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Weapons of Mass Destruction Nuclear Explosions and Devices(Non-military)

**The Internal Environment of Underground Structures Subjected to Nuclear Blast. I. The Occurrence of Dust**

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**Abstract:** The possible occurrence of dust inside protective shelters as a consequence of nuclear explosions was studied using 18 underground structures subjected to atomic detonations during Operation Plumbbob at distances ranging from 4320 to 840 ft from Ground Zero. The existence of considerable

dust was established using sticky-tray fallout collectors. Particulates captured arose from dust on the floor existing preshot, from 'dust leaks' in some shelters, and from the internal surfaces of the structures. The latter was established by treating the walls and ceilings of selected shelters with a fluorescent dye solution and subsequently demonstrated fluorescence of captured particles. Data available indicate that the dust-collector technique will be useful in evaluating the environmental aspects of shelters tested in the future and that procedures showing fine spalling may be more sensitive indicators of structural response to dynamic loading than gross spalling. Should this indeed be established, the fluorescent method employed, or an equivalent, will become another simple routine test available to indicate structural response at greater ranges than is now possible without using complicated instrumentation.

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