

## ASTROPHYSICS

# Quasars May Be Illusion

The puzzling objects called quasars, thought to generate huge amounts of energy, may actually be optical illusions caused by an intermediary lens-like galaxy.

► THE PUZZLING celestial objects called quasars, which look like stars but are thought to generate fantastic amounts of energy, may actually be optical illusions caused by a gravitational lens formed in far-distant space.

The magnetic field of the giant grouping of a billion or so stars known as a galaxy acts as a lens, deflecting light passing near it from more distant objects, which could result in the optical illusion.

Dr. J. M. Barnothy of the Biomagnetic Research Foundation, Evanston, Ill., has suggested that such a gravitational lens could make the light from galaxies whose cores are violently exploding resemble that of quasars. The lens is "very effective" as an image intensifier, Dr. Barnothy told the American Astronomical Society meeting in Ann Arbor, Mich.

The light from Seyfert galaxies, which have very bright cores undergoing violent explosions, would give a "spectacular" effect when deflected by a large elliptical galaxy.

This combination, Dr. Barnothy has calculated, produces images that are "in every respect similar to those of quasars."

The optical illusion theory accounts for most of the observed properties of quasars, including their starlike appearance, the

large red shifts in their light, extreme absolute luminosity, high intensity in the ultra-violet, irregular brightness variations and strong radio emission.

Even if quasars are optical illusions, Dr. Barnothy noted, they are powerful tools for deciding between competing models of the universe.

He has calculated the number of quasars that should be visible for two steady-state versions of cosmology and one evolutionary model.

In the steady-state theory, matter is continuously created in empty space from nothing. The evolutionary universe is an expanding model that started from an explosion several billion years ago.

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## GEOPHYSICS

## Rockets Are Flytrapping Tiny Micrometeorites

► THIS SUMMER the United States and five other countries, Australia, France, Germany, Israel and Sweden, are trapping micrometeorites at the edge of space more than 45 miles above earth. The meteorite traps, called Venus Flytraps from the insect-trapping flower of that name, are boosted

into space from the Churchill Research Ranch in Manitoba, Canada, in the nose cones of Aerobee high-altitude-sounding rockets.

As each of the five Aerobees in this study roars out of its launching tower the Venus Flytrap is sheathed in its nose cone like the bud of a flower. This prevents it from collecting earthly dust at lower altitudes. As the rocket nears its peak the cone opens like a blossoming flower, exposing 500 feet of meteor-collecting surface.

While the rocket coasts on up to 100 miles above earth, one after another of the collecting trays is exposed. In this way scientists can tell the altitudes at which various amounts and types of meteorites are collected.

Three types of surfaces are used in the collection trays: aluminum-coated lucite, which will be examined by electron microscopes to determine size, number and distribution of the smaller particles; lucite which will be viewed with optical microscopes to reveal the size and distribution of meteorites larger than two microns (.00007874 inch); and polished aluminum which will be probed with X-rays to determine the composition of the particles.

As the rocket drops back past 65 miles altitude, the meteorite collector folds back into the nose cone like a flower folding up for the night. Thus sheathed, the micrometeorites will be unspoiled by earth's atmosphere and the heat of reentry.

The number and size of these micrometeorites will give a clue as to the probable frequency of larger meteors, and the protection necessary for manned spacecraft.

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## GEOPHYSICS

## Meteoroids in Space 'Not Unduly Hazardous'

► THE CREWS of future earth-orbiting space stations, who will certainly have enough problems to keep them busy, at least will not have to worry very much about being hit by meteoroids.

Data from the huge, winged Pegasus I and II satellites, Explorer XXIII and Explorer XVI have been correlated by the National Aeronautics and Space Administration and they indicate meteoroids probably will not be "unduly hazardous" to life in orbit.

This is what astronomers had already predicted from ground-based observations, but it remained for the satellites to provide first-hand information. There are currently four of them actively keeping count. Explorer XVI stopped working in 1963 but a third Pegasus was launched July 30.

What the satellites are measuring is the meteoroid flux—how many will puncture a given thickness of metal in a given time.

Knowledge of meteoroid danger is vitally important for spacecraft and orbiting stations since the number and size of meteoroids largely determine the amount of shielding necessary, which can make a vital difference of several tons in the weight of the vehicle.

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NASA

**GEMINI TEST**—Astronauts L. Gordon Cooper Jr., command pilot and Charles Conrad Jr., co-pilot for the National Aeronautics and Space Administration's Gemini 5 mission, practice emergency exit from the spacecraft during a simulated test flight at Cape Kennedy, Fla.