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? WHY THE WEATHER ?

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DUST AND NUCLEI

Just half a century ago the Scottish physicist John Aitken began his epoch-making studies of the way in which moisture condenses in the atmosphere to form clouds and fog. He showed that when moist air is cooled, condensation occurs around certain particles that are always present in ordinary air. The number of these particles varies greatly, attaining values of many millions per cubic inch in the polluted air of cities and sinking to some thousands per cubic inch in the pure air of the Alps and the Scottish Highlands.

Aitken called these centers of condensation "dust particles", and the instruments that he devised for determining their number in samples of air "dust-counters". Nowadays the particles are generally referred to "condensation nuclei", as recent work has shown that they are quite different from and have practically no connection with true dust. The latter -- i.e., the minute particles of solid matter suspended in the air and large enough to be seen with a microscope -- can be counted by several instruments designed for the purpose, the international standard instrument being the "jet dust-counter", designed by Dr. J.S. Owens.

Particles of true dust are generally present in much smaller numbers than condensation nuclei. Moreover, the number of the former may be greatly increased without appreciably affecting the number of the latter. A German investigator, for example, charged the air with coal dust and dust from the beating of carpets without increasing the number of particles per unit volume of air as shown by the Aitken instrument.

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