we assume that the results of the studies will be considered the property of Johns-Manville who is advancing the funds, and that we will determine whether, to what extent and in what manner the results should be made public, and that nothing will be published that does not have our approval as a contributor. This is in keeping with the arrangement made in the case of the asbestos study and is, I understand, usual, and for the protection of both Saranac and ourselves.

To which Vorwald replied in January 1949,² "It is unwise for us to jeopardize our research position which we would do should we acquiesce in having no responsibility for publication of our findings. Medical research is not conducted on that basis. Rather, it must remain free and in a position to serve in the best interest of human welfare. . . ."

Despite this principled stand by Vorwald, it was to be several more years before the Johns-Manville experience with diatomaceous earth was to see the light of day in an American publication, and some two decades late if the science and industry people had handled it responsibly. Following are some of the main events in this episode.

The Johns-Manville Corporation acquired the diatomaceous earth (diatomite) mines and mills in California in 1928. They occupy a huge area near Lompoc, Santa Barbara County, and constitute the largest diatomite industry in the world. Diatomite is almost pure silicon dioxide (SiO_2), usually termed "free silica," which is the cause of silicosis.

The earliest contact of public authorities in California with this industry occurred in 1930 when Drs. R. T. Legge and Esther Rosencrantz, both from the University of California College of Medicine, made a medical study of 118 laborers at the plant. They did the investigation under the auspices of the Bureau of Tuberculosis of the California State Department of Public Health in response to reports of a high rate of pulmonary tuberculosis in this area. In summary, of 118 men given physical examinations and chest X rays, 81 or 68.5% were found to have silicosis. This study was published in the *American Journal of Public Health* (Legge and Rosencrantz, 1932).

For 20 years following this event, nothing further appeared in the American medical literature. During this period, several reports of silicosis in this industry appeared in European journals (Podwyssozki, 1910; Nordman, 1943; Duvoir and Durobert, 1947; Vigliani and Mottura, 1948). Yet there was silence from the world's largest producer and its eminent medical consultants (Abrams, 1954).

The first recorded contact of the newly established Bureau of Adult (Industrial) Health of the California State Department of Public Health occurred in October 1940 when Dr. J. P. Russell visited the Lompoc plant and, according to his statement, was "unable to obtain access to physical examination or x-ray records or to inspect the Lompoc quarries and mill because of the company's blanket requirement that permission to enter the plant must first be obtained from the head offices in New York City."

Dr. Russell wrote this to Dr. Elmer Bingham, the health officer of San Luis Obispo, in response to an inquiry from Bingham about a patient with silicosis who gave a history of having worked at the Lompoc plant. In addition, Russell stated "both Mr. Westmont (plant superintendent) and Dr. Truax (plant physician) informed me that to the best of their knowledge, no one employed in this plant has ever developed silicosis."

Occasional contact by the California Bureau of Adult Health with Johns-Manville in Lompoc began again in 1944. None of these involved medical studies

² The exact date was illegible.

but, in February 1957, dust studies were done. At that time the maximum allowable concentration (MAC) was 5 mppcf. On this study of 16 areas sampled, 4 were within the "safe" limit. The other areas showed counts between 5 and 270 mppcf.

In August 1947, a combined medical-engineering study of the industry was proposed to be done by the Bureau of Adult Health with the California Division of Industrial Safety and the U.S. Bureau of Mines. This was never done because according to certain members of the Bureau staff based upon a statement by Dr. A. J. Lanza, then Associate Medical Director of Metropolitan Life Insurance Company, the company had the problem under control, and Dr. Reginald Smart, a medical consultant to the company, and Dr. W. M. Anderson, the plant physician, would soon publish the medical data they had been accumulating for some years (Abrams, 1954).

I became Chief of the Bureau of Adult Health in the summer of 1947. Following this, until my departure in the summer of 1952, I visited with Drs. Smart and Anderson many times and met with Dr. Lanza several times and they repeatedly assured me that they had the problems under control; that Dr. Leroy Gardner, who had died in 1946 and had been head of the Saranac Laboratory in New York, had been investigating the problem under subsidy from the company since 1936; that they (Anderson and Smart) had furnished Gardner with 22 lung specimens taken by autopsy or surgery from Johns-Manville workers; and that they had a file of many more cases.

At the very same time, company representatives and Dr. Lanza were telling me that essentially no problem existed. At a meeting I attended in 1947 at the Mark Hopkins Hotel in San Francisco on the occasion of a visit by Dr. Lanza, a Johns-Manville management representative stated flatly that no workmen's compensation award for diatomaceous earth pneumoconiosis had ever been made by his company.

Several months later after the public exposé of conditions at the Johns-Manville plant in Lompoc, I found in the California Industrial Accident Commission files 32 workmen's compensation claims against the industry, filed between 1932 and 1950, almost all against Johns-Manville, a few against Great Lakes Carbon Company. Of this number, 7 had been given awards and 10 had been settled by "compromise and release." The remainder were in various stages of litigation or inaction (Abrams, 1954).

In 1948, Dr. William H. Carnes, a pathologist at Stanford University who had worked on diatomaceous earth cases as a consultant to the industry, gave me carbon copies of two papers prepared for presentation at the AMA Convention in June of 1948. One was entitled "Diatomaceous Earth Pneumoconiosis" by W. H. Carnes, W. Anderson, and R. Smart (1948). The other was "Diatomite Pneumoconiosis Pathologic Aspects" by Carnes (1948). They are scholarly papers describing the disease in detail including discussion of 10 lung specimens sent to the Saranac Laboratory for examination by Gardner and, later, Vorwald, after Gardner's death in 1946. These papers were actually listed in the AMA program of that year and abstracts were printed. But the papers were never published. In 1950, Dr. Carnes gave me a copy of a letter from Professor Philip Drinker of Harvard, who was then the editor of the *Journal of Industrial Hygiene and Occupational*

Medicine, requesting publication of the manuscript by Carnes, Anderson, and Smart. Smart wrote a curt letter of refusal. Carnes, in 1952, after the exposé had broken, told Nathan Hale, reporter for the San Francisco Chronicle, that publication of the papers had been suppressed by the company.

At a meeting in about 1950, in San Francisco with Dr. Lanza and others, we discussed diatomaceous earth. At one point I referred to the condition it causes as *silicosis*. Dr. Lanza became angry, pounded the table and corrected me, "It is not *silicosis*, it is diatomaceous earth *pneumoconiosis*!" (Abrams, 1990).

In September 1951, I had a visit from Robert Goe, assistant editor of *Search* magazine. *Search* was the monthly publication of the California Tuberculosis and Health Association, the Christmas Seal organization, and the leading voluntary health organization in the state. Goe was interested in writing features about occupational health problems of the lung. My staff and I described many problems in California: silicosis in hard rock miners, asbestosis, and others. He had never before heard of diatomaceous earth and this aroused his interest. We suggested he might visit the Johns-Manville plant in Lompoc and the Great Lakes Carbon Company plant in Southern California. He left our office with the idea of writing a feature about how interesting is the diatom, the one-celled water creature whose skeletal remains make up diatomaceous earth, and about what good work the industry is doing in protecting their workers.

Two weeks later Goe phoned me to say he had been to Lompoc and Santa Barbara. At Johns-Manville he was denied access to the plant and told there was no problem. Dr. Busby, Director of Tuberculosis Control for the Santa Barbara Health Department, refused to talk about it in his office.

