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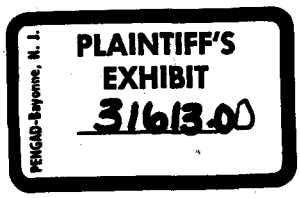

October 2, 1978

Sir Neville Stack
Asbestos International Association
68 Gloucester Place
London W1H 3HL
England

Dear Jim:

Enclosed is a copy of an unsigned article titled "Automobile Brake Linings may be a Health Hazard" that appeared in the April, 1978 issue of the American Industrial Hygiene Association Journal. Also enclosed is a copy of the paper by K. Seshan referred to in the article and comments on the article and Seshan's paper by Dr. Leineweber of Johns-Manville.

It would be appreciated if you would circulate these documents to the Chairman of the Friction Materials Advisory Panel and to other association members who might have an interest in the subject.

Sincerely,

(Signed) John H. Marsh

/as

Enclosures

CC: J. P. Leineweber, Ph.D.

HM 07681

Automobile brake linings may be a health hazard . . .

Automobile brakes — normally associated with averting danger — may, in fact, be producing dangerous substances and releasing them into the atmosphere, according to a researcher at the University of California's Lawrence Berkeley Laboratory (LBL).

The concern is being expressed by Krishna Seshan, a materials science engineer at LBL's Materials and Molecular Research Division, who has shown that automobile brake drum linings produce substances that may be hazardous to our health.

The substances that Seshan has been studying are thin, single fibers of asbestos — so thin, in fact, that even the most powerful microscopes illuminated with visible light cannot detect their presence. Looking through an electron microscope — an instrument with as much as 10,000 times the resolution of conventional light microscopes — Seshan found that the minute particles of dust created by automobile brake drums contain filaments of deformed "chrysotile" asbestos, a type of asbestos that many researchers consider a health hazard.

These fibers, according to public health officials, may not be particularly dangerous to the average citizen since people driving cars breathe, at most, only small amounts of brake drum dust. The real hazard of chrysotile asbestos, say these experts, is to workers such as brake repairmen who use compressed air to blow asbestos fibers from brakes daily and may breathe as much as a million particles of asbestos in each cubic meter of air.

Many medical experts, most notably Dr. Irving Selikoff of Mt. Sinai Hospital in New York City, contend that chrysotile asbestos is hazardous to lung tissue because such forms are minute and rough enough to prevent the mucous covering of the lung from dislodging it. Once in the lungs, asbestos never dissolves. And this substance is often found in the lungs of factory workers, construction workers, auto mechanics, office workers and even in the lungs of spouses and children of asbestos workers.

Asbestos is a mineral, says Seshan. And approximately 900 million tons of this chrysotile mineral are mined in the United States annually. Much of it is milled or woven into a blanket-like material, then used to insulate or fireproof equipment such as steam pipes, roof linings and ship hulls.

To date, Seshan estimates, about 90 percent of the asbestos used in the United States is milled under heat and pressure. And, because of these processing methods, most of the asbestos we breathe is deformed in some way or another. Still, many medical researchers in the U.S. have ignored the health problems connected with these asbestos deformations, says Seshan.

For that reason, Seshan, an expert in electron microscopy, was asked by the California Department of Health's Air and Industrial Hygiene Laboratory to help develop a method of identifying asbestos fibers found commonly in air samples. This investigation, claims Seshan, was the way in which he was introduced to the health hazards of chrysotile asbestos and how he eventually turned to the problem of automobile brake drums.

According to Seshan, most automobile brakes operate by grinding pads against a lining of heat-resistant asbestos, an action that introduces what he terms "process defects" in the asbestos fibers heated and ground against hot brake drums. Such fibers had long been suspected by many scientists to be a constituent of brake drum dust. But other researchers contended that the high friction developed in braking simply disintegrates the asbestos and leaves no asbestos fibers at all.

Neither theory could be verified, because a microscopic technique capable of illuminating chrysotile asbestos with their defects had not yet been applied. Seshan however, solved this controversy by employing a special microscopy technique.

Using what electron microscopists term a "dark field image" — a method of observing small particles by looking at the diffracted or "scattered" electrons — Seshan managed to illuminate the tiny fibers. By doing this, he not only confirmed that chrysotile asbestos is present in automobile brake drum dust, but also discovered that some of the fibers show further significant damage.

In a preliminary report on the project soon to be published in the scientific journal, ENVIRONMENTAL RESEARCH, Seshan concludes "that chrysotile asbestos fibers in various states of deformation — relatively undamaged to heavily deformed and recrystallized — exist in automobile brake drum dust."

What this means, he says, is that some of the asbestos in brake drum dust may be more of a

more on A-26 . . .

health hazard than the ordinary chrysotile form, because much of it is further deformed. And deformation in asbestos fibers, say increasing numbers of scientists, may play a significant role in causing lung disease or cancer.

"There are many factors that contribute to environmental pollution," says Seshan. "But what we have shown is that brake drum dust certainly introduces deformed asbestos into the atmosphere."

Samples for the research were prepared by G.R. Smith of the California State Health Department's Air and Industrial Hygiene Laboratory. Lawrence Berkeley Laboratory is operated by the University of California under contract with the U.S. Department of Energy.

now it's Andersen Samplers

Andersen 2000 Inc., manufacturer of the widely-known Andersen samplers and control equipment line known as HEAF and CHEAF, has sold the sampler division in its entirety, including patents, tooling, manufacturing rights and existing contracts to Thomas P. Roth, who was President of Andersen 2000 Inc. for the past eight years. Mr. Roth announced that the sampler division will be changing its name from Andersen 2000 Instruments to Andersen Samplers Inc. and that plans are underway to expand the product line as rapidly as possible. Mr. Roth further stated that the sales rate this year indicates that the company will experience its best year since inception. The new company is located at 4215-C Wendell Drive, Atlanta, Georgia 30336. Phones: (404) 691-1910 and (800) 241-6898.