Man-Made Lightning Out of Doors

Physics

Man-made lightning has now left the laboratory and gone out of doors to compete with the natural article in testing electric lines. This announcement was made by the General Electric Company in revealing the first details of experiments that have been made by their engineers in the Berkshire mountains in northwestern Massachusetts.

The apparatus was mounted on a small truck, and placed at the base of one of the tall transmission towers. Outside the truck a spark gap consisting of two brass spheres was used, and from this wires led to the overhead spans. When the engineers operated the apparatus, a bolt of hundreds of thousands of volts of electricity, with all the characteristics of lightning, was sent over the lines to be recorded with a special camera operating in a millionth of a second. The records were made five or ten miles away, at Pittsfield, where the power from the Turners Falls Power and Light Company is received over the lines for distribution to the city.

Lightning, enemy of electric transmission, has been studied by electrical engineers ever since man started, a half century ago, to transmit power over wires. Today lightning is still the major source of interruption on transmission lines, but the engineers are continually developing new tools and methods of attack so that the chances of designing a lightning-proof line become better each year.

Artificial lightning generators capable of producing a half million volts were made years ago. A million volts were attained shortly thereafter, and a few weeks ago, the goal of 5,000,000 volts was reached in Pittsfield laboratory experiments. Use of such equipment led to the discovery of many additional facts about lightning voltages, but the work necessary was confined within the laboratory.

Work with actual lightning on high-voltage transmission lines was started last year, and, during a thunderstorm in the foothills of the Allegheny Mountains last July, General Electric engineers obtained a cathode-ray oscillogram or picture with its high speed camera showing the effects of a natural stroke of approximately 2,500,000 volts on the transmission wires. But lightning refuses to sit for its picture when and where desired. Obtaining the one record was a considerable achievement.

Having obtained one record of an actual lightning bolt and its effect on a transmission system, it became possible for engineers to duplicate the performance at will. Lightning characteristics had been determined, and it remained only for the investigators so to arrange their high-voltage generators that, on a smaller scale, the same type of discharge could be produced when and where desired.

Construction of a portable impulse generator then made it possible to apply surge voltages at different places along the Turners Falls Power and Electric Company lines. Approximately 40 miles long, and extending from the Connecticut River to Pittsfield, the lines were built for 110,000 volts and are carrying 66,000. The impulse generator is so constructed that the engineers have available short or long waves, and either high or low voltage.

In the early days of electricity it was customary for generating stations to be crippled during thunderstorms, and most houses had combination gas and electric fixtures, and possibly also a supply of oil lamps and candles for emergencies. Such provisions are hardly necessary today, for engineering investigations have shown how to build lightning arresters that will protect equipment against the surges caused by lightning. And the work that is being carried on today is bringing nearer that day when interruptions will be even more infrequent.

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Worms on Diet Tempt Fish

Biology

Worms placed on a scientific diet before being used as bait are more attractive to fish, than those just taken from the ground, experts of the U. S. Department of Agriculture report, and the formula for this process, known as "scouring," has been made available by the Bureau of Entomology.

According to W. R. Walton, a distant relative of the famous Izaak Walton, known as the patron saint of fishing, the worms should be placed in a container filled with moistened moss for three or four days prior to being used. Sphagnum moss, found in damp woods throughout the northern states, is preferable, but other varieties may be used.

If the worms are kept for longer than that period the diet should be varied with sweet milk every week, and the moss should be washed every ten days. At the end of a few days they become pink in color, and for some unexplained reason make the fish bite much quicker. The worm is transparent and the contents of the stomach can be seen through the skin, and the dieting process makes them of an even color which the fish regard as a choice morsel. The "scouring" process is particularly valuable for game fish such as trout, and it makes the worm more lively, tougher and easier to handle, Walton has found.

He has just published the results of a study of methods of preventing the worms from damaging lawns and golf courses, and stresses the fact that he is merely repeating an old formula given by his famous relative in 1653, as a matter of convenience for fishermen.

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Kish Traced to 4000 B. C.

Archaeology

Seven stages of human history, starting as far back as about 4200 B. C., have been traced at the ruins of Kish, most ancient great capital of Asia. A report just received at the Field Museum from Prof. Stephen Langdon, director of the Field Museum-Oxford University Joint Expedition to Mesopotamia, shows that the excavations have penetrated to virgin soil.

In the lowest level of the buried city have been found painted pottery and a large number of tablets covered with picture writing. Crude as these pictographic inscriptions are, they can be translated as Sumerian and they show that the founders of Kish were Elamites. From the depth of the soil in which the tablets and pottery were lying, Professor Langdon concludes that civilization got a start here at a period before 4000 B. C.

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