

GEOPHYSICS

Show Model Aurora

Behavior of charged particles in earth's atmosphere is demonstrated inside a vacuum tube. Soft purple halo forms in magnetic field of a model earth.

► HOW AND where the dancing colored lights of auroras form was shown in Washington by a tiny model of the earth bombarded inside a vacuum tube by electrons.

In actuality, the electrons are protons thrown out by the sun, reaching the earth about two hours later. As the particles fall under the influence of the earth's magnetic field, made by a half-inch permanent magnet inside the model earth, they form a halo around it.

This is known as the "ring current" and it is believed to carry about 180,000 amperes, compared to the one-third of an ampere in a 60-watt electric light bulb.

The halo was a soft purple glow surrounding the one-inch earth in the demonstration at the American Geophysical Union meeting by Dr. Willard H. Bennett of the Naval Research Laboratory in Washington. Mercury vapor inside the vacuum tube gives the glow as its atoms are excited by impinging electrons.

The real ring current is invisible, but instruments could detect it if and when man ever sends a satellite up to 4,000 miles above the surface.

Meanwhile, Dr. Bennett reported, he is building a bigger, more accurate model of his device "showing how charged particles behave in the earth's magnetic field." Electrons, fired with an energy of 40 volts, represent protons of about one-half a billion electron volts, much higher energies than the one to five million electron volts suggested for the solar proton stream.

Nevertheless, Dr. Bennett said, his present model gives a qualitative picture. It shows the complicated system of orbits

around the earth into which the incoming particles are thrown by the earth's magnetic field. It demonstrates that solar protons can fall to earth only in certain places, known as the auroral zones, one circling the North Pole and the other surrounding the South Pole.

The paths into which the particles are formed occupy the volume generated by rotating a crescent about the earth's magnetic poles, with the crescent's horns touching at the auroral zones, thus producing the ring current, which is brighter in spring and fall in the device as auroras are known to be.

When the model earth, on which longitude and latitude lines are painted a fluorescent green, is adjusted to represent summer and winter, the pattern changes slightly. It then shows local intense auroras, which are often followed by magnetic storms interfering with long-distance communications by shortwave radio. The ring current is still present, but it is less intense.

Dr. Bennett's model demonstrates that auroras are generated at the same time in both the Northern and Southern Hemispheres, which has not been established by observations. Scientists hope to confirm the simultaneous appearance of auroras in both hemispheres during the International Geophysical Year, scheduled for 1957-58.

His device is called the Stormertron, after the famous geophysicist Prof. Carl Stormer of the University of Oslo in Norway. The existence of a ring current surrounding the earth was first suggested by Drs. Sydney Chapman, V. C. A. Ferraro and D. F. Martyn on theoretical bases.

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said, "but we would produce fewer psychopaths and less crime."

Dr. Kelley expressed doubt that a normal civilization can be produced.

"If we do not choose to run some risk (of increased neuroticism)," he stated, "we must yield to the definite development of more frequent character disorders who will increase our delinquency and criminal rates."

"In the far future this may bring about a situation where a select group of unusually aggressive psychopaths ponder a final printed volume entitled, 'The Rise and Fall of Civilization.'"

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PSYCHOLOGY

Favors Stricter Rearing

► A CHANGE in America's child-rearing habits that might produce more neurotics but would cut down on juvenile delinquency and crime was advocated by a prominent police psychiatrist.

Dr. Douglas M. Kelley, professor of criminology at the University of California, who was the psychiatrist at the Nazi Nuremberg trials, gave his opinions at the meeting of the Texas Medical Association in Fort Worth.

Dr. Kelley said old-fashioned child-raising was strict and it taught self-control. Then along came Freud and his disciples who pointed out—correctly, Dr. Kelley admits—that this kind of training produced neu-

rotics. Discipline tended to scar the child's psyche.

With the increasing tendency to let children have their head with a minimum of parental discipline, immature childhood behavior has been more often perpetuated in later years. In the adult, infantile behavior is psychopathic and destructive. Hence there is more delinquency and crime.

The psychiatrist called for a search for a middle ground between the modern and old-fashioned views. He admits he does not have an easy formula. But he would favor coming closer to old-fashioned methods that teach self-control.

"We might produce more neurotics," he