FROM THOMAS B. BONNEY

PITTSBURGH OFFICE

TO MEMORANDUM

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April 9, 1973

RE: SUBSTITUTES FOR ASBESTOS

Recently Dr. Mearl Stanton of the National Cancer Institute concluded as a result of animal experimentation that microscopic fibers of a certain size (0.5 - 5 microns diameter and less than 80 microns long) can cause cancer in rats, regardless of the fibers' chemical composition. Should this also apply to man, it would mean that any fibrous substitute for asbestos having fibers of similar dimensions would have the same hazard as asbestos.

Furthermore, some of the proposed substitutes for asbestos may contain crystalline or amorphous silica or other potentially harmful materials that will also require some type of environmental control. On the basis of these two facts, the question naturally arises, "If we are successful in finding substitutes for asbestos, will we be getting out of the frying pan and into the fire?" In our opinion, the answer to this question is, "Definitely No!"

The present comprehensive standard for asbestos is exceedingly restrictive and expensive to those who would comply with it. One must have extremely effective exhaust systems where dust is generated, establish a respirator program, observe restrictions in the manner of handling and disposing, provide special clothing, comprehensively monitor dust concentrations every six months, provide medical examinations every year, post the area, appropriately label the raw material and maintain records. By contrast, all that is required to be in compliance with, for instance, the standard for amorphous silica is to keep the eight-hour, time-weighted exposures below 20 million particles per cubic foot (mppcf). Even if comprehensive standards were eventually developed for substitute materials, we do not believe that these standards will be as restrictive as that for asbestos. Furthermore, the limit for asbestos is now 5 fibers/cc and it will be reduced to 2 fibers/cc in 1976. Compare either one of these figures with the 20 mppcf limit for amorphous silica which is equivalent to 706 particles/cc. Even 100% crystalline silica dust has a limit of 2.4 mppcf or 84 particles/cc From these figures, it can be seen that the required engineering control for asbestos is much more stringent than for most materials that might be used as substitutes. If those actively seeking substitutes have any questions about the toxicity of proposed alternatives, they can obtain answers from the Industrial Hygiene Division.

Admittedly, Dr. Stanton's hypothesis does stand as a dark cloud on the horizon. But we must remember that his hypothesis is still unproven. Even Dr. Stanton cautions, "Direct application of our results to the problems in man would be unwise because the method of application and the high doses used are remote from the usual exposures of man to fibers, but how these materials exert their carcinogenic effect is a critical problem, and current data seem

adequate to develop a working hypothesis." There are other data in the literature that controverts Dr. Stanton's hypothesis and further work is contemplated in this area. One can expect a considerable period of time before the question is finally settled. Even if the theory proves true (and we have no reason to believe that it is at this time) there will be additional elapsed time before an appropriate standard can be written.

Until a standard is written covering all fibers having the critical dimensions, the asbestos standard will apply to asbestos and to asbestos alone. It cannot be extrapolated to cover physically similar materials.

-T.B.B

Thomas B. Bonney

TBB:mh

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