

The Orbiting Astronomical Observatories (OAO's) will represent just about the greatest advance in astronomy since the star. From Galileo's first experiments to the 200-inch giant on Palomar Mountain and including even the huge radio-telescopes in the United States and Great Britain, all of man's observations have been limited by the all-pervading blanket of the atmosphere.

It is the atmosphere that causes stars to "twinkle." It is the atmosphere that prevents all but a few wavelengths of light from ever reaching man's telescopes at all. As long as the astronomer has the atmosphere between himself and the stars he is as limited as the marine biologist trying to examine the ocean floor without leaving his boat.

OAO-A, presently planned for launching late in 1965, will not take the astronomer anywhere, but it will take his telescopes.

Grumman Aircraft Engineering Corporation is building the eight-sided 3,600-pound aluminum satellite to carry 11 small telescopes out beyond all but the extreme fringes of the atmosphere. The telescopes will relay television pictures of ultraviolet light from the stars back to earth.

Because of the interfering atmosphere, no ultraviolet light from the stars reaches the earth. Scientists, therefore, have obtained ultraviolet spectra from only seven stars, using instruments mounted in high-altitude rockets. The OAO's should provide spectra from as many as 14,000 stars a year.

OAO-B will be equipped with a single 36-inch telescope that can "see" a wider range of wavelengths than just ultraviolet. From its "exalted" position, the telescope will be able to pick out stars more than 100 times fainter than those visible to the Palomar reflector. Whole galaxies may suddenly appear where none had been known before.

### Things to Come

Of the other OAO designs that are at present being worked on, perhaps the most extraordinary is a 2000-foot radio-telescope, to orbit some 6,000 miles above the earth. The proposed satellite would have four 1000-foot arms, forming a giant "X." It might conceivably be orbited as early as 1967.

Further in the future is a manned 100-inch telescope in which the man would serve not as an astronomer, but as a repairman-technician. In fact, he would not even be around while observations were going on, since his slightest movement could jar the delicately-balanced instrument out of kilter. His job would be to collect photographic plates, make repairs, and change auxiliary equipment so that different kinds of measurements could be made.

All is not in the distant future, however. Observations have already been made by various satellites, similar to those planned for the OO's. A series of studies of X-ray emissions in space set radio and optical astronomers working together, comparing notes on sources of visible and invisible radiation.

The distances between land masses on the earth are even today being measured by satellite triangulation, or geodesy. These projects will soon be combined with information from the OO's, to give a more com-

plete picture of the shape of the earth, as well as its size, gravitational field and climate.

Despite their alphabet-soup names, the orbiting observatories will be the most useful tools man has yet devised to aid him in his peerings, peekings and pryings at outer space—and earth.

• Science News Letter, 87:10 January 2, 1965

### GENERAL SCIENCE

## Award for Understanding Meaning of Science

► THE MOST OUTSTANDING contribution to "the understanding of the meaning of science to contemporary man" will receive a new \$25,000 gold medal award from the Pacific Science Center Foundation, which occupies the U.S. science exhibit building of the Seattle World's Fair. The Arches of Science Award is funded by Pacific Northwest Bell Telephone Company.

• Science News Letter, 87:11 January 2, 1965

## Nature Note

### White Birch

► AS THE DARK SKY of winter overhangs the drab hills and forests of a chill world, the gleaming white trunks of birch trees stand out in graceful beauty.

This eerie radiant whiteness, contrasting to the blacks and greys of the oak, elms and other trees, is caused by a reflecting and scattering of light in all directions from the many microscopic air spaces in the outer layers of bark. This is the same phenomenon that makes snow white.

This white birch, *Betula papyfera*, also called the canoe birch or paper birch, was used in many ways by the Indians before the arrival of settlers from Europe. The bark of the tree is strong, light and repels water. The Indians selected certain trees from which they carefully stripped pieces of bark, flattened them over a fire and formed their canoes. The bark of the birch was also used to cover and waterproof their tepees and to make baskets and other containers.

The fun of stripping off the bark, exposing the beautiful orange-red or pink lining, is often too tempting to children—and too destructive to the trees. For the bark, lined with horizontal black lenticels or breathing pores, is the protective skin of the tree. New white bark can never grow back to cover the ugly scar where it has been stripped. If the bark is stripped all around the trunk of the tree, the tree will die, for the sap, the tree's life fluid, cannot cross the gap.

Of the 30 species of birch found throughout the world, the white birch is the most widely distributed. It likes the cold climate of the northern woods, and is found in northern America from the Atlantic to the Pacific. It is a hardy tree, the tough corky bark acting as insulation to protect the more delicate living cells beneath. The trunk and limbs are very tough and elastic, easily handling the icy blasts of winter winds.

• Science News Letter, 87:11 January 2, 1965

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