

Dr. Compton advanced an energy of seven billion volts for the electron cosmic rays that are so feeble as not to reach the equator, and he set thirty billion as the figure for a more penetrating component of high speed electrified particles. The high energy portion is not affected by the earth's magnetic field, Dr. Compton held.

As to the way in which cosmic ray effects vary with increase in height over the earth's surface, there is little difference in the experimental results, but both Dr. Millikan and Dr. Compton see the experiments bolstering up their theories.

The question of the origin of the cosmic rays, a moot question upon which there is little experimental evidence except the fact that they come from outer space, was left for future meetings.

*Science News Letter, January 7, 1933*

## ASTRONOMY

## Discovery Doubles Number Of Known Be-Type Stars

**D**ISCOVERY of 236 stars in the northern Milky Way with layers of glowing hydrogen surrounding them was announced to the American Astronomical Society by Dr. Paul W. Merrill and Cora G. Burwell, of the Mt. Wilson Observatory.

These are known as type Be stars, and are especially interesting to astronomers because of some of their peculiar properties. The Mt. Wilson astronomers have been making a search for them, using the spectroscope to study the lines in the stars' spectra. As a result the total of known Be stars has been raised to 408.

*Science News Letter, January 7, 1933*

## PLANT PHYSIOLOGY

# Growth of Plants Stimulated By Proper X-Ray Treatment

**X**-RAYS can cause plants to grow faster, blossom earlier, form more chlorophyll, and in general speed up their life processes. But if they get too much of a dose of the rays, they become crippled.

This in brief summary is what Prof. Charles A. Shull of the University of Chicago has found in experiments which he reported before the meeting of the American Society of Plant Physiologists.

Prof. Shull exposed corn, wheat, oats and sunflowers to X-rays for periods of from one to five minutes inclusive, under screens to take out the harmful parts of the X-ray spectrum, and also for ten minutes without the benefit of screening. He compared the growth of these plants with "control" plants that were not X-rayed at all.

All the rayed plants except the ten-minute lot apparently were stimulated by the treatment. In some cases they became juicier, or more succulent, as well as larger. In corn a considerable increase of the green food-making substance, chlorophyll, was noted, running from 20 to 60 per cent. above the controls. X-rayed seeds carried on their respiratory processes with greater energy, the data indicating from 30 to 50 per cent. increase.

The three-minute treatment seemed to be most beneficial especially in the case of the sunflowers. Pots of the young plants ranged side by side mark off a curve with the graduated heights of

their tops: good at one minute, best at three, not so good at five, and disastrous for the ten-minute treatment without a screen. The plants were in bud at about the same time, but the three-minute group blossomed first.

The condition of the ten-minute group indicated emphatically the effects of too much of a good thing. It was badly burned, and pocked all over the leaves, as though with a mosaic disease. The leaves were irregularly lopsided, an effect not observed at all in the plants given shorter rayings under screens.

*Science News Letter, January 7, 1933*

## VETERINARY MEDICINE

## Conquest of Distemper May Protect Fur-Bearers

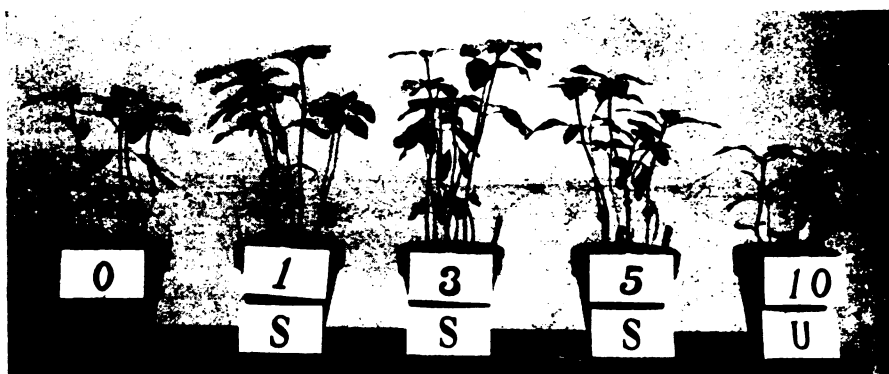
**C**OMPLETE success in protecting dogs and other animals against distemper is claimed in the final report of "The Field" Distemper Council, of which the Duke of Portland is president, as the result of ten years' research in England.

A virus, a vaccine, and an anti-serum have been produced, and a healthy dog can be given lasting protection against distemper infection by the inoculation of vaccine followed a fortnight later by one of virus. If the anti-serum, used alone, is given sufficiently early in the disease, it will lessen the severity of an attack of distemper.

A survey of the results with the vaccine-virus method showed that, where exposure to infection was certain, the incidence of distemper among 650 foxhounds belonging to 23 hunting packs was only 1.4 per cent., and the death-rate 0.3 per cent. Without inoculation the incidence among young foxhounds in England is nearly 100 per cent., and the deathrate frequently 50, and sometimes more than 75 per cent.

As true distemper has recently been found to occur among fur-bearing animals related to the dog, such as the silver fox, or to the ferret, such as fitch, mink, and fisher, these methods will have immediate value where these animals are farmed.

*Science News Letter, January 7, 1933*



**X-RAYS GIVE PLANTS "PROSPERITY CURVE"**

Prof. Charles A. Shull of the University of Chicago gave sunflower seedlings varying doses of X-rays, and found that they stimulated growth. Figures on pots indicate number of minutes' raying. Ten minutes, unscreened, hurt the plants; shorter exposures helped.