

A Science Service Feature

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? WHY THE WEATHER ? Mailed April 4, 1930.

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HOW AIR CONDUCTS ELECTRICITY

The fact that air is not a perfect non-conductor of electricity was known for generations before the reason for this was discovered. In 1900 and 1901 Elster and Geitel in Germany and C. T. R. Wilson in England found that clear, dust-free air always contains a number of positive and negative ions, and that it is the movement of these ions in an electrical field that makes the air a conductor. Its conductivity depends upon the number of ions present and ^{on} their mobility.

Air is, however, very far indeed from being a good conductor. Its resistance to the passage of electricity is so enormous that, according to Dr. W. F.G. Swann, a column of it one inch long offers as much resistance to an electrical current as a copper cable 30,000,000,000,000,000 miles long and of the same cross-section. A cable of this length would reach from the solar system to Arcturus and back 20 times.

The conductivity of the atmosphere, when expressed in this way, sounds very small, but it is far from insignificant. It is, in fact, so large that a charged insulated conductor exposed to the air loses some 3 per cent. of its charge in one minute.

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