ASTRONOMY

New Flaming Super-Nova; Second Within Fortnight

The Seventeenth That Astronomers Have Ever Known, Brilliant "New Star" is Too Distant for Unaided Eye

A SECOND super-nova five hundred million times as bright as the sun is announced by Dr. Fritz Zwicky of the California Institute of Technology. (See SNL, Sept. 11).

Discovered on a photograph taken at Palomar Mountain on Sept. 10, the new super-nova, like that found on August 29, is in a remote extragalactic system, in this instance NGC 1003 in the constellation of Perseus, at a distance of at least seven million light years.

In spite of its enormous luminosity, the super-nova is so distant that it appears as only a faint telescopic star of magnitude 10.5. The date of its outburst is unknown.

Photographs of the spectrum of the new star, taken at the Mount Wilson Observatory of the Carnegie Institution of Washington by Milton Humason on Sept. 12, show the broad bands characteristic of super-novae. Further confirmation of the remarkable character of the star was obtained by Dr. Walter Baade of the Mount Wilson Observatory staff. Dr. Baade, by determining the distance of the spiral system of stars within which it occurs, found that the intrinsic brightness of the super-nova, at the lowest estimate, is absolute magnitude minus 16.2, or about ten times that of all the rest of the stars in the spiral system of which it is a member.

Too Far Away

The suggestion made by Dr. Baade and Dr. Zwicky in 1934, that the explosive outbursts of super-novae may possibly play a part in producing cosmic rays, probably cannot be tested in the case of either of the two super-novae. Their distances are too great for any noteworthy effect to be expected.

Nevertheless, observers of cosmic rays will carefully examine their records covering the appearance of these new stars, since the nature and amount of any possible effect is still uncertain.

The discovery of the new super-nova was made through use of the 18-inch Schmidt telescope, a small instrument with a wide and roving eye. Perched on Mt. Palomar in southern California, it is a sort of pilot for the giant 200-inch telescope now building which in a few years will see deeper into space than any other aid to human vision.

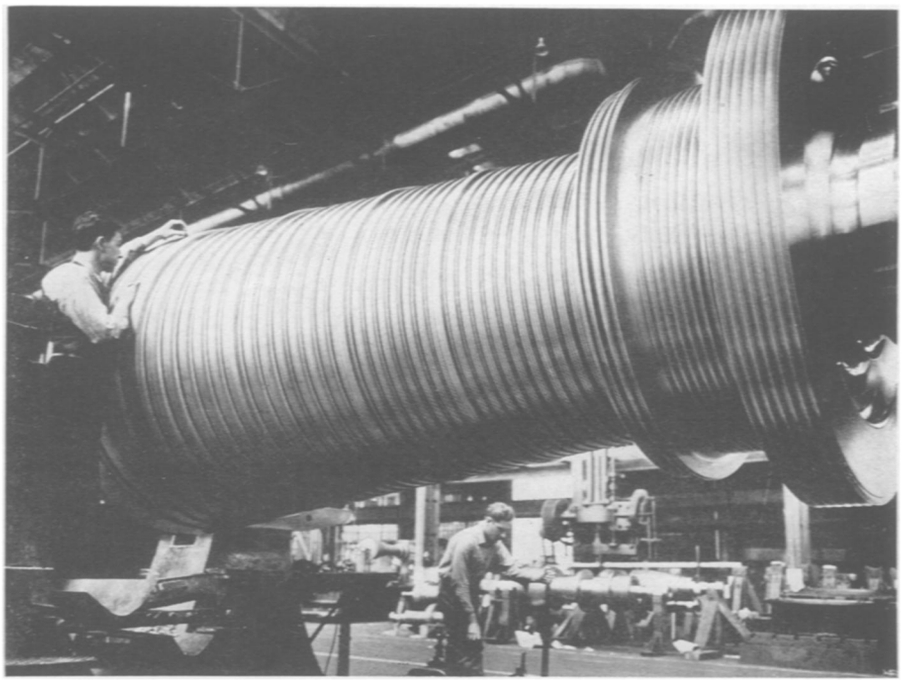
By discovering two super-novae, the 16th and 17th the world of astronomy has known, within a fortnight, this Schmidt telescope in the hands of Dr. Zwicky has become a famous instrument. It promises to make many more discoveries.

In its work of discovery, the Schmidt instrument is teamed with the famous 100-inch telescope of the Carnegie Institution's Mt. Wilson Observatory near Pasadena. The Schmidt instrument scans the sky for interesting events. It covers a portion of the sky many hundreds of times larger than does a large reflecting instrument and many pictures can be made in a single clear night. It is also less sensitive to atmospheric disturbances.

Once the discovery is made by means of the Schmidt instrument, then the heavier astronomical artillery comes into action. The great 100-inch telescopes and lesser mirrors make detailed studies. This was the course of discovery in the case of the two distant, flaming "new" stars that have exploded with such brilliance that they are to astronomers today's most intriguing objects in the sky.

Famous among the rare super-novae of the past is Tycho's star, which appeared in November 1572 and was for some days visible in daylight and brighter than Venus at her best. Another temporary star, observed by Kepler in 1604, was as bright as Jupiter and remained visible for two years. These were much closer to the earth than the super-novae just discovered by Dr. Zwicky and were therefore seen by the unaided eye.

More frequent are temporary or "new" stars giving out less light. These ordinary novae are not in the same class with the super-novae. But they attract much attention, both on the part of lay observers of the stars and the astrono-



FOR STEAM "WINDMILL"

Ready to be "bladed" is the above 50-ton piece of steel built to serve as the hub for a giant steam turbine in Kansas City, Kansas. One of the heaviest single-piece rotors ever cast, hundreds of blades for the turbine will be set around its outside along the grooves visible in the photograph. Westinghouse is the builder, East Pittsburgh, Pa. the location of the factory.