

LETTER TO THE EDITOR

**Manipulation of Early Animal Research on  
Asbestos Cancer**

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**Key words:** history of medicine, epistemology, publication constraints, asbestos research

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It is important to place this response to Dr. Enterline's letter [1993] in a proper historical context. Beginning in the mid 1960s, workers who had been injured as a result of asbestos exposure began to sue asbestos product manufacturers for compensation. Those suits increased in number in the 1970s. To receive compensation, victims had to prove that the manufacturers knew or should have known that asbestos might injure product users. This is not an esoteric academic debate; millions, perhaps billions, of dollars are at stake.

Company correspondence has been made public indicating that manufacturers were aware of the health risks of asbestos during the time that workers were callously exposed and injured [Castleman, 1990; Lilienfeld, 1991]. For example, in 1956 Dr. G.W.H. Schepers, Director of Saranac Laboratories, wrote to M.D. Burch, of Owens-Corning Fiberglass Corporation, that "I suppose you already know that asbestos is fairly well incriminated as a carcinogen and the asbestos causes lung damage by virtue of the length of its fibers." However, at that same time, Owens-Corning Fiberglass Corporation advertisements stated that their asbestos-containing insulation product was "non-toxic," and required no special precautions of the user [Owens-Corning Fiberglass, 1957].

Since the manufacturers knew quite well and very early that asbestos might injure users, they and their lawyers have attempted to develop a revisionist analysis of what was knowable based on the published medical literature on the health effects of asbestos. Instead of focusing on what the asbestos manufacturers actually knew about asbestos, defense attorneys and their medical consultants shifted the spotlight to what the general American medical community knew. Thus, to argue in court that asbestos was not believed to be a human carcinogen until 1964, Dr. Enterline was asked by the Asbestos Information Association to prepare a review of the medical literature. During a deposition, Dr. Enterline described how he was asked to help corporate attorneys "to ultimately prepare some kind of document that would sort of help the various lawyers in the various areas in defending these cases." He went on to explain why he was selected to perform this work: ". . . (T)hey had apparently read an earlier article that I had written in 1975, which I assume stimulated this visit,

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simply pointing out that the literature as late as 1961 was still fuzzy about this relationship . . . (W)e discussed the fact that . . . much of the foreign literature had never been translated, and I indicated that while I had written several papers, I never really had done a literature review for my papers. I felt that it certainly would be very interesting to do a literature review on the relationship between asbestos and cancer" [Enterline, 1980a].

Dr. Enterline, in his response to us, makes it clear that he was aware of the asbestos companies' knowledge of asbestos risk. Given that he has read the same correspondence and unpublished studies as have we, he should also be aware of the private information and foreign translations that were available to industry researchers who publicly opposed the link between lung cancer and asbestos exposure. Their private knowledge contradicted their public position. For this reason, we are concerned that Dr. Enterline still asserts that Drs. Lanza, Vorwald, and Gardner did not support an association between lung cancer and asbestos exposure on the grounds that no animal study had established such a link. Dr. Enterline stated in an affidavit signed in 1991 that "(i)t is my opinion that if the Gardner findings of an 81.8 (percent) tumor incidence in mice exposed to asbestos had been published in a reputable scientific journal, it would have accelerated the acceptance of a casual (sic) relationship between asbestos and cancer" [Enterline, 1991]. In his review of what was known when, Dr. Enterline completely ignores the unpublished studies that contradict his assertion that Drs. Lanza, Vorwald, and Gardner did not support this association because of lack of evidence from animal studies [Enterline, 1978].

The tangential argument about what was known, when, about asbestos by the general medical community is currently being used by the asbestos industry to deprive workers of compensation. Dr. Enterline entered this medicolegal argument with his 1978 publication concerning the alleged lag in knowledge of asbestos and cancer [Enterline, 1978]. In the courts today, corporate lawyers utilize publications like Dr. Enterline's as they discuss the historic knowledge of the risks of asbestos exposure.

