A Science Service Feature

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? WHY THE WEATHER ? Mailed November 26, 1932

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## IONS IN THE AIR

What are the "ions" in the atmosphere that, at high levels, play so prominent a part in the transmission of radio signals, and in the air of our homes, according to some authorities, have much to do with human health and comfort? Here is a recent answer to the above question, by Dr. L. R. Koller, of the General Electric Company:

"The conductivity of the air is due to the presence at all times of large numbers of ions or charged particles. In general, the number carrying positive charges is slightly larger than the number carrying negative charges. The number of ions is also subject to great fluctuations from hour to hour and from place to place. In any one place it shows a daily as well as a seasonal variation. It is usually largest when the air is clear. It is larger in summer than in winter; larger during the day than at night, and when the temperature is high than when it is low. The number of ions increases with increasing elevation. At very high altitudes the number becomes very large and the conductivity becomes very great. This highly conducting layer is the Heaviside layer, which is responsible for many phenomena observed in the long distance transmission of radio waves.

"In recent years much information has been gained as to the nature of the ions. It is now fairly certain that they start out as atoms or molecules from which an electron has been removed, thus forming a positive ion of molecular size and a negative ion consisting of a single electron. At atmospheric pressure, however, they do not continue long in this condition, but each ion forms about itself a cluster of molecules held together by electrostatic forces. The size of the cluster depends, to some extent, on its age. These clusters probably consist of about ten molecules. These aggregates constitute the large part of the ions in air and are responsible for most of the conductivity. They are called light ions to distinguish them from the heavy ions formed by the attachment of a positive or negative ion to dust or water particles in the air. These heavy ions are called Langevin ions after their discoverer."

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