

## Do You Know?

In what is called cold cathode *fluorescent lighting*, the lamp has a similar appearance to other fluorescent lighting but the cathode operates relatively cool and no pre-heating is required; when the switch is pressed it lights immediately.

The wily *crow* will abandon a tree formerly used as a roost if he detects any changes made in the vicinity of the roost; he is quick to detect such things as a dynamite bomb installed to destroy him and his flock.

The so-called "*Boston Stone*," recently rededicated in Massachusetts, is a stone two-barrel trough brought from England late in the 17th century and used for grinding oil and pigments for paint by means of large stone ball.

*Wheat* was practically the only raw material available in large quantities during the war for the production of alcohol, an essential for making munitions and synthetic rubber; corn and molasses, normal sources of industrial alcohol, were scarce.



### Measure Current Precisely With K-2 Potentiometer

Scientists at Institute for Atomic Research, Iowa State College, Ames, Iowa, chose this K-2 potentiometer for its precision and facility of use. They determine current in the magnetic coil of a Beta-Ray Spectrometer by measuring voltage across a standard 0.01 ohm shunt.

Catalog EH22(1), free on request, describes Type K Potentiometers.



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energy probably comes from ionized particles in outer space.

Scientists now believe that the energy comes from protons, positively charged particles which are part of the core of atoms, and negatively charged particles, electrons, in outer space. Radio frequency energy is sent out to earth when an elec-

tron, which has been attracted by a proton until it circles around and around the tiny particle as a comet circles around the sun, finally manages to pull away. When this happens, energy of radio wave frequency is released. This process is called free-free electron transition.

Science News Letter, September 4, 1948

#### ASTRONOMY

## Stars Eject Cosmic Rays

► COSMIC RAYS, created in the atmospheres of certain stars whose magnetic field fluctuates violently, are shot forth periodically from these stars.

This latest theory of the birth of cosmic rays is advanced by Dr. Horace W. Babcock of Mount Wilson Observatory of the Carnegie Institution of Washington.

The random directions from which cosmic rays approach the earth would thus be explained, Dr. Babcock points out. Full details concerning his new theory appear in the *PHYSICAL REVIEW* (August 15).

The number and distribution of magnetically active stars is not yet definitely known, but they are probably fairly numerous throughout the disk-shaped galaxy.

It was Dr. Babcock's continued study of the peculiar star HD 125248 that led him to picture such stars as ejecting cosmic rays. In this star, the polar magnetic field regularly changes from plus 7,800 gauss to minus 6,500 gauss, and back, in 9.295 days.

The star's alternating magnetic field sug-

gests that at certain phases the suppressing effect of space charge that tends to keep cosmic rays close to the star will be eliminated. Periodically positive ions and electrons, Dr. Babcock reasons, are ejected alternately from the polar regions of the star at certain phases of each magnetic cycle.

Lines in the star's spectrum change in intensity as indicators of the changing magnetic cycle. The width of the europium lines, for instance, is greatest when the star's magnetic field reaches maximum; the chromium lines are widest when the greatest negative magnetic intensity is attained.

About a score of these peculiar variable stars, brighter than the sixth magnitude and thus visible to the naked eye, are known. All are suspected to have varying magnetic fields. But these magnetic variations are more fundamental than the mere changes in line intensity would indicate, the Mount Wilson astronomer says.

Science News Letter, September 4, 1948

#### ASTRONOMY

## Satellite Missile Needed

► DEVELOPMENT of a satellite missile which, like a moon, will continuously circle around the earth—600 miles or so above the surface—is being seriously considered by American scientists.

This was revealed to the Association of Terrestrial Magnitude, affiliate of the International Union of Geodesy and Geophysics, Oslo, Norway, in a communication from Dr. James A. Van Allen of the Applied Physics Laboratory of Johns Hopkins University.

Such a missile would carry scientific instruments needed to collect data about the rarefied atmosphere surrounding the earth. Once started, no fuel would be needed to keep the missile circling around our planet.

In the even dimmer future is the prospect of astronomical flights into space Dr. Van Allen's statement said.

Today rockets enable scientists to explore the upper atmosphere by carrying apparatus high above the earth. Many missing links in the physics of the upper air will be filled in through the help of these instruments.

Since this rocket research began two years ago, scientists have:

1. Measured the cosmic ray intensity above the atmosphere.
2. Captured samples of air 35 miles above the earth's surface.
3. Produced smoke puffs and smoke trails at high altitudes to study wind velocities.
4. Measured the atmospheric temperature and pressure up to 40 miles.
5. Extended the solar spectrum far into the ultraviolet.

Up to July 1, some 31 V-2's had been fired with upper atmosphere equipment as the primary payload. Twenty-one of these flights have been successful, attaining summit altitudes ranging from 62 to 114 miles, with an average of 84 miles.

Data obtained through rockets have been captured by two principal methods:

1. By radio from a suitable multi-channel transmitter in the rocket to a system of receiving and recording stations on the ground. This is called telemetering.

2. By actually recovering the records produced within the rocket during flight.

It was soon realized, Dr. Van Allen continued, that captured German V-2's, converted from war to peacetime use, would provide at best a series of high altitude