ASTRONOMY

# Cause of Twilight Glow

**That soft illumination of the sky in early morning and evening dusk is due to dust particles blown off of comets vaporized by sunlight.**

➤ THE TWILIGHT glow of early morning and evening is due to comet dust, Dr. Fred L. Whipple, Harvard astronomer, has reported to the Harvard Observatory's visiting committee.

The soft illumination of the planet path in the sky that the sun has just left is of interest to astronomers as well as poets and lovers. Known as the zodiacal light, it is caused, Dr. Whipple has concluded from theoretical studies, by a cloud of very small dust particles circling the sun in the plane of the earth's orbit. This dust cloud scatters the sunlight so that there is light even when the sun is no longer visible.

These particles of dust also scatter the light about the sun at the time of total solar eclipse and add to the beautiful pearly luminosity of the solar corona which is a striking spectacle of the sun's complete eclipse.

Actually these particles that cause this heavenly glow are small fragments from comets. They are composed of material blown off comets when their icy surfaces are vaporized by sunlight.

The dust particles shot away from the comets in this way slowly spiral into the sun under the influence of light pressure and the momentum of light.

One ton of such fine comet dust added to the cloud around the sun each second would be sufficient to keep the zodiacal light glowing indefinitely, Dr. Whipple's calculations show. Actually comets contribute some 30 tons per second.

The planet Jupiter, through its gravitational effect, keeps all but a small fraction of the cometary material from spiraling into the sun. Very few of the larger particles which range from pinhead to marble size contribute to the zodiacal light. Such debris of the solar system, that produce shooting stars or meteors when they plunge into the earth's atmosphere, have their orbits disturbed by Jupiter or this giant planet swallows up the sizable cometary particles before they have time to spiral into the sun.

The small bits of dust size can spiral more rapidly, Dr. Whipple finds, and thus evade the gravitational barrier set up by Jupiter.

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PHYSICS

# Simple Cloud Chamber

**You can see cosmic ray tracks with home made device made from two metal disks and glass cylinder with container of dry ice and tray of water.**

➤ NOW PEOPLE at home can actually see the tracks of the cosmic rays which are constantly bombarding every man, woman and child from outside our atmosphere. Atomic scientists at Brookhaven Laboratory, Upton, N. Y., have developed a cloud chamber which is not only simple enough to be built in the home but is also an improved research tool for the laboratory.

The new chamber was described by four Brookhaven scientists attending meetings of the American Physical Society in Chicago.

Cosmic rays are made up of atomic particles much too small actually to be seen. But as they dart through a saturated atmosphere in a cloud chamber they leave a trail of small droplets which are clearly visible, like the vapor trail left by high flying aircraft.

Earlier cloud chambers permitted seeing these tracks only for very brief periods of time. The new, simpler chamber manufactures a continuous vapor which means that scientists can view the tracks continuously. Thus they will be able to observe, without interruption, many interactions of atomic particles.

The essential ingredients are easy to get and easy to put together, the scientists said. Dry ice is placed in a flat container underneath a metal disk 5 to 17 inches in diameter. On the top surface of this disk is placed black velvet, to provide a background for viewing the tracks. A glass cylinder, slightly smaller in diameter than the disk and open at both ends, is placed on this disk. Felt soaked in methyl alcohol is fastened to the lower side of another metal disk which is then placed on the top of the glass. A tray of water at room temperature is placed on top of the upper disk. When a strong light—a powerful flashlight—is beamed on the velvet, the chamber becomes a showcase for many atomic events.

The new chamber was worked out by Drs. E. C. Fowler, D. H. Miller, R. P. Shutt and A. M. Thorndike of Brookhaven. It is an improvement of ideas already put forth in other laboratories.

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AERONAUTICS

## Urge Same Standards For All Airplanes

➤ IDENTICAL requirements for the approval of airplanes as airworthy on the part of the military and the Civil Aeronautics Administration are essential, particularly in times of emergency, the American Society of Mechanical Engineers was told.

The commercial cargo fleet could become immediately available for emergency military operations if the approval requirements were the same, Alan F. Kelsey, Boeing Aircraft Company, Seattle, told the engineers. The differences are not fundamental, he indicated, and if eliminated, planes could be transferred from one service to another merely by changing the insignia.

The lack of standardization in requirements increases the cost of aircraft for both the commercial operators and the government, he declared, pointing out some of the differences. The Air Force requires a fire extinguisher system in the engine nacelle, the CAA does not. The increased quantity of carbon dioxide for the purpose in the military craft requires a completely different system than in the commercial plane.

Another item preventing certification of military transport aircraft is the CAA requirement for a fuel dumping system, he continued. "If it is necessary for commercial transport aircraft, why not for military? Both carry passengers who are entitled to equivalent standards of safety. The aircraft manufacturer could produce better aircraft for less money if differences in opinion such as these were resolved."

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## On This Week's Cover

➤ THE FILAMENTS of a radio tube vibrating at extremely high frequency and other motion recurring as often as 300,000 times per second can be "frozen" either visually or photographically by a new type of stroboscope shown on the cover of this week's SCIENCE NEWS LETTER.

The new device, developed by the Naval Ordnance Laboratory at White Oak, Md., depends on the use of an electron tube similar to the snooperscope tube which, during the war, enabled sharpshooters to spot their targets at night.

Unlike the conventional high speed photography, the new NOL stroboscope can be used in normal lighting.

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