

horizon marking his tail. A quadrilateral of fainter stars above marks his body and still higher is his neck and head. In the neck you may now be able to see the star Mira, but if you had looked at this same part of the sky a few months ago no star would have been visible. Mira is a famous long period variable star, usually too faint to be seen without a telescope, but every eleven months increasing to naked eye visibility. Directly west appear the four stars that outline the corners of the Great Square in Pegasus.

The upper one is Alpheratz, in Andromeda, and the three lowest ones are part of the winged horse, Pegasus. Just north of Andromeda is the W-shaped group representing her mother, the queen Cassiopeia. Low in the northwest can be seen Deneb, all that remains of Cygnus, the swan, visible for the past few months.

The maps picture the January skies as seen at 10 p. m. on the first of the month, 9 p. m. on the fifteenth, 8 p. m. on the thirty-first.

*Science News Letter, December 29, 1934*

## PHYSICS

## Revolutionary Method of Power Transmission Urged

### Chairman of Science Advisory Board Proposes Use Of Electrostatic Generator With Vacuum "Pipes"

**E**LECTRICITY generated by enormous disks spinning in vacuum and "piped" unlimited distances along vacuum surrounded rods, carrying cheap energy from great water power developments or coal and oil fields to the centers of population, is the possibility held out by Dr. Karl T. Compton, chairman of the Science Advisory Board, in a research project recommended to President Roosevelt for federal financing.

This revolution in both the making and the transporting of electricity has been in the making for the last five years. Young Dr. Robert J. Van de Graaff is the scientist mainly responsible. The 10,000,000 volt electrostatic generator built by the Massachusetts Institute of Technology at Round Hill, Mass., is the first step toward an electrostatic generator suitable for commercial power production. The transmis-

sion system proposed, an airless pipe with a rod running through it, has probably been tested but no experimental results have been announced.

Dr. Compton in a description originally prepared over a year ago and just made available as a part of the Science Advisory Board report proposed "a radically new scheme for electric power transmission" because present methods of transmitting electrical power are limited by practical reasons of efficiency, complexity and cost to about 250 miles.

The new system should be "cheaper to install than present systems and should be capable of transmitting power to unlimited distances without appreciable loss."

It is known that there is some hope that the Tennessee Valley Authority with its large power developments may benefit from this radically new development. Several hundred thousands of dollars would finance a serious effort to develop the new scheme to the stage of useful application. The project is described as "planned and ready to start under competent supervision on short notice."

Instead of alternating current that the now-standard electromagnetic generators produce at high voltage, the new proposed generators would give out direct current at about a million volts.

The giant disks of the electrostatic machines would be surrounded by

vacuum because of the necessity of preventing tremendous sparks that might wreck the whole equipment if they were allowed to occur. The great progress that physicists have made in recent years in producing high vacuum in large spaces will contribute materially to the success of the new scheme.

If this new power production dream is realized, it will be a case of progress turning the clock back, in a sense. For the electrical machines that were used in the eighteenth-century by Benjamin Franklin and others were of the electrostatic type. They generated electricity by friction on large disks. All modern electrical generators and motors employ the principle of electromagnetics instead of electrostatics.

In the experiments with the ten million volt electrostatic generator already built, the accent has been upon its usefulness for producing artificial lightning to smash atoms and conduct research in physics. The commercial application of the scheme has been an objective about which there has been little discussion and still less definite announcement.

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## ARCHAEOLOGY

## Unearth Gold Mill of Ancient Mexican Indians

**W**HERE did the ancient Mexican Indians get their huge supply of gold?

Millions of dollars' worth of bars and jewels left America for Spain right upon the heels of the Conquest. Yet little is known of its production.

The wealthy Aztec monarch, Montezuma, told Cortez that most of his supply came from Oaxaca and other parts of southern Mexico. The Conquistadores immediately investigated his story to find Indians busy panning gold in river sands there.

Practically all of the important gold mines in Mexico today, abandoned or producing, have traditions of having been exploited by Indians in pre-Spanish times. Stone tools are even found as evidence, some hundreds of feet in the mines.

Rock was apparently broken by heating and throwing on water, fire-marks being plentifully encountered. There also appears evidence that the ancient miners used burned lime, packing it into cracks and then expanding it by slacking with water. (Turn to page 409)

## VITALISM and MECHANISM A DISCUSSION

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