

## ASTRONOMY

# Plan Satellite-Telescope

**A two-ton satellite with a 36-inch telescope will be launched within the next few years for star tracking. It should operate for at least one year without equipment failure.**

UNITED STATES PLANS for observing the moon, planets, sun and the entire universe beyond the solar system from earth-circling satellites have been reported.

Dr. Nancy G. Roman of the National Aeronautics and Space Administration, Washington, said a "major undertaking" will be the launching, within a few years, of a two-ton satellite with an optical telescope 36 inches in diameter, capable of tracking stars very accurately. In the relatively near future, she told the American Astronomical Society meeting in Cleveland, U. S. space scientists plan to obtain a good lunar map.

The director of Princeton University Observatory, Dr. Lyman Spitzer Jr., outlined the problems of operating a large telescope in a satellite orbit. He said the problems of launching, communication and remote control are common to all satellites.

A large astronomical telescope in a satellite, however, must also be capable of being set with pinpoint accuracy at any desired region of the sky, despite sharp temperature changes produced when the satellite enters the earth's shadow and then re-emerges into full sunlight.

Dr. Spitzer also pointed out that an unmanned observatory should operate for at

least a year before equipment fails. He said the equipment being studied by the Princeton group includes a quartz telescope mirror 24 inches in diameter to be used for analyzing the ultraviolet starlight that does not penetrate through the earth's atmosphere.

For temperature control, a two-chamber satellite is planned. The telescope would be rotated by electromagnetic forces acting on an "inertial sphere," a hollow aluminum ball 16 inches in diameter suspended in space by a magnetic field and rotating without any friction. By the principle of reaction, he explained, when the sphere is rotated one way, the telescope rotates the other way.

The side of the satellite warmed by sunlight could contain most of the electronic equipment, tape recorder and a transmitter. The other side, insulated to a cool minus 100 degrees Fahrenheit, would contain the telescope, spectroscope and photoelectric detectors that operate most effectively at low temperatures.

The general direction in which the telescope points would be determined by measurements of the light from the sun and of the earth's heat radiation. To obtain the required accuracy in aiming the telescope,

television pictures of the sky, relayed to ground observers, could be used.

Dr. Herbert Friedman of the U. S. Naval Research Laboratory, Washington, said past rocket and satellite information indicate it will be "extremely important" in future astronomical experiments to introduce some way of eliminating the effects on instruments of particles in the earth's natural radiation belts, which are believed a hazard to future space travelers.

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## ORNITHOLOGY

## Transplanted African Bird Mates in Winter

TAKE A WEAVER FINCH from his home in Africa, bring him to Iowa and you will find he starts his love-making preparations some six months later than American birds.

Fall and winter, not spring, is the nuptial season for the African birds, two zoologists reported to the American Association for the Advancement of Science meeting in Chicago.

Male birds acquire their brilliant cock plumages in the fall season. Size of the sex gland and breeding activity reach a maximum about September, with the mating season sometimes extending through December.

Evidently the harmony between seasonal changes in molts, plumages, and primary sex characters is brought about by glandular control, Drs. J. P. Thapliyal and Emil Witschi of the State University of Iowa reported. In the caged African birds, their hypophysis gland or pituitary body, is slowly stimulated by long summer days until enough hormone is released to stimulate initial growth of the sex glands. However, the researchers pointed out that maximum sex development follows only as day length decreases.

These birds have now become "laboratory animals," serving in the analysis of normal and pathological hormonal conditions, Drs. Thapliyal and Witschi explained. The intricate pattern of complex hormonal interactions is mirrored spectacularly in their external appearance.

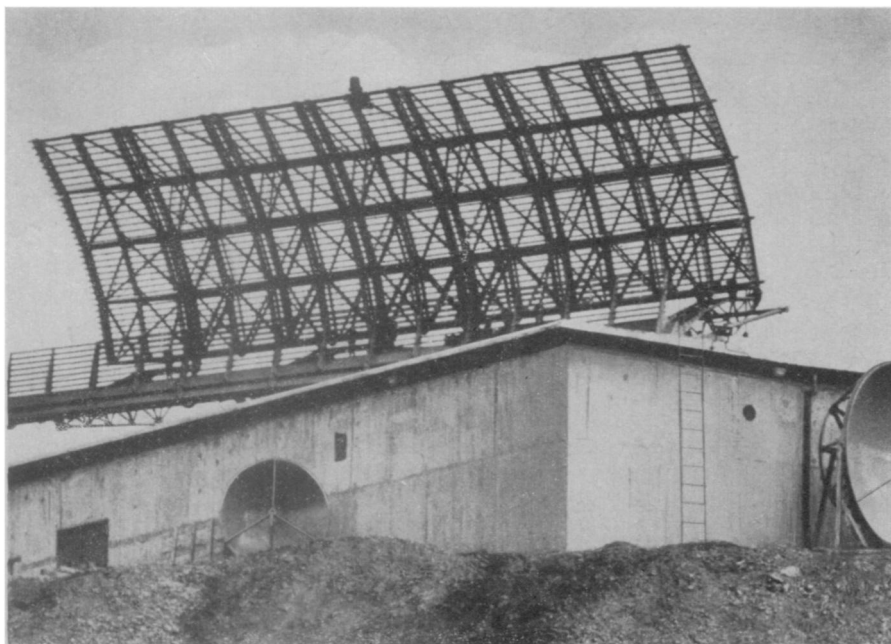
## Constant Mates for Life

DIVORCE RATE among the chimney swifts appears to be very low.

Some 150 birds that had been banded were studied for more than ten years, Dr. Ralph W. Dexter of Kent State University told scientists at the Association meeting. The majority of the chimney swifts had only one or, at the most, two mates for life. Nesting records range up to 13 years, he said.

Few birds change mates each year or two, Dr. Dexter explained. Several swifts remated with their former mates after nesting with another bird in the interval. Only three birds had two mates in one season. A few birds shift about from one possible mate to another before nesting for the season.

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**HIGH POWER RADAR**—A high power (500 kilowatt), 50-centimeter radar installation has been officially opened at the Wellington, New Zealand, airport. Two microwave "dish" aeriels are seen at the base of the building. Received radar signals are also sent by microwave radio link to the airport and by a separate radio path to the airways control center for display on the radar screens.