

A Science Service Feature

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? WHY THE WEATHER ?

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"NUCLEI" IN THE AIR

That the condensation of water vapor to form fogs and clouds is due to the cooling of the air is an old story, but until the latter part of the last century an important factor in this process was overlooked. The discovery was then made that condensation depends upon the presence in the air of minute particles of some sort, mostly of ultra-microscopic size, which serve as nuclei around which the drops form.

What are these particles? They have usually been described under the indefinite name of "dust," and it was supposed until recently that all kinds of fine dust were equally effective in promoting condensation. It now appears, however, that condensation occurs mainly on particles consisting of substances that are highly hygroscopic - that have, in other words, a strong chemical affinity for water. One of these is common salt, immense quantities of which are supplied to the air by the evaporation of ocean spray and carried far inland by the winds. Others are compounds of sulphur, such as are constantly poured into the air by the combustion of fuels. The activities of volcanoes constitute still another means whereby the atmosphere is supplied with hygroscopic particles.

Recent discoveries concerning hygroscopic nuclei and their effects make it necessary to revise some of the statements and ideas hitherto embodied in books on meteorology. These books tell us, for example, that in order to produce a fog the air must be cooled below the temperature at which, with the amount of water vapor present, it is completely saturated, so that, in scientific language, its "relative humidity" is 100 per cent. Several cases, however, have lately been reported in which, owing to an abundance of salt or other hygroscopic substances in the atmosphere, haze and fog were formed with a humidity as low as 70 to 75 per cent.

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