Two main approaches are utilized by lawyers defending the asbestos industry. The first is an epistemological argument that claims that workers do not need to be warned of a risk until a positive epidemiological study is performed in their trade. In his 1980 paper, Dr. Enterline states that "(m)any writers were convinced of a relationship (between asbestos and cancer) long before epidemiological and experimental evidence was available. Aside from the high incidence of lung cancer in asbestotics, they were impressed by the predominance of cancer in the lower lobes, the time lapse between exposure and disease, the high incidence in females, and the young age of many of the cases seen. Moreover, there were reasonable theories regarding mechanisms by which asbestos could cause cancer" [Enterline, 1980b]. This is correct, and therefore it is clear that the asbestos-cancer relationship was firmly established (without a formal epidemiological study) in the U.S. medical literature no later than 1949, when JAMA wrote, in an editorial, "the available evidence shows that the occurrence of cancer of the lung is related to pulmonary asbestosis and is not merely a possible sequela of exposure to asbestos dust" [JAMA, 1949]. More than 300 industrial and insurance companies received a summary of this editorial in the *Industrial Hygiene Digest*, a publication sent to members of the industry-sponsored Industrial Hygiene Foundation [Castleman, 1990].

The second argument put forth by the industry is that workers do not need to be warned of a risk until an overwhelming body of medical literature is published.

Enterline makes this second argument in his response to us when he states that he does not "consider the literature on mesothelioma important in the development of knowledge about asbestos prior to 1960 since very few writers seemed to be aware of it" [Enterline, 1993]. In contrast to Enterline's position, we think the publication of 13 papers on the issue prior to 1959 constitutes sufficient notice. In fact, companies that manufacture and sell dangerous products are legally required to be aware of all the literature that is generally available on the potential hazards of the products that they manufacture. Every last possible objection and potential controversy does not have to be answered before a protective public health response is mounted. The fact that a general practitioner may be unaware of the relationship between asbestos and mesothelioma does not excuse an asbestos manufacturing company from concluding, as Dr. Enterline did when he reviewed the literature, that "Few authors ever expressed doubt about the relationship between this rare tumor and asbestos exposure and by 1953, the issue was fairly well resolved" [Enterline, 1980b]. Even in Dr. Enterline's view, companies accrued a duty to warn of a cancer risk no later than 1953.

Dr. Enterline has also disagreed with our assertion that Dr. Leroy Gardner's data on cancer and asbestos were not published in order to protect corporate interests. Dr. Enterline has misinterpreted our previous letter. He writes that "Hardy and Egilman (1991) seem to be accusing Gardner and Vorwald of suppressing the results of animal studies . . . in order to protect their industry sponsors." We did not mean to "seem" to accuse asbestos corporations of suppressing these results. They actually did so. Dr. Gardner directly informed one of us (H.L.H.) that the information was not published because the sponsoring companies had the contractual right to prevent publication and enforced that right through their representative, Dr. Lanza.

Dr. Enterline goes on to "suggest" other possible reasons for non-publication of the animal experiments. Dr. Enterline writes that Vorwald's draft stated "that in Gardner's experimental notes the lesions were referred to as adenomas rather than cancer" [Enterline, 1992]. In fact, according to Gardner's notes, two of the nine tumors were fibrosarcomas, and one of the adenomatous tumors metastasized to the liver and spleen (this tumor also completely replaced the lower lobe of the left lung). Gardner also produced a draft monograph summarizing his experiments, in which he concluded, ". . . Of 11 mice inhaling *long fibre* asbestos for 15 to 24 months 8<sup>1</sup> developed malignant tumors in their lungs and 6 of them had tumors in other organs. *The incidence rate 81.8% is excessive.* Of 22 mice inhaling *short fibre* asbestos for not longer than 12 months only three developed lung tumors. *Rate 13.6%.*" (emphasis in original) [Gardner, 1943]. Dr. Gardner recognized that the tumors were malignant. In his monograph, he used the word "cancer" to describe them.