Dr. Caldwell at the Santa Barbara Tuberculosis Sanitorium told him there were five cases of silico-tuberculosis in the sanitorium at that time. A local attorney showed him records of eight claims in which the company had made a settlement. Goe wrote a rather interesting and innocuous article about the diatom and diatomaceous earth and quoted mainly from Italian scientists who had published about the disease in European journals.

Upon returning to San Francisco, he called Dr. William Shepard, Vice President of Metropolitan Life Insurance Company and Medical Director for the company in the West. Shepard was on the Board of Editors of *Search* and was a prominent physician in occupational medicine and Goe had heard that Metropolitan Life Insurance Company had once studied the problem. Over the telephone Goe read the draft of his article for *Search* which he wished to publish in the November 1951 issue. Shepard advised him not to publish it as "it is an unimportant problem . . . there are few people involved . . . why not write about lead poisoning in the storage battery industry?" A few days later during the time of the APHA Convention in San Francisco, Shepard contacted Goe with the admonition, "You're not going to publish that, are you?"

On November 4, 1951, a meeting was held at the offices of the California State Health Department in San Francisco to discuss the article which Goe had written. Attending were Charles E. Smith, Dean, University of California, School of Public Health, Berkeley; Drs. Robert Dyar and Frederic Kriete of the State Health Department; Byron Hubbard, Industrial Hygienist of the Bureau of Adult Health;

and Dr. Abrams, Chief of the Bureau. We all read the article. All agreed it was innocuous and all wondered why Dr. Shepard, who had no obvious connection with Johns-Manville was so concerned that it not be published.

Because of his experience in Lompoc and, added to this, the effort of Shepard to persuade him not to publish the article, Goe and his editor, Mary White, became intrigued with the subject. They put aside the first article and investigated further. They probed into the California Industrial Accident Commission (IAC) worker's compensation files in the state building in Los Angeles and dug up evidence of 102 cases of diatomaceous earth pneumoconiosis since the early 1930s; they were impressed with evidence of company suppression of information about the disease and of company efforts to avoid paying compensation.

The result was the article which Goe published in the January 1952 issue of *Search* magazine entitled, "Death by Dust, Pneumoconiosis from Diatomaceous Earth" (Goe, 1952).

On the day the *Search* article appeared, Dr. Shepard telephoned me. His voice was angry and excited and he accused *Search* of "yellow journalism." He spoke of writing a letter of protest and of firing Mr. Kirk, the Executive Director of the California Tuberculosis and Health Association. He stated that the California Tuberculosis and Health Association had no business concerning itself with such subjects and should confine itself to tuberculosis. (Note Shepard's previous suggestion to Goe that he write about lead poisoning.) Goe later phoned me to say that he learned that Shepard had called the Association and that he and White expected to be fired.

Following the *Search* article, the San Francisco Chronicle, ("The Story of a Strange and Dangerous Dust"), Lompoc Record, and other newspapers published stories. The International Chemical Workers Union, the union at Johns-Manville Lompoc, went out on strike and made health protection a major issue. The East Bay Labor Journal, July 4, 1952, headlined its story, "Chemical Workers Face Death by Dust" and said, "The strike . . . now in its 15th week . . . is literally a strike for their lives" (Abrams, 1954).

In a conversation with Dr. Shepard shortly after the story broke, I mentioned to him that *Time* magazine had called me and was doing a story. Shepard asked me the name of the *Time* writer. I told him "Ed Rees." The *Time* article never appeared.

Nathan Hale, the San Francisco Chronicle reporter, went to Lompoc. Among other things, he learned: Dr. J. M. Bertero, former director of the Santa Maria Hospital, told him that between 1935 and 1950 there were eight deaths there from diatomaceous earth pneumoconiosis but they were not listed as pneumoconiosis because ". . . we didn't want to be bothered by lawyers."

George C. Lockard, Director of Lompoc's Community Hospital, told Hale, "We have never to my knowledge, had such a case. I had not even heard of the disease until the Chronicle's story on Sunday. Furthermore, if I had any information, I would not make it available to you for this reason today: I could not get my family out of town tomorrow."

In the aftermath of the exposé, I had recommended that the Bureau of Adult Health along with management do a thorough study of the problem. I suggested

this also to Shepard since he was officially a Bureau consultant. On February 6, 1952, Shepard told me the company would rather have the Industrial Hygiene Foundation (IHF) of Pittsburgh, Pennsylvania, do the study, as an "impartial agency." It should be noted that the IHF was 100% management supported. Dr. M. Merrill, then Deputy Director of the California State Health Department, objected to this.

The 32 workmen's compensation claims for DEP which I found in the IAC files are a fascinating source of information on how some of the companies fought the claims and how on the one hand company-employed physicians accommodated their professional integrity to the needs of the company but how some personal physicians fought heartbreaking battles to win compensation for their patients.

An example taken from the stenographic records of the Referee's Summary follows (in the case of M. Gonzales vs Great Lakes Carbon and Johns-Manville Company

Dr. Reginald Smart, for the defendants, testified he first saw the patient's chest x-ray in 1940 and made a diagnosis of diatomaceous earth pneumoconiosis with superimposed tuberculosis. Dr. Smart stated he had never told patient about his condition. "There was care used not to excite fear or hysteria of the men regarding any danger." Dr. Smart does not discuss condition of employees with them, unless authorized by the company who retains him. The patient was never told his chest disease was due to his work, nor was he advised to get out of dust. . . .³

At a hearing on September 25, 1950, Dr. Smart stated that in 1941 he told representatives of management that the applicant's pneumoconiosis was due to his work. On the basis of his testimony, the lawyer representing Pacific Employees Insurance Company raised a protest against the Dicalite Company* for fraudulent concealment of facts relative to this patient. He stated Dicalite knew of the applicant's condition in 1940, but did not report it to the insurance carrier until 1949. The lawyer representing the National Automobile and Casualty Insurance Company joined in the protest (CA IAC, 1949).

In another case, Dr. A. B. Steele of Santa Barbara, California, in the claim of his patient E. J. Williams, states in part,

These conclusions by Dr. Gardner (of Saranac) established the fact that silicosis . . . could not be acquired in the Johns-Manville plant. . . . From the beginning there has been something odd about these conclusions . . . as cases have multiplied . . . I came to regard these

³ Dr. Kenneth W. Smith, former medical director of Johns-Manville, had made a study of 708 men who then worked in the asbestos mills of Johns-Manville in Quebec, Canada, during 1948. All of the X rays except four showed signs of asbestosis. Smith made the following statement: "It must be remembered that although these men have the x-ray evidence of asbestosis, they are working today and definitely are not disabled . . . they have not been told of this diagnosis for it is felt that as long as the man feels well, is happy at home and at work, and his physical condition remains good, nothing should be said. When he becomes disabled and sick, then . . . the claim should be made . . . the fibrosis . . . is irreversible and permanent . . . Should the man be told of his condition today, there is a . . . possibility that he would become mentally and physically ill, simply through the knowledge that he has asbestosis (Brodeur, 1985, p. 102).

* Dicalite was a product of Great Lakes Carbon Co.

mistaken conclusions as the Gardner myth. . . . I have become more than ever convinced that silicosis can be acquired from the dust in the Johns-Manville plant at Lompoc. . . .

(Mr. Williams was given a compromise and release settlement of \$1000 (CA, IAC, 1944).)

