its diameter was, CMD : 0.4 microns and geometrical SD : 1.7.

(2) Compartment Analysis of Clearance Curve.

Ten persons were examined for 15 hours after inhalation of the aerosolized ^{99m}Tc-Sn colloid. The total clearance curve was analyzed to be two compartments system. The rapid compartment was the clearance of the hilar region, and the slow compartment was that of peripheral airways.

The results were variable. The clearance of particles was closely related to the pattern of initial deposition. The pattern of deposition was dominated by the particle size inhaled and the pattern of patient's respiration. It seemed difficult to control these conditions strictly.

Transmission Scan of Lung

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In order to obtain a image of regional change of lung volume causing by respiratory change, so-called transmission scanning has been attempted to applicate by means of a scintillation camera recording compatible with computer processing. This method has been known to be merited without in vivo administration of radioactive materials, but with the use of transmission flux of gamma ray through body. Since logarithm of the transmission activity from a gamma ray source has a linear relation with lung density which is a composite of tissue and air, the transmission activities thus obtained might represent a degree of aeration of a regional lung region.

A patient in a sitting position with a plane phantom including 10–20 mCi of ^{99m}Tc from behind was recorded by a scintillation camera in front at various level of respitation, obtaining a transmission scan changing its intensity corresponded with a regional volumetric change of lung. In normal subject, graded change of lung volume from reserve volume (RV) to total lung capacity (TLC) was shown to be increasing activities down towards dependent part of lung. At the same time, spirometric change could also be obtained from upper and lower lung fields, which clearly showed that the spirographic change was more notable at the lower than the upper part of the lung. At a region without ventilatory change such as bullous lung, no change of transmission activities was observed at varing level of respitation. It was highly probable for this method to be used as a simple atraumatic detecting mean for so-called "closing volume" of small airway disease, where notable volume change would not appear until a certain level of respiration such as FRC.