DR. CRALLEY:

Our next presentation is on Instrumentation by Martin N. Haller of Mellon Institute. He has a little different background than the speakers who have appeared up until now.

Mr. Haller received a B. S. in Physics from the University of Pittsburgh in 1951. After graduation, he spent ten years on an Air Force Cambridge Research and Development Program for High Temperature Electronic Circuitry. In 1961 he joined the staff of the Mellon Institute of Carnegie-Mellon University working on research services, and since that time has provided electron microscopy services to the Institute and done research in this area. He will report now on some of the research he has done.

PATHOLOGICAL STUDIES OF FERRUGINOUS BODIES: INSTRUMENTATION

Martin N. Haller*

Fibers obtained from the lungs of twenty-eight general population autopsies, male and female, were examined by electron microscopy and electron diffraction techniques in an attempt to identify the fiber core material. Since these bodies were typical "asbestos" bodies in shape (dumbbell shaped), it was thought that they were probably chrysotile, amosite, or crocidolite, with the first named mineral most likely to be that present (it is used in 90% of all American asbestos manufactured products)[1]. Because chrysotile fibers appear to be hollow in the electron microscope,[2] they are easily identified by inspection. None of the samples examined in this study appeared to be hollow, although all possessed areas free of extraneous material such as ferritin, and could, therefore, be examined for this feature. The other common forms of asbestos are opaque to electrons, so it was concluded that the fibers examined here were one of these. The fibers were next manipulated in such a way as to yield their characteristic electron diffraction patterns, so that measurements of interplanar crystal lattice spacings could be made. This technique offers unique advantages for these fibers, since selected small areas (down to 0.01 square micron) can easily be obtained in modern electron microscopes. Work with known "standard" samples of chrysotile, amosite, and crocidolite showed that useful diffraction patterns could be obtained from fiber areas as small as 500 by 500 Å, and as large as 5000 by 5000 Å. In addition, for the three minerals of interest here, typical "layer line" diffraction patterns are obtained if the fiber axis is perpendicular to the electron beam. Measurements of the diffraction patterns obtained (to an accuracy of ± 1%) showed that none of the fibers examined

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