The aggressive intervention of Shepard on behalf of the Johns-Manville Corporation was a source of puzzlement for us at the California State Health Department. Many local authorities came to the defense of the *Search* magazine article, among them Dr. Charles E. Smith, Dean of the University of California School of Public Health, and Dr. Harold G. Trimble, a prominent chest physician who was on the California Tuberculosis and Health Association Board.

On April 1, 1952, shortly after the exposé, Robert Goe called me on the phone to read the following item from Moody's "Manual of Investments, Industries, 1951" (Moody, 1951).

Term loan outstanding December 31, 1950, five million dollars at 2.7% interest payable 5% annually from July 16, 1952, balance July 16, 1967 issued under twenty-five million dollars credit from Metropolitan Life Insurance Company and Mutual Life Insurance Company of New York to the Johns-Manville Corporation. Remaining twenty million dollars available through December 31, 1951 for borrowing in units of not less than two and one-half million dollars, subject to commitment fee of not less than one-half of one percent of unused portion.

In 1953, after I had moved to Chicago and while I was preparing my paper on diatomaceous earth pneumoconiosis for presentation at the annual meeting of the American Public Health Association in New York City on November 10, I received a telephone call from a colleague working at the California State Health Department to say that Dr. Shepard requested me not to present the paper (Abrams, 1954).

Some time later, Harriet Hardy, one of our pioneers in occupational medicine, commented on the basis of similar experiences, ". . . Knowledge of such behavior by U.S. industry was a shock to me, who, although exposed to a variety of human weaknesses as a medical student and physician, had not realized the possible evils of the free enterprise system. I learned much at Saranac, confirmed by earlier and later experience with industry and insurance companies and especially with legal advisers" (Hardy, 1983).

ETHICS

Medical ethics has been a focus of concern since antiquity. The Oath of Hippocrates attributed to the "Father of Medicine" (460-370 BC), in some form, is sworn by medical students as they are given their diplomas. As Pellegrino (1987) points out, "The central and most admirable feature of the oath is the respect it inculcates for the patient. In the oath, the doctor is pledged always to help patients and keep them from harm." This central thought persists in the many modern modifications of the oath.

In recent years, certainly in the United States, medical, and more broadly, scientific, ethics have become a major concern to the professions and to the public, so much so that a new career has developed: the medical ethicist. The subject is presented with vigor, if not always with clarity, in the newspapers and

the television shows. Most of the issues which have been publicized revolve around the physician-patient relationship, such as confidentiality, life maintenance in terminal illnesses, and special problems resulting from AIDS. Possible bias in research because of conflict of interest has led some medical journals to request authors for financial disclosures which may indicate conflict of interest.

The stories detailed in this report illustrate the pressure from the sources of money to control the disposition of research discoveries, and the ability, in these instances, of industry to find physicians and other scientists amenable to this pressure. Occupational and environmental medicine probably experiences more of such pressures than do other specialties. Examples of other similar episodes are the osteogenic cancers in radium watch dial workers (Martland, 1929), coal workers pneumoconiosis (Smith, 1981), and beryllium disease (Hardy, 1965). Henrik Ibsen made the issue the central theme of his famous play "An Enemy of the People" (Ibsen, 1882).

The stories also point out another intriguing and growing issue in present-day society: the role of the law and the judicial process in medicine and in science. Although we in medicine are prone to be critical of lawyers and fearful of the entry of the judicial processes into the work of doctors—and in many cases this apprehension is justified—one needs to appreciate another aspect: many of the hitherto concealed facts about the knowledge of asbestos-related disease were uncovered on the initiative of lawyers. Similarly, in communities throughout the country, lawsuits are bringing to light individual and public health hazards that should have been researched and publicized by the scientists (Lilienfeld, 1991).

The relationships between medicine and the scientific professions, the people in our neighborhoods, the workers in our factories, and the public media are all interdependent. Technicians discover chemicals in our water supply; physicians diagnose diseases. Whether there is a connection or not depends on scientific investigation, but often the impetus for this scientific study remains to be generated by the concerns of individuals and communities of people, whether expressed in the media, in lawsuits, or in political action.

In all of this, questions are raised about the role of the physician, especially the physician or scientists employed or subsidized by industry. To whom does he owe his loyalty? Whose agent is he? What are his responsibilities to his individual patient and to the public health?

Two and one-half millenia ago, Hippocrates gave us the guideline *primum non nocere*, and by extension to the modern context, Pellegrino says, "Ethically responsive doctors will thus find themselves more and more at the intersection of social and individual ethical values, impelled to act responsibly in both spheres" (Pellegrino, 1987).

REFERENCES

- Abrams, H. K. (1954). Diatomaceous earth pneumoconiosis. *Am. J. Public Health* 44, 592-599.
- Abrams, H. K. (1990). Historical perspectives in occupational medicine—Diatomaceous earth silicosis. *Am. J. Ind. Med.* 18, 591-597.
- Brodeur, P. (1985). "Outrageous Misconduct, the Asbestos Industry on Trial," pp. 113-115. Pantheon, NY. [Correspondence Brown and Lanza; p. 102 re. Smith]

- California Industrial Accident Commission (1944). Claim SF85723, E. J. Williams vs Johns-Manville, *et al.*
- California Industrial Accident Commission (1949). Claim LA-107-170. Manuel Gonzales vs Great Lakes Carbon Corporation and Johns-Manville Products Corporation, *et al.*
- Carnes, W. H., Smart R., and Anderson R. (1948). "Diatomaceous Earth Pneumoconiosis," prepared for AMA convention, not published.
- Carnes, W. H. (1948). "Diatomite Pneumoconiosis. II. Pathologic Aspects," prepared for AMA convention, not published.
- Duvoy, M., and Derobert, L. (1947). La Pneumoconiose par terre de diatomées etude experimentale et clinique. *Ann. Med. Leg.* 27, 48-58.
- Gardner, L. (1943). Outline of proposed monograph on asbestosis, unpublished; copy obtained from Attorney R. Motley, Charleston, SC.
- Goe, R. (1952). Death by dust. *Search*, January, pp. 109-111.
- Hardy, H. L. (1965). Beryllium poisoning—Lessons in control of man-made disease. *N. Engl. J. Med.* 273, 1188-1199.
- Hardy, H. L. (1983). "Challenging Man-Made Disease," p. 46. Praeger, New York.
- Hutchinson, J. E. M., (1965). Introductory lecture, symposium on Asbestosis, *Newcastle Med. J.* 29(12), 12-16.
- Ibsen, H. K. (1882). *Enemy of the People*, in "6 Plays by Ibsen." Random, New York.
- L'Amiantose et Les Medecins, Le Travail, Montreal, 3 Aout, 1950.
- Lanza, A. J., *et al.* (1935). Effects of the inhalation of asbestos dust on the lungs of asbestos workers. *Public Health Reports* 50, 1.
- Legge, R. I., and Rosencrantz, E. (1932). Observations and studies on silicosis by diatomaceous silica. *Am. J. Public Health*, 22(10), 1055-1060.
- Lilienfeld, D. E. (1991). The silence: The asbestos industry and early occupational cancer research—A case study. *Am. J. Public Health* 81(6), 791-800.
- Lynch, K. M., and Smith, W. A. (1935). Pulmonary asbestosis. iii. Carcinoma of lung in asbesto-silicosis. *Am. J. Cancer* 24, 56.
- Martland, H. S. (1929). Occupational poisoning in manufacture of luminous watch dials. *J. Am. Med. Assoc.* Feb. 9, p. 16.
- Metlife (1991). Plaintiffs exhibit in Scordino v. Metlife, *et al.* Circuit Court, Jackson County, MS. Note that several of these citations have been used in other litigation and have been referenced in Lilienfeld (1991), Brodeur (1985), and elsewhere.
- Moody (1951). "Manual of Investments" (1951) Industrials, New York.
- Nordman, M. (1943). Die Staublunge der Kieselguhr Arbeiter, *Virchow Archiv F. Path. Anat.* 311, 116-148.
- Pellegrino, E. D. (1987). In "In Search of the Modern Hippocrates," (R. J. Bulger, Ed.), pp. 48-53. Univ. of Iowa Press, Iowa City.
- Podwyszożki, W. (1910). *Beitr. Z. Path. Anat. Allg. Path.* 47, 270.
- Smith, B. E. (1981). Black Lung: The social production of disease. *Int. J. Health Serv.* 2(3), 343-359.
- Vigliani, E. C., and Mottura, G. (1948). Diatomaceous earth silicosis. *Br. J. Ind. Med.* 5, 148.
- Vorwald, A. J., *et al.* (1951). Experimental studies of asbestosis. *Arch. Ind. Hyg. Occup. Med.* 3, 1.

