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A Science Service Feature

? WHY THE WEATHER ?

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RECORDING LIGHTNING SURGES

Much has been learned recently about the characteristics of lightning from the records obtained by electrical engineers in both Europe and America of the surges, or sudden rises of voltage, that are set up on an electric transmission line when lightning strikes it or passes close enough to it to cause a surge by induction.

The principal instrument employed for this purpose is the cathode-ray oscillograph--a device that has been used for various scientific purposes for many years but has only lately been adapted to the study of lightning. This marvelously sensitive instrument makes a photographic record of the abrupt changes of voltage that occur at any point on a line when the lightning surge sweeps by at the speed of light--186,000 miles a second. The record is traced on a photographic film by a moving beam of electrons shot through a vacuum. No mechanical indicator would respond quickly enough for the purpose, but the frictionless beam is free to move instantly and to measure details of the passing surge that occupy less than a ten-millionth of a second; about the time required by a high-speed rifle bullet to travel the thickness of two hairs.

The records show that, in many cases, a surge due to a stroke of lightning builds up to a peak of a million volts or more within from one to ten millionths of a second, after which the voltage drops a little less rapidly back to normal.

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