THE 1959 PALOMAR SUPERNOVA SEARCH

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During the past year, four certain and two probable supernovae were found on photographs obtained with the Palomar Schmidt telescopes. The two probable objects, Nos. 5 and 6 in Table I, appeared on 48-inch plates taken in 1958. In both cases

TABLE I

SUPERNOVAE FOUND IN 1959

No.	Galaxy	m_{neb}	Type	α (1950)	δ	Supernova First Obs.	Supernova m_{pg}	Cl. Member
1	NGC 1350	11.8	SBc	$3^h29^m.1$	−33°48′	Jan. 6, 1959	16.0*	Fornax
2	NGC 4921	14.5*	SBc	12 59.2	+28 7	May 4, 1959	18.5*	Coma
3	Anon.	16.0*	SBc	13 9.0	+ 3 41	June 28, 1959	14.0*	Virgo?
4	NGC 7331	11.2	Sb	22 34.8	+34 10	June 28, 1959	13.0*	
5	Anon.	16.0*	Sb	3 17.4	+42 37	Feb. 10, 1958	17.5*	Perseus?
6	NGC 5082	15.0*	Sb	13 17.8	−43 28	June 13, 1958	16.0*	

* Estimated values.

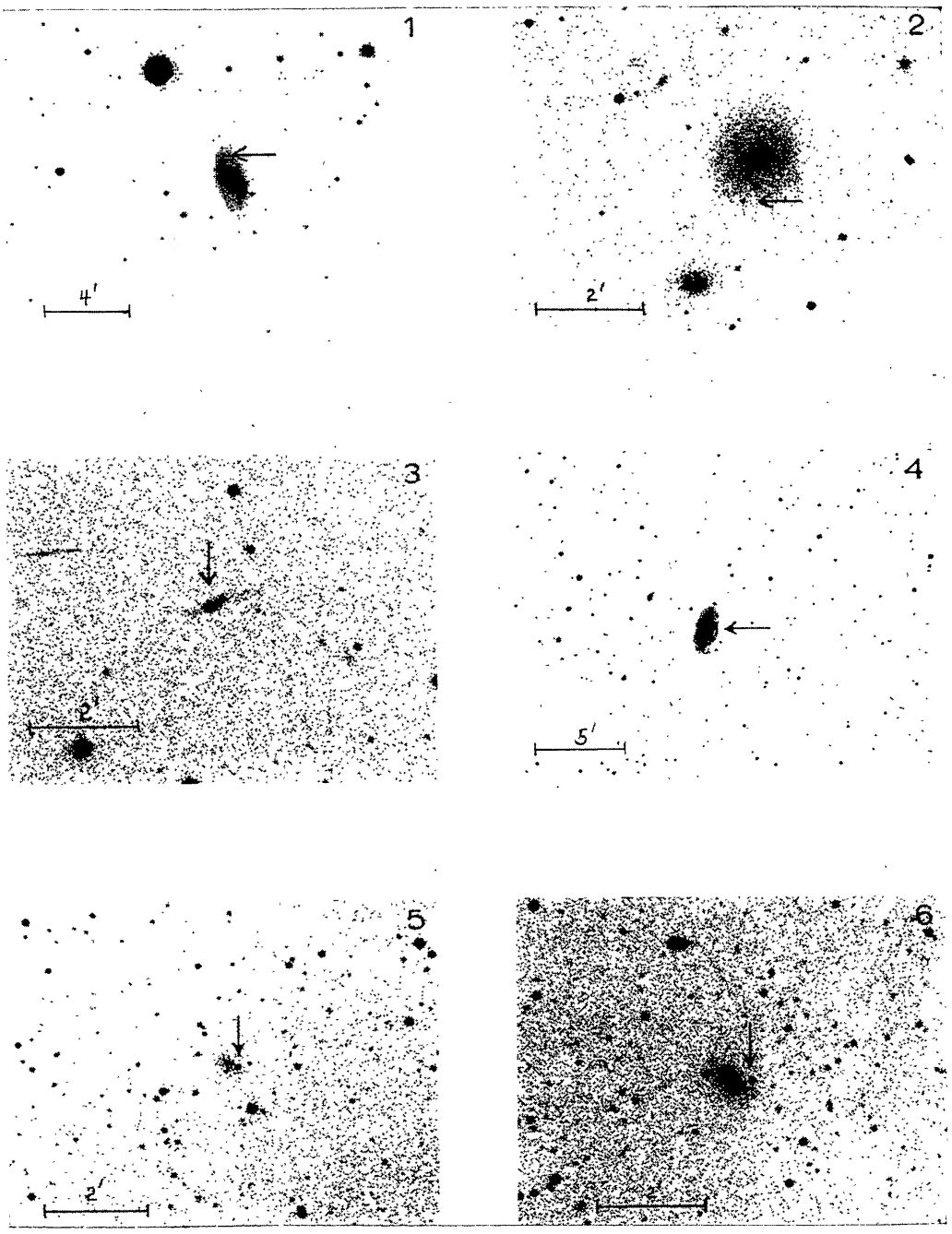
Redshifts: NGC 1350, +1780 km/sec, Zwicky-Humason unpublished.
NGC 4921, +5459 km/sec, Mayall, Lick.
NGC 7331, +780 km/sec, Humason.