November 6, 1951

CONFIDENTIAL

Search Magazine Article on
Diatomaceous Earth

PLAINTIFF'S
EXHIBIT

5293.0

ENCLOSURE, N. J.

About one month ago the Bureau of Adult Health was visited by Mr. Robert Goe, the managing editor of Search Magazine. Several members of the Bureau staff met with him. He was interested in writing stories concerning occupational health hazards involving the lungs, and in exploring the various fields of interest in California he became interested in the diatomaceous earth problem. Our Bureau pointed out that we could not release to him any specific information concerning our plant studies, but suggested that he obtain information on the subject from the Johns Manville Company and its medical people.

About two weeks after this, the writer received a telephone call from Mr. Goe, who reported the following: He had done a good deal of research into the problem and among other things had read all of the available scientific literature on the subject and visited Lompoc, the plant, and various people in the community as well as the Santa Barbara County Health Department and Santa Barbara County Tuberculosis Sanatorium. In the course of his reading he discovered that the only scientific articles available on the subject were those of the Italian workers. He came to the plant at Lompoc with the intention of writing an informational article concerning diatomaceous lung disease and complimenting the company on its efforts to control the dust hazard. However, he was met with hostility on the part of the company and their advice that he not publish the article. He subsequently met with a similar reception on the part of various other people, including Dr. William Shepard, whom he consulted on returning to San Francisco. Dr. Shepard advised him not to write the article. While in Santa Barbara County he visited the County Tuberculosis Sanatorium and was told by Dr. Caldwell, the supervisor, that there were at that time four cases in the sanatorium of combined tuberculosis-silicosis from diatomaceous earth. He also conferred with a Mr. Grossman, an attorney in Lompoc who handles cases for claimants, who showed him records of 8 cases of pneumoconiosis from diatomaceous earth in which Grossman had effected some type of settlement. Various physicians in the community were uncommunicative on the subject although they apparently knew about it. Dr. Busby, the head of the Tuberculosis Section of the Santa Barbara County Health Department, would not discuss the subject in his office, but later visited the California Tuberculosis Association and was generally uncommunicative on the subject. At this time Mr. Goe wrote a story on the disease, which was essentially a straight description as culled from the Italian literature. It was read over the phone to the writer and appeared to be a straight factual statement in agreement with the known facts about the disease.

Dr. Carnes, pathologist at Stanford Hospital, had done several autopsies of diatomaceous earth cases while he was at Saranac. When first contacted by Goe he was interested in a conference on the subject. About a week later, he seemed no longer interested.

On Sunday, November 4 the writer received a telephone call from Dr. Dyar saying that Dr. C. E. Smith of U.C. School of Public Health was desirous of having a conference with us on the matter of a possible "newspaper scandal" or "newspaper stink" about the diatomaceous earth situation at Johns Manville. Dr. Dyar knew nothing else about the situation.

November 6, 1951. In the morning I spoke over the telephone with Mary White, the editor of Search Magazine, a superior to Mr. Goe. Miss White stated that she was with Mr. Goe on the trip to Lompoc and confirmed the story described above. She also stated that subsequent to his first contact with Dr. Shepard, Dr. Shepard again contacted Mr. Goe and suggested to him that it would be better for him not to publish the article, apparently the same article which had been read to me over the telephone. She also explained that Mr. Goe had mentioned this matter to Mr. Milton Silverman, a science writer for the San Francisco Chronicle, and Silverman expressed great interest in the subject, saying that he had thought of doing a story on it some time ago and was now quite interested. He telephoned Dr. C. E. Smith of U. C. School of Public Health, apparently to verify some of the facts in the case and it was apparently for this reason that Dr. Smith knew about it and called the meeting for later this day.

On the afternoon of November 6 a conference was held at Dr. Smith's office with Dr. Smith, Drs. Dyar, Kriete, Byron Hubbard and the writer. The article, which was the same one read to me by Mr. Goe over the phone about two weeks before, was on Dr. Smith's desk with a note attached from Mary White, on which was written her opinion that there were some aspects of this situation which were "odious," implying that facts about the situation were being suppressed by certain people and also that there was apparently some question raised as to whether cases of diatomaceous earth pneumoconiosis entitled to workmen's compensation were being denied their just compensation. This note and the article itself were read by all present and all agreed that the article was quite unobjectionable. Dr. Abrams reviewed the situation, including work of the Bureau with the Johns Manville plant. Dr. Kriete raised the question as to whether the Bureau had done all that it should be doing in connection with getting improvements at the Johns Manville plant. He also wanted to know whether we had informed Division of Industrial Safety and what their responsibilities were. Dr. Abrams pointed out that Division of Industrial Safety had participated in much of our past contacts with the company and had actually requested some of our previous studies and were generally aware of the situation. It was felt that it would be well to inform Division of Industrial Safety at this time of the entire situation and prompt them to get into the picture. With regard to the question of compensation, it was pointed out that this matter is purely the concern of the Industrial Accident Commission and that we in the Health Department had nothing to do with it. It was suggested, and Dr. Smith made a note to inform Miss White and Mr. Goe, that they should take this matter up with the Industrial Accident Commission. Dr. Smith, in answer to a question from Dr. Kriete, disclaimed any possibility of coercion on the part of certain people in suppressing this article.

Subsequent to this meeting another telephone conversation was had with Robert Goe. He said that he thought that he would hold the article over until their January issue to give him an opportunity to get more facts in the case, particularly with regard to the Industrial Accident Commission aspects.

Herbert K. Abrams, M.D.

HKA:mnw

cc: Dr. Dyar
Dr. Kriete

★ ★ ★
★ ★ ★
★ ★ ★
★ ★ ★

THE DIATOM SEARCH

Several million years ago in the Miocene age, the San Rafael Mountains emerged from the Pacific and vast bodies of diatomite ooze—made up of microscopic shell fish—drained from the slopes and was caught in the low foothills east of Point Conception in Santa Barbara County.

These deposits of diatomite were to set the stage, countless centuries later, for great efforts by men of industry—and for a period of disease and death to men of labor.

Technically known as diatomaceous earth, SiO_2 —from 80 to 90 per cent silica, the diatomite ooze solidified into huge grey deposits of unbelievably light material that man one day found suitable for insulation, dynamite, furnace brick, glass wax, polishes, filter agents and concrete. Then the diatom demonstrated the price it would exact from the men who dug it from the earth.

