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"Asbestos" Bodies: Their Nonspecificity

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So-called "asbestos" bodies were produced in the lungs of animals exposed intratracheally with respirable fibrous particles composed of silicate dusts or asbestos. The products of the "asbestos" bodies of asbestos bodies are identical except that "asbestos" bodies are a pulmonary response to asbestos fibers. Instead of the term "asbestos" body, the designation "silicate body" is suggested for the iron-containing structure that is a product of the inflammatory reaction of fibrous dust of unknown composition, and the term "asbestos" body is misleading and inappropriate.

THIRTY TO 10% of the people examined at autopsies in Capetown, South Africa; Miami, Florida; and Pittsburgh, Pennsylvania, were found to exhibit "asbestos" bodies in the fluid exuded from their lungs even though the lungs were generally free of chronic disease that might be considered asbestos in character.

Based on the assumption that "asbestos" bodies are the result of a specific reaction of the lungs to the presence of asbestos fibers and that no other respirable fibrous material is responsible for their presence, urban atmospheres have been declared significantly contaminated with asbestos dust and it has even been suggested that patches of minimal chronic pneumonia found in some of the lungs represented minimal asbestos caused by the polluted urban air.

Ferritin microscopy studies by Davis and Collier demonstrated the intracellular deposition of ferritin or ferritin-like granules about phagocytosed materials other than asbestos.

In order to determine whether the "asbestos" bodies were the result of a specific reaction of the lungs to the presence of asbestos fibers, synthetic asbestos fibers of 2.0 microns in diameter and 75 microns in length were administered to animals. The animals were sacrificed at intervals of 1, 2, 4, 8, 16, 32, 64, 128, 256, 512, 1024, 2048, 4096, 8192, 16384, 32768, 65536, 131072, 262144, 524288, 1048576, 2097152, 4194304, 8388608, 16777216, 33554432, 67108864, 134217728, 268435456, 536870912, 1073741824, 2147483648, 4294967296, 8589934592, 17179869184, 34359738368, 68719476736, 137438953472, 274877906944, 549755813888, 1099511627776, 2199023255552, 4398046511104, 8796093022208, 17592186044416, 35184372088832, 70368744177664, 140737488355328, 281474976710656, 562949953421312, 1125899906842624, 2251799813685248, 4503599627370496, 9007199254740992, 18014398509481984, 36028797018963968, 72057594037927936, 144115188075855872, 288230376151711744, 576460752303423488, 1152921504606846976, 2305843009213693952, 4611686018427387904, 9223372036854775808, 18446744073709551616, 36893488147419103232, 73786976294838206464, 147573952589676412928, 295147905179352825856, 590295810358705651712, 1180591620717411303424, 2361183241434822606848, 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FIGURE 1. Ferruginous body in a section of hamster lung. Animal was sacrificed two and one-half months after an intratracheal injection of filamentous aluminum silicate. Section was treated with acidic potassium ferricyanide stain for iron ($\times 1200$).

showed abundant filaments, generally in the lumen of alveolar ducts or their evaginating alveoli. The alveolar walls exhibited focally increased cellularity and an increase in argyrophilic fibers. Numerous alveolar macrophages and giant cells were seen among and around the filamentous dust.

These cells contained many short filaments and shorter, nonfilamentous fragments. Some of the longer filaments had one or more macrophages attached to them. These resembled stiff, thin wires upon which one of three

beads had been strung. The tissue reactions were typical of those produced by so-called "frost" dusts.

Some of the aluminum silicate filaments were covered by a sheath of eosinophilic material that stained deep blue with the Perl's test for iron, thereby constituting typical "adaxons," or more accurately, ferruginous bodies. As seen under the microscope, the thickened ends of the body formed a convex terminus on each side of the filament. The eosinophilic, transparent filament was clearly seen in the center of the body and often extended beyond its limits (Figure 1).

We believe that we have demonstrated the nonspecificity of so-called adaxons bodies and suggest that when these bodies are encountered in the lungs they be called ferruginous bodies unless it can be proven that they represent a response to adaxons filaments.

References

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New Weights and Measures Standards

Many of the standards and instruments used by the States in weights and measures administration were provided by the Federal Government 101 years ago or more. The National Bureau of Standards, U. S. Department of Commerce, is supervising a replacement program for the State standards to update and extend measurement competence throughout the Nation as required by scientific and technological advances. It is expected that new standards and instruments will be provided to about ten States each year until all State standards facilities have been modernized. Five states have already received these standards.

Each new set includes standards of mass (weight), length, and volume as well as the necessary laboratory instruments, including high precision balances, all specially designed to meet State weights and measures requirements. Each set costs the Federal Government about \$70,000, including calibration, installation, and training of laboratory personnel. The State contribution to the program, in the form of new or expanded laboratory facilities and better qualified personnel, will be considerably more than the Federal cost.

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