only single plates of the fields in which they were situated were available. By 1959, when second plates of the fields were obtained, both objects had become too faint to photograph. Although unconfirmed, they are assumed to be supernovae as they were within the respective galactic boundaries and their photographic images seem real. Supernova No. 5 appeared in a small faint galaxy about 1° north of the center of the Perseus cluster of galaxies. No. 6 appeared in a faint galaxy $4^m.5$ west and 43′ south of the well-known bright galaxy and radio source, NGC 5128.

Supernova No. 1 is the only object in the list found on 18-inch Schmidt photographs. It and supernova No. 5 were found by Gates. Nos. 2, 3, 4, and 6 were found by Humason.

The spectra of supernovae Nos. 3 and 4 were observed by Greenstein with the 200-inch. He reports that the spectrum of No. 3 was that of a type I supernova, and that the spectrum of No. 4 was of type II. Supernova No. 4 could not be clearly as-

PLATE I



PHOTOGRAPHS OF SUPERNOVAE FOUND IN 1959

No. 1. 200-inch Hale photograph.
Nos. 2, 3, 5, 6. 48-inch Schmidt photographs.
No. 4. Polaroid print from a 48-inch Schmidt photograph.
Orientation: North at the top, west to the right.

signed to type II on the first plates obtained, but on later spectrograms it could definitely be classified as of type II. Greenstein suggests that when the early plates were obtained the supernova may have been at an unusual stage of development.

Photoelectric measures of the two brightest supernovae have been made at the 200-inch by Arp and Sandage, and a number of photometric plates of objects Nos. 2, 3, and 4 were obtained at the 48-inch by Plaut, Perek, Herzog, Abel, Kearns, and Humason.

During the year, some 4000 galaxies in 64 fields were kept under observation with the 48-inch Schmidt. The frequency of observation of each field varied from two to three for fields at low southern declinations to five or more for fields at favorable declinations.

Observations with the 18-inch Schmidt were considerably reduced during 1959 as the telescope was out of commission for about eight months for a general overhauling and partial revision of the optical system.

The Palomar supernova search is a part of a cooperative international effort and is directed by Fritz Zwicky. At the present time, three observatories are participating in the search: the Steward Observatory in Tucson, Arizona, the Berne Observatory in Switzerland, and the Mount Wilson and Palomar Observatories. The project is partially financed by funds from the National Science Foundation and the Swiss National Science Fund.

ON SHAPLEY'S DETERMINATION OF THE CEPHEID ZERO POINT

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Since Baade's demonstration of the necessity for a revision of the zero point of the cepheid period-luminosity relation,[1] this matter has been the subject of much further study. Estimates by

* Now at the Geophysics Corporation of America, Boston, Massachusetts.