Simple classical free silica dust is a well-known hazard of most every type of mining, and the varieties of resultant silicosis have been generally included in the term Pneumoconiosis. They have well-established pathological and clinical histories and have been largely brought under control by industry and medicine.

Pneumoconiosis developing from diatomaceous earth, while clearly not affecting the vast numbers of workers as represented in other mining industries, has for thirty or more years puzzled the experts. To bring some light in the subject, Search reporters talked to doctors, lawyers, hospitalized workers, representatives of public health agencies, and borrowed freely from the works of Vigliani and Motura, two Italian doctors who have prepared the most complete analysis available on their findings in the diatomaceous earth industry in their country.

Crude amorphous diatomite (silicon dioxide) is dug from open pits and carried to cyclones and grinders in the mill, where it is reduced to powder. It is then subjected to temperatures up to 1,250 degrees centigrade, transforming the crude diatomite earth into microcrystalline cristobalite—each grain visible only by microscope. The refined diatomite is then

to spontaneous lung collapse, owing to the presence of numerous air bubbles between the connective tissues beneath the pleura in the apex of the lung; (4) absence of a typical nodular stage as seen in classical simple silicosis. The formation of fibrous tissue set up by inhalation of diatomaceous earth seems more diffuse than nodular. This area of diffusion continues to grow after the irritant starting it has ceased to act.

The reason for the difference between the mild silicosis observed among workers in the crude diatomite and the malignant silicosis observed among the workers in refined diatomite lies, say the Italians, in the fact that the ignition process reduces the somewhat harmless crude material into microscopic particles which can be inhaled in large quantities within a much shorter period of exposure.

The problem of making a diagnosis of silicosis or pneumoconiosis from diatomaceous earth is threefold. In nearly every visible stage it has all the appearances of tuberculosis in the X-ray. While tuberculosis seems to enjoy the company of diatomaceous dust, routine laboratory examinations will determine whether or not it is present.

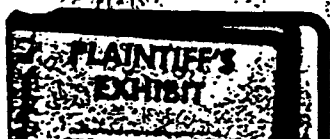
In the early stages it is extremely difficult (without autopsy) to distinguish between silicosis from diatomaceous earth and that caused by other dusts. And thirdly there is not enough clinical and autopsy experience on record to give the general practitioner or the hospital diagnostician a source for information as to the stage of the disease or the course it may take.

In the tuberculosis sanatorium at Santa Barbara there are at present four patients who have silicatuberculosis. Their length of exposure to diatomaceous earth dust ranges from one to ten years before silicosis became evident. They were hospitalized only when tuberculosis became evident. The record does not show that they had previously been diagnosed as silicotic. Another case on record was exposed for a period of one year and did not show evidence of silicosis from diatomaceous earth until diagnosed by Navy doctors nearly ten years later.

Since there are not sufficient records available to determine the degree to which this type of silicosis is responsible for or contributes to death, the immediate problem centers on (1) the disability the patient inherits as a result of the disease, and (2) securing accelerated public and private laboratory and medical investigation among the multitudinous industries who use diatomaceous earth products.

Where disability is concerned the Industrial Accident Commission has heard numerous cases in recent years and has granted a settlement. They recognize that injury from silicosis is permanent and without cure, and that the disabled worker is in for a life

Will - The First Search Story - Page 66



Governor Warren—I am convinced we will enter upon a new era of progress in the cause of health when we make it possible for every one of our people to protect himself and his family from economic disaster of bills.

I believe it is the responsibility of the states to undertake to help doctors, hospitals and the public they serve in the solution of what up to the present time, has been an insoluble hospital and medical problem.

Carbon dioxide inhalation has been added to the other therapeutic techniques being carried on at DeWitt State Hospital, in the hope that evaluation of the results will add to existing knowledge about this therapy, according to the State Department of Mental Hygiene.

One of the few specific treatments left for the hospital on an institutional level is the carbon dioxide treatment. Mixed with oxygen, carbon dioxide is inhaled through a mask, not for the effect of the carbon dioxide, but to cut down on the oxygen intake and produce a mild oxygen starvation. The most often advanced theory of why this treatment works is that some physiological alteration in the functioning of the brain takes place so as to produce an altered pattern of behavior.

It is one of the treatments used for seriously affected psychoneurotics. In most cases neuroses—the most common form of all mental disorders—can be treated privately by psychiatrists or at out-patient clinics by individual psychotherapy. However, a few cases require hospitalization if ordinary methods of dealing with neurosis fail. In such severe cases the inducing of an altered pattern of behavior—in this case, by carbon dioxide inhalation—is employed as a treatment technique.

either made into bricks or bagged in powder form for shipment. According to workers in the mills, the dusty areas are mainly in the bagging process and inside the railroad cars, and, of course, in the same car when it is unloaded at its destination.

The Italian experts agree that the crude diatomite causes at most only mild silicosis. Ordinary precautions, respirator masks, local exhaust systems, and wetting methods control the dust adequately. There is, however, definite indications that the refined microcrystalline cristobalite (produced by the heating, or ignition process) creates a hazard not as yet adequately measured in this country.

Doctors Vigliani and Mottura of Italy* have observed cases of ad-

*J.A.M.A., Jan. 15, 1949.

vanced silicosis caused by inhalation of diatomite dust among workers employed in the manufacture of filter candles. Twenty workers in two factories making these candles for more than one year were examined in the two factories, 13 were silicotic; of these, 7 were in an advanced stage and one had open tuberculosis.**

**There is wide divergence of opinion as to whether silica dusts play an active part in the development of tuberculosis. Research projects along this line are being conducted at the Trudeau Sanatorium Laboratories at Lake Seranac, New York.

From 1944 to date, 2 workers have died, one of silicotuberculosis and the other of silicosis; several became incapacitated and were obliged to leave work; 6 were pensioned.

According to the Italian doctors, the most important feature of the ignited diatomite dust silicosis appear to be: (1) rapid development and

Notes on Visit to Santa Barbara, December 5, 1951 - Diatomaceous Earth

Visit made by: H. K. Abrams, M.D. and W. D. David, M.D.

Narrator: H. K. Abrams, M.D.

Persons seen: Dr. Joseph T. Nardo, Health Officer, Santa Barbara County;
Dr. Lauren F. Busby, Director of Tuberculosis Control for Santa Barbara City and County Health Departments;
Mr. Frank Harader, Executive Secretary, Santa Barbara County Tuberculosis Association;
Dr. David M. Caldwell, Director of Tuberculosis Hospital, Santa Barbara County.

Purpose of visit: To further explore the problem of diatomaceous earth pneumoconiosis.

Drs. Nardo and Busby: We conferred briefly with Dr. Nardo, who was friendly to the idea of a further study of this problem to properly evaluate its importance. He referred us to Dr. Busby to work out details. I told Dr. Busby that recent re-examination of this problem led us to believe that it was more important than we had hitherto thought. We were thinking seriously of doing a state-wide, if not nation-wide, study of it. Dr. Busby's first comment was, "It is about time you realized that." Dr. Busby sees only the diatomaceous earth cases that happen to come into his X-ray clinics. He keeps a card file and X-ray film file arranged by alphabet according to name of patient. Therefore it is not possible easily to pick out the cases of pneumoconiosis from the others. However, he has started segregating these cases in his card file but has not progressed very far since he has several thousand cards. Moreover, he is working only on the records as far back as about 1946, when he took this job. His records also contain very little or no clinical or occupational history. They contain merely the name, age, and other identifying data and the clinical and X-ray diagnosis. He states that he keeps the histories "in his head." He has no statistical help in arranging his files and he would welcome assistance. I offered him the possibility of assigning for a limited period of time one or two of the Bureau personnel to set up a proper filing system which would permit cross filing and easier access to the wealth of information which the records in this department have accumulated over the years. He would welcome such help and awaits a further contact from us.

