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Commentary

The Asbestos TLV: Early Evidence of Inadequacy

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INTRODUCTION

Evidence regarding the manipulation of important information concerning asbestos health effects has recently come to our attention. In a 1935 article, Dr. Anthony Lanza and co-workers wrote that "It is not practicable as yet to establish standards for the asbestos content of air." Others have commented on changes Lanza made to this publication at the request of asbestos companies [Castleman, 1990; Lilienfeld, 1991]. The asbestos TLV has been the subject of much discussion in this journal [Coles, 1993; Cook, 1992; Corn, 1993; Mancuso, 1993; Schepers, 1993]. It now appears that Lanza and colleagues changed their conclusions regarding acceptable standards for airborne asbestos, though they were aware of evidence that contradicted their published statements.

The publication put for by Lanza et al. [1935] was based in part on a 1929 Metropolitan Life Insurance Company study of the Manville, New Jersey, plant owned by Johns-Manville [Anonymous, 1929]. In this study, dust samples were taken from various operations in the Manville plant. The results from this sampling were later reported in the study by Lanza et al. [1935]. Three years after the 1929 study, Metropolitan Life surveyed the Manville plant for dust-related occupational diseases [Anonymous, 1932]. In this study, it was found that 327 of the 1,140 workers examined had positive X-ray findings. These "positive" cases

were divided into "pneumoconiosis" and "Asbestosis" based on exposure history. If a positive case had had previous occupational dust exposure, the case was classified as a "pneumoconiosis," while those cases with dust exposure solely from Manville employment were called asbestotics. From a table entitled "Positive Cases by Department," in the textile department, there were 115 (43% of the department) positive cases; of these, 53 (20%) were "Asbestosis."

This information would be academic, were it not for exposure information from the 1929 study. According to that report, dust exposure in the Textile Department ranged from 0.5 to 2.5 million particles per cubic foot (MPPCF) [Anonymous, 1929]. Hence, the 20% of textile department workers who had developed asbestos-related lung disease according to Metropolitan Life's criteria, had done so under these (low) levels of dust. This figure may not reflect the true risk of working in the textile department, given that workers were often transferred from one department to another.

With this, we return to the publication by Lanza et al. [1935]. In the draft, the researchers had written, "[i]t is not practicable as yet to establish standards for the dust content of air and in view of the many low dust counts in this report, compared with the U.S. Public Health Service standard for silica dust, it is possible that asbestos may cause pneumoconiosis more readily than free silica (SiO_2)."

(Lanza et al., 1931) The implication of this statement was readily understood by the corporate reviewers of Lanza's work. Commenting on a later version of this conclusion, which had substituted "granite dust" for "free silica," George Hobart made the following proposal: "Here again it may be a little late to criticize the statement, but I do not like the suggestion that there is a possibility that asbestosis may cause pneumoconiosis more readily than granite dust. The reason

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I object is that many cases of silicosis are supposed to originate in granite dust and this statement as it now reads suggests a possibility that a pneumoconiosis may arise more readily from asbestos than granite dust. I think we should, if possible, eliminate all that part of conclusion No. 6 following the semi-colon after the words 'of air' in line 2 of the conclusion" [Hobart, 1934].

The original conclusion of Lanza et al. would have been correctly interpreted in support of a standard for asbestos at lower levels than the 10 MPPCF standard for silica. As we can see, however, this conclusion was modified to conform to Mr. Hobart's specifications [Lanza et al., 1935]. Lanza was aware that evidence existed which suggested that a standard for asbestos should have been lower than the established guideline for silica. From the 1929 and 1932 studies conducted by Metropolitan Life, it can be concluded that exposures in the range of 0.5–2.5 MPPCF may cause asbestos-related lung disease. This conclusion was never published by Lanza, or any other Metropolitan Life researcher. In a book by Clark and Drinker [1935], the authors' reference unpublished Metropolitan studies to state that the insurance company "prefers to see the dust count below 5 million [ppcf], and welcomes still lower figures." We can only conclude that the 1929 and 1932 studies of the Manville, New Jersey, factory were two of these unpublished studies.

Dr. Lanza continued to mislead industrial hygienists regarding the appropriate level for protection from asbestos health effects. Toward the end of 1937, Dr. Manfred Bowditch, Director of the Massachusetts Division of Occupational Hygiene, wrote to Lanza asking for assistance in determining a standard for asbestos exposure [Bowditch, 1937]:

While asbestos is at present no very important factor in Massachusetts industry, I feel that we should nevertheless set up some sort of a figure for it and I would be very grateful if you would be willing to give me advice on this. You will no doubt feel that this is just what you don't want to do, but I hope that you will be a good guy nevertheless and give me at least what you regard as a "best guess."

Lanza responded by referencing a survey of an asbestos plant published in Public Health Reports in which the authors "state that everything considered they think five million particles is a pretty fair threshold limit for the asbestos industry and I agree with them" [Lanza, 1937]. This statement was not supported by any data presented in the Public Health Reports article [Page and Bloomfield, 1937]. In fact, the authors stated that it was not possible "to determine permissible limits of dustiness on a medical basis." Lanza did not mention to Bowditch the pertinent evidence from

Metropolitan Life's surveys of the Manville plant nor the conclusions reached by Page and Bloomfield.

A standard for asbestos of 5 MPPCF was first publicly suggested in 1938 [Dreessen et al., 1938]. The guideline remained unchanged for thirty years, despite the inadequacy of the data upon which the guideline was based. Asbestos mining and manufacturing companies were aware that the standard offered insufficient protection against the health effects of asbestos [Egilman and Reinert, 1995]. The evidence available to Metropolitan Life, Dr. Lanza, and his co-workers could have led to a rapid understanding of the need for lowering dust exposures in order to prevent asbestos-related disease. Unfortunately, the data are being published half a century too late.

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