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RADIATION BELT MAY MONITOR A-TESTS

By a Scientific Correspondent

The newly-discovered belt of intense radiation surrounding the earth in space, first detected by the American Explorer satellites, may provide a new method of detecting high-altitude nuclear explosions.

At one time experts feared that high-altitude tests would be impossible to detect from the ground. Dr. P. J. Kellogg, of the University of Minnesota, writing in NATURE, suggests that a high-altitude nuclear blast would affect the atomic particles trapped in the radiation belt in several different ways, all of them fairly easily detectable with existing methods.

The effects he anticipates range from auroral displays to a sudden escape of radiation from the belt into the upper atmosphere, through what might almost be described as a hole torn in the belt by the force of the explosion.

Dr. Kellogg's theory is partly based on observations made after two quite different types of high-altitude explosion, one using an atom bomb and the other using ordinary chemical explosive. They agree fairly closely with views held by scientists who have been working on somewhat similar lines at Bristol University.

Dr. Kellogg and the Bristol team both feel the next step should be a scientifically controlled high-altitude nuclear explosion to test the accuracy of their assumptions. Dr. Kellogg describes this as "quite crucial" to better understanding of the radiation belt.

In the same issue of NATURE, Dr. T. Gold, of Harvard University, puts forward a new theory to account for the existence of the radiation belt (which is still not properly accounted for).

The particles whirling around in the radiation belt leak steadily out of it -- so the belt must be continuously topped up from somewhere. Professor Gold thinks that the sun is the source of fresh particles.

From time to time, huge flares hurl out an intense flux of high-energy particles from the surface of the sun. But much smaller-scale versions of the same phenomenon seem to occur quite frequently -- possibly even continuously. These throw off particles that have not got the great energy of cosmic rays, but still travel far and fast enough away from the surface of the sun to get trapped in the earth's magnetic field. They then begin the complicated spiral dance observed in the radiation belt.