During the time we spent with him, approximately an hour, he was able to recall the following cases of pneumoconiosis from diatomaceous earth, entirely by memory. All of these people were exposed at the Johns-Manville Plant in Lompoc.

TB Max Romero - combined with tuberculosis. Now at the Santa Barbara County Sanatorium, Age 48 in 1946 when diagnosed.

TB Julio Becerra - Combined with tuberculosis. Was a patient at the sanatorium. Young woman.

W. A. Snyder.

TB Mrs. Mary J. Watkins - Combined with tuberculosis. ^{Was} Now at the sanatorium. Her exposure was in connection with sewing of bags at the Johns-Manville Company, Lompoc. Age 43.

PLAINTIFF'S
EXHIBIT

5294.0

TB Vincent Grossinni.- Combined with tuberculosis. ^{Was} ~~Now~~ at the sanitorium.

TB Joe DeLira - Combined with tuberculosis. Now said to be a tractor driver.
Present location unknown. Age 37.

Howard Downing.

John Fagaragon.

Donald Ashe - Worked as a chemist for one year at Johns-Manville. Is now working with the Sea Bees, U.S. Navy, Port Hueneme, California. He was diagnosed as an uncomplicated pneumoconiosis with linear fibrosis and emphysema, but no disability. This occurred a year or more ago. Young man.

Victor Stradiotto - Now probably living in Lompoc.

John C. Sells - Now said to be living in San Diego. Age 81.

Frank Winters - Age 54. An electrician at the plant for 20 years. Now has diatomaceous earth pneumoconiosis. Dr. Anderson told him "to leave" but Mr. Winters states, "This is the only skill I have. Where can I go now?"

TB Melvin McCollum - Now a patient at the Tuberculosis Sanitorium with combined tuberculosis, pneumoconiosis. Was diagnosed in 1947 at the age of 36. He was a foreman at the Johns-Manville Plant in Lompoc.

TB Howard Winn.- Combined with tuberculosis. Now at the sanitorium.

Charles Batkin - Has been at the sanitorium. He has a pneumoconiosis and possibly tuberculosis.

Kenneth Main - Age 35 in 1947, when he was diagnosed as an early case of pneumoconiosis. He may be still living at Lompoc.

Leland Steffansen - Age 51 in 1950, when diagnosis was made of pneumoconiosis.

John Tonelli - Age 35 in 1950, when diagnosed as pneumoconiosis.

A. G. Rohlfen - Age 59 in 1951, when diagnosed as pneumoconiosis.

_____ - Name of man not remembered by Dr. Busby. He was last living in San Diego and recently died. Dr. Busby understands his lungs were sent to Saranac recently.

The following information was also given by Dr. Busby. The Great Lakes Carbon Corporation, which is the second largest producer of diatomaceous earth, operates a quarrying plant about five miles west of Lompoc and they are also building a processing plant just outside of Lompoc, which may have already started operations. He stated that he is desirous of visiting these plants with us and would be glad to drive us out in his car any time we could come out. (In the county, also, is another mining company, the product of which Dr. Busby is not familiar with, called the Airox Company, located in Casmalia, Santa Barbara County. He also stated that he just recently picked up a case of silicosis in a man working at the water reclamation project tunnel at Goleta. The contractors are the Halverson Company. He states that the man also had a history of hard-rock mining.)

There are five doctors practicing in Lompoc. The older ones are: Anderson, Heidges, and Duncan; and the newer ones are Holloway and Foley. Dr. Truax, the former Johns-Manville Company physician, is still living in Lompoc, but not practicing.

Dr. Busby stated that he has talked with both Dr. Caldwell and Dr. Kupka concerning doing a mass X-ray survey in Santa Barbara County. He is in favor of it and states that Dr. Caldwell is very enthusiastic about it. There are now 30 beds vacant at the Tuberculosis Sanitorium. Dr. Caldwell feels that there is more tuberculosis in the county needing care.

Mr. Harader, of the Santa Barbara County Tuberculosis Association, is also very anxious to do such a survey.

Visit with Mr. Harader, Executive Secretary, Santa Barbara County Tuberculosis Association. Mr. Harader also believes that the diatomaceous earth situation needs more attention. He is anxious to do a mass X-ray survey of the entire county to find not only cases of tuberculosis but also cases of pneumoconiosis. He states that the Tuberculosis Association does not own its own X-ray equipment but can rent the equipment from the Ventura County Association at the rate of about \$50 a day. He will cooperate with us in any industrial study which we may desire.

Visit with Dr. Caldwell, Director of the Santa Barbara County Tuberculosis Hospital. We had lunch and about three hours with Dr. Caldwell in discussion of the diatomaceous earth problem. Dr. Caldwell came to the sanitorium in about 1946. He stated that if he had never heard of diatomaceous earth he would most likely diagnose most of the cases he has seen as tuberculosis. It was his first impression that cases of tuberculosis which occurred in patients having pneumoconiosis did better with their tuberculosis than uncomplicated cases. However, he has since revised his first impression and feels that while the tuberculosis lesion on X-ray film seems to be modified by the presence of diatomaceous earth pneumoconiosis, the clinical course is not improved but is actually worsened. He proceeded to give us detailed histories and show us films of several cases now in the sanitorium. In general, these cases have been characterized by improvement while in the sanitorium but have all sooner or later returned to the sanitorium with hemoptysis, loss of weight and other symptoms. He now feels that the prognosis is poor.

As in the case of Busby, the records of the Tuberculosis Sanitorium are also not in a state by which the pneumoconiosis cases can be picked out very easily. However, he told us of several cases that he has seen since 1946 and the clerk of the hospital was able to find the names of several others that she could remember since about 1943. However, the hospital was established in about 1930 and there are many records which have never been analyzed. Dr. Caldwell would be grateful for any statistical help we could give him in digging out the cases of pneumoconiosis and would help any person we could assign. He gave us the following names of patients who were diagnosed with diatomaceous earth pneumoconiosis which could be remembered since about 1943:

Joe Delira, James Olivera, Juan Valdivia, Floyd Gillian, Antonio Orso, George Mello, Julio Becerra, Melvin McCollum*, Ed Williams*, Charles Batkin, Max Romero*, Howard Winn*, Norberto Magdaleno*, Mary J. Watkins.

* Now at sanitorium. Williams is employed as maintenance man.

Of this number, five are at the present time patients in the sanatorium. Mr. Ed Williams was diagnosed as uncomplicated pneumoconiosis about four years ago on a pre-employment examination when he applied for a job at the sanatorium as a janitorial worker. Because he needed money, he made a compromise and release settlement with the Johns-Manville Company for \$1,000 several years ago.

The following four have combined tuberculosis and pneumoconiosis, and their course can be described as one of intermittent improvement and remission with a gradual down-hill course. They are Magdaleno, McCollum, Romero and Winn.

