ASTRONOMY

Earth's Natural Satellites

Cloud-like, they can only be seen under favorable circumstances. They were photographed as faintly luminous patches for the first time in March.

➤ EARTH has two natural, cloud-like satellites. They travel in nearly circular paths at the same distance as the moon.

The two cloud-like satellites can be seen as faintly luminous patches with the unaided eye under exceptionally favorable circumstances. They are believed to be a swarm of tiny particles, or meteors.

The objects were found by Dr. K. Kordylewski of Krakow Observatory, Poland, who started searching for them telescopically ten years ago. Although the clouds travel in the same path as the moon, they are about 60 degrees behind it.

A special combination of circumstances is needed to make the clouds observable. Because they shine by reflected sunlight, as does the moon, they will be brightest when nearly opposite the sun. However, at such times, the moon is approaching full, so sightings are possible only when the moon is below the horizon.

At the same time the position of the 60-degree lag in their orbital path must be at a considerable altitude, in order to lessen dimming of the objects' light due to passage through extra layers of the earth's atmosphere. The position must also lie clear of the faint light of the Milky Way as well as the so-called counterglow, or gegenschein.

The rarity with which this set of conditions is met helps explain why the clouds have not been seen previously.

Dr. Kordylewski's efforts to photograph the earth's cloud-like satellites were unsuccessful until this spring, when he recorded them on March 6 and April 6 using an f/1.5 camera of 50 millimeter focus, after taking special precautions.

A new search with very large telescopes might show individual meteors in the clouds, Dr. Kordylewski reports in Sky and Telescope, 22:63, 1961, a journal for astronomers published at Harvard College Observatory. Amateurs could also make naked eye observations.

• Science News Letter, 80:82 August 5, 1961

METEOROLOGY

Plan Atmosphere Study

➤ WHILE scientists aim for the outer reaches of space and explore the oceans and continents, other U. S. scientists are now quietly drawing up plans for a ten-year program to probe the earth's atmosphere.

Following in the footsteps of other similar programs in oceanography, space and geophysics, the atmospheric program will cover a wide range of activities, from the effects of atomic fallout to the control of hurricanes and tornadoes.

"The plan will be ready early this fall," Dr. Sverre Petterssen, University of Chicago professor who is in charge of the group of scientists planning the program, told SCIENCE SERVICE in a telephone interview.

In the past, efforts in meteorology have lagged far behind the other sciences, Dr. Petterssen said. With the mass of new data from rockets and satellites flooding the data centers, a long-awaited coordinated attack on the entire atmosphere is needed.

About 150 scientists, including many foreign scientists, met at the American Meteorological Society building in Boston to discuss the program. More conferences will probably follow before a definite program is set up.

"Although scientific efforts in general will be doubled in the next ten years, the atmospheric sciences must do more than this average to make up for past neglect," Dr. Petterssen emphasized. Some of the more important problems include atmospheric research in arid underdeveloped regions, the effect of atmospheric circulation on dwindling water resources, and the effect of a changing environment on animals and insects.

The atmosphere is a huge envelope of air surrounding the earth up to altitudes of more than 500 miles. In its lower layers, tornadoes and hurricanes are born; in its upper layers, the sun's rays are trapped and short-wave radio signals are reflected.

The scientists are members of the National Academy of Sciences' "planning task force," making plans at the request of President Kennedy's special assistant for science and technology, Dr. Jerome Wiesner, to set up a national program in the atmospheric sciences.

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SPACE

Suborbital Space Hops Not Routine Yet

➤ SUBORBITAL space hops will not become routine for a long time—a man's life is at stake.

Yet some day suborbital flights will be as routine as test flights of experimental aircraft are today.

The National Aeronautics and Space Administration told SCIENCE SERVICE that Air Force Capt. Virgil I. Grissom, the second U. S. astronaut who flew to a height of 118 miles on his 305-mile trip down range from Cape Canaveral, was better protected than many test pilots of new aircraft.

It is almost inconceivable that anything can happen to the astronaut on the suborbital trips. The escape rocket on the Redstone, which carried Capt. Grissom's Liberty Bell 7 capsule, is a better safeguard than the ejectable cockpit in many experimental planes.

It is possible that unforeseen occurrences could endanger the astronaut on orbital flights or in space, but on suborbital flights the possibility for only a partly successful mission, such as the loss of the Liberty Bell which sank in the Atlantic after Grissom's rescue, is greater than that the astronaut would get hurt.

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AERONAUTICS

Big Planes' Vapor Trails A Threat to Small Planes

➤ LIGHT AIRPLANES flying in the wake of heavy transports can be subjected to stresses that often exceed design limitations, a research project conducted at Langley Field, Va., shows.

The lighter craft run into vortex trails from the transports' wingtips. These trailing vortices—sucking whirlpools of air that "roll up" behind the heavier planes—can maintain their original strength for as long as a minute or more in very calm air.

Since the trails are invisible, there is little that the pilot of the lighter plane can do except stay alert on calm days in high-intensity traffic areas—whether or not another airplane is in sight.

"Reducing speed or flying either above or below the path of an airplane should reduce the magnitude of the load factors," the National Aeronautics and Space Administration reports.

Since most of these encounters are unexpected, trying to turn the smaller plane aside after flying into the vortices "may cause greater peak load factors than if the elevators were held fixed," NASA investigators found.

Calculations were based on the operational characteristics of a 2,000-pound single-engine light airplane and a light transport, as "penetrating" craft, and a heavy military transport, a swept-wing civil transport, and a proposed supersonic transport, as the "vortex-generating" craft. Simulated flight conditions involved the time shortly before landing or take-off, since the problem is most acute near airfields with a high volume of traffic.

For light airplanes, load factors exceeded design potential "by a comparatively large amount" in the wake of the heavy supersonic plane, NASA said. The loads are expected to become increasingly severe because of the current trend toward heavy supersonic transports with short wing spans.

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By cooling human blood as low as 50 degrees Fahrenheit, U. S. surgeons can operate on motionless *hearts* for more than an hour.