The non-publication of Dr. Gardner's research was one of many instances where asbestos corporations manipulated and influenced the scientific literature to protect their vested interests. Dr. Enterline has requested that we provide further examples of corruption of scientific literature. These examples are summarized in Table I [Castleman, 1990; Lilienfeld, 1991; Wright, 1979].

<sup>1</sup>In fact, according to Gardner's notes, 9 out of 11 mice developed tumors, which explains the incidence rate of 81.8 percent.

**TABLE I. Industry-Sponsored Studies: Data Unpublished or Manipulated**

Date	Researchers	Data	Publication
1930	Drs. Lanza and Pedley (Metropolitan Life)	44.4 percent of workers in Thetford Mines and Mills had asbestosis, including one pipe coverer.	In 1933, Lanza said (in reference to the Quebec study) "so far as we could ascertain, there is no dust hazard or asbestos hazard in connection with the actual mining or quarrying operations."
1932	Johns-Manville/Metropolitan Life	350 of 1,100 workers with asbestosis, including five packing and shipping department workers, a pipe fitter, and a watchman, found to have asbestosis.	Never published.
1936-1946	Dr. Leroy Gardner's research	See text.	No mention of tumors in 1951 publication by Dr. Vorwald, Due Kapu, Pratt.
1948	Dr. George Wright (Saranac Lab/Johns-Manville/QAMA)	Workers developed abnormal lung function tests before abnormal X-rays.	Study never published.
1949	Dr. Kenneth Smith (Johns-Manville)	534 of 708 men (75%) working in Asbestos, Quebec had fibrosis caused by exposure to asbestos.	In 1955, Smith reported that 649 of 708 employees (91%) had "essentially normal" X-ray films.
1957-1958	Drs. Braun and Truan (Industrial Hygiene Foundation)	"The number of lung cancer deaths combined with asbestosis is larger than would be expected in each cohort and in the combined cohort. This difference is significant at the 95% level using the chi-square test of significance."	"The asbestos mines in the Province of Quebec do not have a significantly higher death from lung cancer than do comparable segments of the general population."

Manipulation of the medical literature is a serious matter. The effects of such scientific misconduct can be disastrous. Dr. Lanza's misstatements of the medical literature resulted in the TLV for asbestos being set too high [Lanza, 1952; Stokinger, 1955]. This, combined with the malfeasance of asbestos product manufacturers, has resulted in tens of thousands of unnecessary cancer deaths from exposure to asbestos.

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## REFERENCES

- Castleman BI (1990): "Asbestos: Medical and Legal Aspects." Englewood Cliffs: Prentice Hall Law & Business.
- Enterline PE (1978): Asbestos and cancer: The international lag. *Am Rev Respir Dis* 118:975-978.
- Enterline PE (1980a): Deposition. *Johnston and Johnston vs. Johns-Manville and Dravo*. U.S. District Court for the Western District of Pennsylvania. Civil Division No. 79-417D.
- Enterline PE (1980b): Asbestos and cancer: The first thirty years. University of Pittsburgh (privately published).
- Enterline PE (1991): March 7, 1991 affidavit. State of Florida.
- Enterline PE (1993): Early animal research on asbestos cancer [Letter to the Editor]. *Am J Ind Med* 24:783.
- Gardner LU (1943): Proposed monograph on asbestosis. Saranac Laboratory (unpublished).
- JAMA (1949): Editorial. *JAMA* 140:1219-1220.
- Lanza AJ (1952): Asbestosis. Paper read before the Fourth Conference of McIntyre Research Foundation on Silicosis, held in Noranda, Quebec, January 28-30, 1952.
- Lilienfeld D (1991): The silence: The asbestos industry and early occupational cancer research—A case study. *Am J Public Health* 81:791-799.
- Owens-Corning Fiberglas Corporation (1957): "Equipment Insulations" publication. AIA File No. 37b2; June, 1957.
- Stokinger HE (1955): Standards for safeguarding the health of the industrial worker. *Public Health Rep* 70:1-11.
- Wright G (1979): Deposition. Civil Action No. 74-1206-2D. District Court of the County of Boulder, Colorado. March 9, 1979.

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