Eliminating the duplications in names given by Busby and Caldwell, there are a total of 26 people with diatomaceous earth pneumoconiosis, with or without tuberculosis that were given to us by Caldwell and Busby. These cases date only from 1943 or later. A complete list of these names is attached. This list should be checked with the records of the Industrial Accident Commission. It was Dr. Caldwell's belief that Mr. Melvin McCollum had not made a claim and that his expenses at the hospital were being paid for by the Johns-Manville Company. He did not know definitely whether the others had made claims for compensation.

Mr. Howard Winn first entered the sanatorium in 1946. He had worked at the Johns-Manville Company in Lompoc for eight years until May 1942. He has been told nothing by the company concerning his physical condition, even though they had done X-rays on him. He has both tuberculosis and pneumoconiosis. Dr. Caldwell showed me the minutes of the meeting of the Santa Barbara County General Hospital staff on December 14, 1950. They contained a report of a talk Dr. Anderson, the medical director of Johns-Manville Company in Lompoc, gave before the society on the subject of diatomaceous earth pneumoconiosis. The following quotes were taken from these minutes.

1. "All powders in their various steps can cause linear lesions. The progressive conglomerate lesions are probably due to crystabolite and trydimite, which do not nodulate as in silicosis."
2. "Diatomaceous earth pneumoconiosis symptoms are the same as the symptoms of silicosis, the difference being that diatomaceous earth pneumoconiosis causes disability and death, while silicosis causes disability only."
3. "These patients (diatomaceous earth) probably are more susceptible to tuberculosis (than those with ordinary silicosis)."

Action:

1. Statistical help to Busby and Caldwell to search out all cases of pneumoconiosis (both ordinary silicosis and diatomaceous earth silicosis) and set up a better filing system.
2. Check all names given by above with Industrial Accident Commission compensation records.
3. Medical-engineering study of plants of Johns-Manville Company and Great Lakes Carbon Corporation in Lompoc area.

STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC HEALTH

RECEIVED

DEPT. OF ADULT HEALTH

MEMORANDUM

To: Dr. Herbert K. Abrams
through Mr. Fred R. Ingram

Date: December 19, 1950

From: Mr. Paul E. Caplan

Subject: Monthly meeting of the Santa Barbara County Hospital Medical Staff

On December 14, 1950, Dr. Nardo, new Health Officer of Santa Barbara County, invited me to the dinner meeting of the above organization. Main speaker of the meeting was Dr. Walter Anderson, who spoke on Pneumoconiosis produced by diatomaceous earth. After his talk he showed chest x-ray slides of many of the employees of Johns-Manville.

Important points that he brought up were (1) 108 disabling cases of pneumoconiosis have been recorded at Lompoc within the past 20 years, with 18 deaths. Many cases of progressive conglomerate lesions have been observed with exposures of 1 to 2 years to the dust. One case was observed after a 7 month exposure.

(2) The conglomerate lesions which are disabling are caused by the processed powders, which change the amorphous silica to cristobalite (60%) and tridymite (2%). The relative toxicity of these two crystals compared to quartz is: quartz 5, tridymite 8, and cristobalite 9.

(3) ^{ya}Inter-venous inoculation of animals by Gardner with the untreated diatomaceous earth caused fibrosis and death to the animals.

(4) The typical x-ray pictures of this pneumoconiosis are very different from typical silicosis pictures. There is not the typical nodulation but sometimes a pseudonodulation is observed. Instead of the arterial systems being involved, as in the case of silicosis, pneumoconiosis due to diatomaceous earth involves the venous vascular system.

(5) Lanza says that the incidence of T.B. at Lompoc is no higher than at Santa Maria (supposedly a comparable community) but Anderson thinks that the residents at Lompoc are more susceptible.

✓ I was unable to talk with Dr. Anderson after the meeting, but on the previous day, I had made arrangements with Mr. Legge and Mr. Wilson, of Johns-Manville to do a sizeable engineering study there this February.

PEC/ld

Paul E. Caplan
Paul E. Caplan

Reprinted from AMERICAN JOURNAL OF PUBLIC HEALTH, Vol. 44, No. 5, May, 1954
Copyright by the American Public Health Association, Inc., 1790 Broadway, New York, N. Y.

Diatomaceous Earth Pneumoconiosis

Some Sociomedical Observations

HERBERT K. ABRAMS, M.D., F.A.P.H.A.

An occupational disease hazard became the focus of publicity in the lay press and a strike issue. Subsequent investigation of workmen's compensation records and other aspects revealed valuable information concerning the disease, the administration of workmen's compensation, medical testimony, and related factors. Accelerated steps to abate the hazard followed the events mentioned. Suggestions are made to avoid such difficulties in the future.

† In a recent issue of the Chemical Worker,¹ official publication of the International Chemical Workers' Union (AFL), the following news item appeared:

The seven-month long strike of ICWU, Local — . . . has finally ended . . .

Many gains were won . . .

Most significant of all, however, was the union's achievement in gaining recognition of the presence of a health hazard in the plant, in which the product diatomaceous earth is mined, and the final agreement by the company to take steps to eliminate the condition.

While many workers in the — plant had contracted pneumoconiosis and while many workers have already died from this dread disease, the company, had, for years, consistently refused to recognize the existence of this work-connected disease.

The main issue in the long dispute between the union and the company was the union's demand for the elimination of this health hazard. They were fighting for a principle and, in fact, for their very lives. . . *

This news item probably has been seen by no more than a few thousand members and families of the Chemical

Workers' Union. However, the announcement culminates an episode which has deep implications for the public generally and for industry and the medical profession particularly.

The story of this little known disease with the formidable name is an interesting incident in the history of American industrial medicine. The occasion is not appropriate, nor is there adequate space, to attempt to relate it here in any detail.

Rather, this report is an inquiry into some of the factors operative in the progress, or lack of progress, of industrial health. For example, in this disease, there was a long time lag between the first medical publication on the subject and its general recognition as an occupational disease. To be sure, the history of industrial medicine reveals other examples of this: beryllium lung disease has only recently emerged from a somewhat similar evolution and coal workers' pneumoconiosis is at this very moment awaiting general recognition, although the facts have been available for some time.

Downing,² as recently as 1952, wrote:

It is apparent in the study, control, and prevention of occupational health hazards . . . that the United States is not on a par with other countries. Lack of recognition of the importance of industrial skin cancer stands out in sharp contrast to the unrestricted and wide publicity given this important matter in England, Germany, and Switzerland, where these cancers are notifiable and compensable diseases and information regarding them, therefore, is relatively reliable. The history of industrial medicine here is full of failures to prevent the unnecessary deaths in industry that have occurred, for example, from

* In this and subsequent quotations the author has deleted all identifying names.

For 20 years following this publication nothing further appeared in the United States medical press as recorded in the Cumulative Medical Index. However, several European reports on human disease were published^{4, 10, 11} and before and after this date some experimental work with animals has been reported.¹²⁻¹⁴

Since 1938 physicians for the industry had been collecting and examining clinical and pathological material (at least 22 lung specimens and 100 cases).⁶ This material provided convincing evidence of the existence of a disabling occupational lung disease. Yet, according to Johnstone¹⁵:

In 1945, Gardner came to California to study the diatomaceous earth industry, to review collective X-ray films of the workers, and to consult with physicians engaged in caring for these men. In viewing the films of men who had worked for years in this material, Gardner wrote later to one of us that "silicosis is conspicuous by its absence". . .

It was not until about 1946 that physicians connected with the industry began to acknowledge that diatomite could cause a disabling and sometimes fatal disease.

