FARMER'S ADVOCATE AND HOME JOURNAL, WINNIPEG



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HOW TO EXTERMINATE THEM



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earth. This condition causes charges from cloud to cloud and from cloud to earth. Once equilibrium is established there is a period of quiet, and then another period more severe than before of increasing electrification followed by thunderbolts.

ELECTRICITY IN THUNDERSTORMS. This problem has been freely discussed for several centuries; it has been attacked from many viewpoints and much laboratory work has been done in order to produce a discharge that, in a small way, may be comparable to those observed in nature. Still it cannot be said that the precise nature of a thunderstorm is known. The most recent theory is one put forth by Dr. Geo C. Simpson. Dr. Simpson has proven by laboratory experiment that when a large drop of water is broken up into smaller drops in the air the water becomes positively and the air negatively charged. In other words, when each lrop of water is broken up a certain number of units of free negative ions and a less number of free positive ions are released. (An ion is understood to be any extremely small material particle which carries a charge of electricity.)

It is further understood that every time a drop breaks a separation of electricity takes place, the water receiving a positive charge and the air a corres ponding negative charge. The charge which passes to the air is rapidly ab sorbed by the cloud particles, and in time the cloud itself may become highly charged with negative electricity. The relations of these facts to the development of thunderstorms will now be pointed out. The latter, it may be remembered, occur for the most part on warm, sultry days; the usual preliminary is the formation of a cloud with a flat base whose summits—for it generally has several-are rounded and towered far into the sky. Those rounded summits are the tops of ascending currents of warm air whose moisture, condensed by the cold of elevation, form the white dome-like structure of the cloud. The existence of an ascending current is beyond question; just what velocity the ascending air has is yet somewhat conjectural. A velocity of 18 miles an hour, however, is required by the theory under discussion. Lenard has shown that drops having a diameter greater than two-tenths of an inch are unstable when falling through the air and rapidly break into smaller drops; also that all drops having a diameter less than two-tenths of an inch have a final velocity when falling through the air, of less than 18 miles an hour. Thus it will be seen that in the ascending air currents of a thunderstorm no water can fall, provided the ascensional velocity is 18 miles an hour or greater; for all drops less than twotenths of an inch in diameter are carried upward, and all drops having a larger diameter quickly break into smaller drops.

Whatevei may be the origin of the electricity of the air, its effects upon the various terrestrial objects upon which it falls are well known. From ts effects we are able to infer that the intensity of the charge in the lightning flash varies between very wide limits Not every discharge is heavy enough to take life or badly splinter a tree, so that we can at once distinguish be-tween light flashes generally harmless and heavy flashes which splinter trees or kill live stock and human beings. A third class may also be recognized, as the violent disruptive discharges, which, as so recently pointed out, is the result of a discharge initiated elsewhere, such, for example, as when one cloud discharges to another cloud between it and the earth. When this happens the free charge on the earth side of the lower cloud will be suddenly relieved and fall upon the earth through previously unstrained air as a discharge of the most violent and explosive type. When a thur derstorm develops and moves over the land the air between the under surface of the cloud and the earth's surface is able at first to resist the passage of a discharge between B. P. RICHARDSON tion increases the strain in the air becomes too great and a discharge follows. The zone of danger in a thunderstorm is, therefore, generally equal to the area of the cloud itself, sometimes extending a little to the front of the LANDS FOR SALE

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