Research & Engineering Center
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ENVIRONMENTAL HEALTH SERVICE PROGRAMS

The following is a brief summary of all the research programs that we have worked on for the past two years.

A. In-House Research Programs

1. Respirator Development Program

This program to develop disposable single-use respirators was started within J-M and later developed into a cooperative program with the Willson Company. Although somewhat inactive in recent months, the Willson Company will continue their work on a respirator using J-M glass MICRO-FIBER as the filter median.

2. TRANSITE Pipe Test Loop

This was a long-term study to determine the release of asbestos fiber from asbestos cement pipes under carefully controlled conditions Studied were pH ranges covering 5 to 7 and hardness from 25 to 100. In all cases, a small but measurable amount of fiber was released into the water. There was no correlation between the fiber release and the water chemistry indicating that erosion rather than corrosion is the principal mechanism involved.

3. Municipal Water Samples

Water samples were obtained on a weekly basis from the source and from the distribution system in Malvern, Pennsylvania and Glendale, Arizona. The source water from Malvern, Pennsylvania comes from serpentine-bearing rocks and contains signifi-

cantly more fiber than the source water from Glendale, Arizona. In both municipalities, there was a small but measurable increase in the fiber concentration after passing through the asbestos cement distribution system. The release of fiber was somewhat higher in the Glendale, Arizona system whose water is softer than Malvern, Pennsylvania.

4. River Water Samples

Water samples from the Connecticut River and the Juniata River have been taken on a monthly basis for one year. The entire course of the Connecticut River is through asbestos-bearing rock areas, while the Juniata River flows through an area of Central Pennsylvania where no asbestos-bearing rock should exist. Although this study is not yet completed, the results indicate that the fiber content of the Connecticut River is two to three times higher than that of the Juniata River.

5. Roofing Degradation Studies

An environmental chamber to study the release of fibers from built up roofs was built by the Shelter Products Department, and is currently in use. No significant information has been obtained from this study to date.

6. Asbestos Release from COBRA Brake Shoes

The Packings and Friction Materials Department tested the release of asbestos fiber from COBRA Brake Shoes under a variety of braking conditions on a dynamometer. Only a small fraction of the fiber originally present in the Brake Shoes is released as potentially airborne fibers.

7. Asbestos-bearing Rocks - Distribution in the United States

The available mineralogical and geological literature was reviewed to determine the various locations in the United States where asbestos-bearing rocks do or could exist. This information is summarized in the form of a map showing known

locations of asbestos minerals and probable areas in which asbestos-bearing rocks might be located.

8. Serpentine Quarry Dust

Air samples were taken before, during and after blasting in a quarry in southeastern Pennsylvania. That study indicated that the dust concentration before the blasting operation did contain a measurable amount of asbestos fiber and there could be, therefore, a fraction of fiber in the ambient air.

9. Building Demolition Studies

Air samples were taken during the demolition of two buildings covered with asbestos cement siding shingles. One of these buildings was in Easton, Pennsylvania and the other in Newburgh, New York. In both cases, an almost insignificant increase in the amount of asbestos fiber was detected.

10. Asbestos-containing Coat

The release of asbestos fiber during the handling of a coat made with a fabric containing asbestos fiber was tested. The conditions used in this experiment was identical to those used by the Public Health Service in a similar test. In all cases, the fiber concetrations to which the wearer would be exposed were below the current TLV values.

11. Polar Ice Core Samples

Samples of polar ice cores dated back to have been obtained from the Cold Region Research Laboratories. Attempts are being made to determine the amount of asbestos fiber in these samples in order to establish the background levels of fiber.

12. Fiber Analysis Techniques

This is a continuing program in which we seek to improve the techniques for measuring the amount of asbestos fiber in the wide variety of samples we are confronted with.

B. Cooperative Programs with Other Institutes or Companies

1. Inorganic Particles in Cigar Ash

This was a brief study carried out in cooperation with the General Cigar Company to determine the nature and amount of diatomite and fibrous particles in cigar ash. The principal ingredient in which we were able to detect in the ash from a reconstituted tobacco leaf was some diatomite fragments.

2. Fibers in Talc

To assist the Johnson & Johnson Company, we furnished information on the identification of asbestos-formed minerals in talc.

3. McGill University Research Evaluation Program

Our participation in this test was primarily in the furnishing of a fibrous dust for their study and a continued liaison on the test program.

4. Turner Brothers

We have been working closely with Turner Brothers Associates in England on various aspects of this problem. Considerable information relating to fiber analysis techniques has been exchanged and we have also cooperated in the analysis of samples from both laboratories.

5. Digestion of Lung Tissue

As part of our cooperative program with the Mount Sinai group, we developed a technique for the digestion of lung tissue which would allow the recovery of asbestos and other minerals with the least amount of damage.

6. Asbestos in Ambient Air

All air samples collected by NAPCA in an isolated location in Frankfort, Kentucky were analyzed as part of a Round Robin Test. We found no significant amount of asbestos fiber in these samples and have not yet received any information on the results obtained by other laboratories.

C. Sample Preparation and Characterization for Medical Research

1. Dr. George Wright

The majority of preparation used in Dr. Wright's program to determine the effect of fiber size and shape on fibrinogenic activities were performed in our laboratories. These included natural chrysotile, synthetic chrysotile, crocidolite and glass fiber.

2. Dr. Mearl Stanton - National Institutes of Health

Several fiber samples were prepared and characterized for Dr. Stanton's study relating to the cryogenic effects of fibrous materials.

3. Miscellaneous

In addition to the intensive studies above, we have shipped samples to or characterized samples for the following medical researchers:

Dr. W. E. Smith
Fairleigh-Dickinson University

Dr. Andy Reeves
Wayne State University

Dr. Ian Webster
Pneumoconiosis Research Institute
Johannesburg, South Africa

Dr. R. E. G. Rendall
Pneumoconiosis Research Institute
Johannesburg, South Africa

Dr. Paul Gross
Industrial Health Foundation

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