Reporting

Under California law employers and physicians are required to report to the State Department of Industrial Relations cases of occupational injury and disease that cause absence beyond the day of occurrence or require more than first aid medical service. Until January, 1952, three physicians' reports and no employers' reports had been made (employers' reports were checked back to 1948).

Governmental Agencies

Contact of governmental public health and safety agencies with the industry in California began in about 1930 when the Legge study, previously referred to,

was made. Legge⁸ reported at that time that,

. . . a great deal of dust is disseminated in the atmosphere in certain working zones and constantly surrounds the habitations of the workers, as the plant operates night and day . . . The menace is due to vast clouds of dust which escape and endanger the immediate workers and are disseminated by the prevailing winds . . . the district where the employees reside. . .

At about the same time, it is reported the U. S. Bureau of Mines made a dust study, but no official information about this investigation could be obtained. State Health Department records indicate that certain ventilation measures were recommended to the industry, but no information could be found as to what action was taken.

In 1940 a county health officer in California inquired of the Industrial Hygiene Service (now the Bureau of Adult Health) of the State Health Department concerning a case of suspected pneumoconiosis in a former employee of the diatomaceous earth industry. The chief of the Industrial Hygiene Service visited the industry in question. In his reply to the health officer, he writes that he was informed by the plant superintendent and the plant physician that:

To the best of their knowledge no employee in this plant has ever developed silicosis. Dr. — (then plant physician) stated that pre-employment and annual physical examinations, including chest roentgenograms are made on all employees and that none of these men ever showed evidence of pneumoconiosis even after periods of continuous employment as long as twenty years.

I was unable to obtain access to physical examination or X-ray records, or to inspect the — quarries and mill on October 4, because of the company's blanket requirement that permission to enter the plant must first be obtained from the head offices in New York City.¹⁶

Active contacts of the Bureau of Adult Health with the industry began in 1944. These were chiefly for dust studies

The company has also agreed to the formation of a joint union-management Health and Safety Committee, thereby giving the union recognition which they have never had before.¹

Workmen's Compensation

The newspaper reporters had, among other things, called attention to the fact that there was information to be found in the workmen's compensation records of the state. The author set out to dig into the records of the California Industrial Accident Commission and was able to find 32 claims for compensation for alleged diatomite pneumoconiosis which came before the commission between 1930 and 1951 inclusive. In the course of this search 26 additional cases not in workmen's compensation files came to light. The work was laborious and the period of the study covered only a few weeks. Further cases would probably have been found had there been more time available for the work.

The study of workmen's compensation records was an absorbing experience. Space does not permit presentation of more than fragments of the material. However, where workmen's compensation records are as complete as they are in California—often containing the exact stenographic reports of hearings, as well as correspondence and other documents—these can be a valuable source of information for the guidance of public health programs. For example, I quote a few excerpts from the letter of a private physician presenting medical testimony for a claimant in the year 1944, who closes his statement with a series of recommendations for the prevention of the pneumoconiosis hazard in the diatomaceous earth industry:

1. That the Bureau of Industrial Hygiene in the State Department of Public Health investigate this plant and the dust hazard presented therein.

2. That the dust hazard of the employees'

homes also be similarly investigated. (At that time many of the employees and families lived in company owned houses on the plant premises—HKA).

3. That other cases now available be evaluated with respect to the pulmonary fibrosis of their lungs present.

4. That follow-up of employees who drift away with symptoms of respiratory embarrassment be made.

5. That authorities stop regarding this matter as a closed issue: namely, "Silicosis cannot be acquired in this plant."

6. That the nature of the advice given employees in whose films fibrosis is demonstrated as in this man's case in the years 1938-39, might reasonably be asked from a preventive medicine point of view.¹⁹

So far as I am aware, these recommendations were buried in the archives of the Industrial Accident Commission until their exhumation following the events in 1952 just described.

In the files of another compensation case,²⁰ there is a copy of a letter in the year 1946 from a medical consultant addressed to a top official of the industry. The letter contains a statement summarizing findings in the lungs of "six persons who have been employed in diatomaceous plants in southern California for significant periods." The statement declares that "... from the practical standpoint of control, it is apparent that serious dust hazards exist in this industry which demand immediate and vigorous action."

It has been contended by some that the "amorphous" or crude form of diatomaceous earth causes no disablement in contradistinction to the "processed" forms. Therefore, it was of interest to find in the above mentioned document the following comments:

One man — had worked only in the quarry and mines and as a consequence has been exposed to nothing but uncalcined earth. All of the others had mixed exposures to crude and calcined products . . . But if the — case can be taken as a criterion, prolonged and heavy exposure to crude diatomite results in further extension of such reaction . . .

which must always be given some consideration. It is rather gratifying to know that this man can have an exposure over a period of years and the condition is not related to dust inhalation.

In this particular instance, we are dealing with a condition which has all the earmarks of tuberculosis. . . . I think we can with certitude rule out the presence of a silicosis. . .

Since we have eliminated in our own mind the presence of silicosis, and since the dust, if it were a factor, would cast an X-ray pattern which would antedate the tuberculosis, we can readily assume that the dust is not responsible for his present incapacity. I have held to the belief for a long period of time that in silico-tuberculosis, the silicosis antedates the tuberculosis and in the absence of any of these factors, we must assume that the dust did not aggravate or predispose to his condition.

Later in the same year, 1951, the same doctor presented testimony for a claimant (employee) for compensation for this pneumoconiosis. At this time his statement was as follows ²⁴:

Here is a man who has had a two year exposure to dust that was in fairly high concentration. As you know, the dust to which he was subjected is diatomaceous earth, and the usual silica content is from 90-92 per cent. This silica is an amorphous form in contradistinction to the crystalline form which is the ordinary offender in producing the disease silicosis. Approximately 12 years ago I stated that this was a cause of death in these cases, and it did produce silicosis. . . . It is very possible that his tuberculosis existed for a good many years and may have antedated the exposure to the amorphous silica. . . .

Administration of Workmen's Compensation

The workmen's compensation study threw light on the administration of workmen's compensation at least in so far as certain types of occupational disease are concerned. It will be remembered that workmen's compensation is the earliest form of social legislation in this country. Its objectives are generally agreed to be to provide equitable

compensation for workers injured in the course of their work; to take injury suits out of the courts and thereby lighten the burden of litigation upon the employee; to reduce the burden of occupational injury on the general community; and indirectly to stimulate preventive measures.

The findings of this study would indicate that in all of these respects workmen's compensation did not measure up well to its objectives. For example, of the 32 claim records analyzed, at least 26 in the light of our present knowledge were for definite cases of diatomite pneumoconiosis. Yet, only eight of these claimants received full awards according to the record at the time this study was concluded. The average length of litigation until a settlement was reached was 16 months for the total group, with the shortest two months and the longest 56 months.

From the fragmentary data available, it is not possible to assess the entire financial burden on the taxpayer of this industrial disease. The few cases cited in a letter from a county hospital to this author cost the public at least \$20,000.²⁵ This figure does not include expenditures by the Bureau of Vocational Rehabilitation and the welfare agencies. One can only guess how much the community has paid for the forgotten men of the Legge study in 1930 and the nameless victims, many of them illiterate Mexican immigrants, who succumbed to the wasting disease in former years.

Possibly this limited experience with workmen's compensation is not atypical. In a recent appraisal of the subject, Kossoris concludes with the statement:

There is need today for stronger public concern with the inadequacies of workmen's compensation legislation and its administration. In spite of the tremendous forward strides in other social and economic areas, our compensation legislation and administration, on the whole, lag far behind.²⁶