

COMET NOTES

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Comet 1961 *f*, the third new comet of 1961, was discovered by T. Seki, Kochi, Japan, on October 10 as an eighth-magnitude object about 5° west of β Leonis. Confirmation was made by M. Honda, Kurashiki, on October 11. The new comet was widely observed during late October and most of November as it brightened to naked-eye visibility. The motion at the time of discovery was extremely small for so bright a comet, amounting to less than $20'$ /day, and one immediately suspected that most of the motion was in the line of sight. An orbit, computed by L. E. Cunningham as soon as positions became available, showed that the suspicion was correct, the comet in mid-October moving almost directly toward the earth in an orbit inclined nearly 156° to the plane of the ecliptic. Perihelion passage took place on the day of discovery, October 10, at a distance from the sun of 0.68 a.u. The comet passed the earth at a distance of only 0.1 a.u. on November 15, accounting for the increase in the apparent brightness.

Because of the close approach to the earth, considerable interest in Comet Seki developed among radio astronomers, who attempted both radio and radar observations. At the date of this writing, analysis of the results was awaiting availability of an improved orbit and precise ephemeris that would represent astrometric observations made during the time of the close approach.

As the comet approached the earth in early November, the apparent motion was accelerated rapidly southwestward, and the comet moved within ten days from a position on the ecliptic some 15° east and south of Regulus to the Large Magellanic Cloud. By the end of November the comet was again under observation from the northern hemisphere, appearing by then as a considerably fainter early evening object.

Comet Seki, especially when close to the earth, was a rather diffuse, poorly condensed object, the nuclear condensation contributing only a small amount to the total brightness. For example, the total brightness of the comet was 5.3, as estimated on

November 11 with 7×35 binoculars at the Flagstaff Station of the U.S. Naval Observatory. At the same time, short-exposure photographs with the 40-inch reflector showed a weakly condensed image of magnitude about 15.5, while a 10-minute exposure showed a head at least 4' in diameter and a weak, rayed tail extending 22' to the edge of the plate. No sharp nucleus was seen on careful visual examination of the comet with the 40-inch reflector. The distance of the comet from the earth was less than 0.18 a.u. at the time of these observations. Comet Seki is expected to fade very rapidly with increasing distance from the sun and from the earth, and it is extremely unlikely that any observations will be made after mid-January, with even the largest instruments.

Periodic comet Grigg-Skjellerup was recovered November 9.8 UT by K. Tomita, Tokyo, as a diffuse object of 18th magnitude in the pre-dawn sky in Corvus. The observed position was in almost precise agreement with the very similar predictions by G. Sitarski, by B. G. Marsden, and by C. Dinwoodie and M. P. Candy. It is interesting to note that Tomita was responsible for the recovery of this comet at its preceding return also, when he observed it first on December 29, 1956. A single plate of the comet was obtained at the Naval Observatory on November 10.5, and an approximate position was measured before Tomita's announcement was received from Copenhagen. No announcement was transmitted, however, because of lack of a confirming observation. By November 18 the comet had brightened to magnitude 17.0, the very sharp, stellar condensation appearing in a faint trace of coma. The comet was looked for but not recognized with the 40-inch reflector.

Comet Grigg-Skjellerup, 1961 *g*, is expected to reach its greatest brightness, probably 14th magnitude, at the end of December, coincident with perihelion passage on December 31. The comet will remain close to the sun in the morning sky, however, and probably will be lost in the twilight during January.

Periodic comet Perrine was photographed with the 40-inch reflector at Flagstaff on November 29 as a well-condensed object of magnitude 19.8 and confirmed on December 2. The observed positions indicated a correction of about +1.3 days to the time of

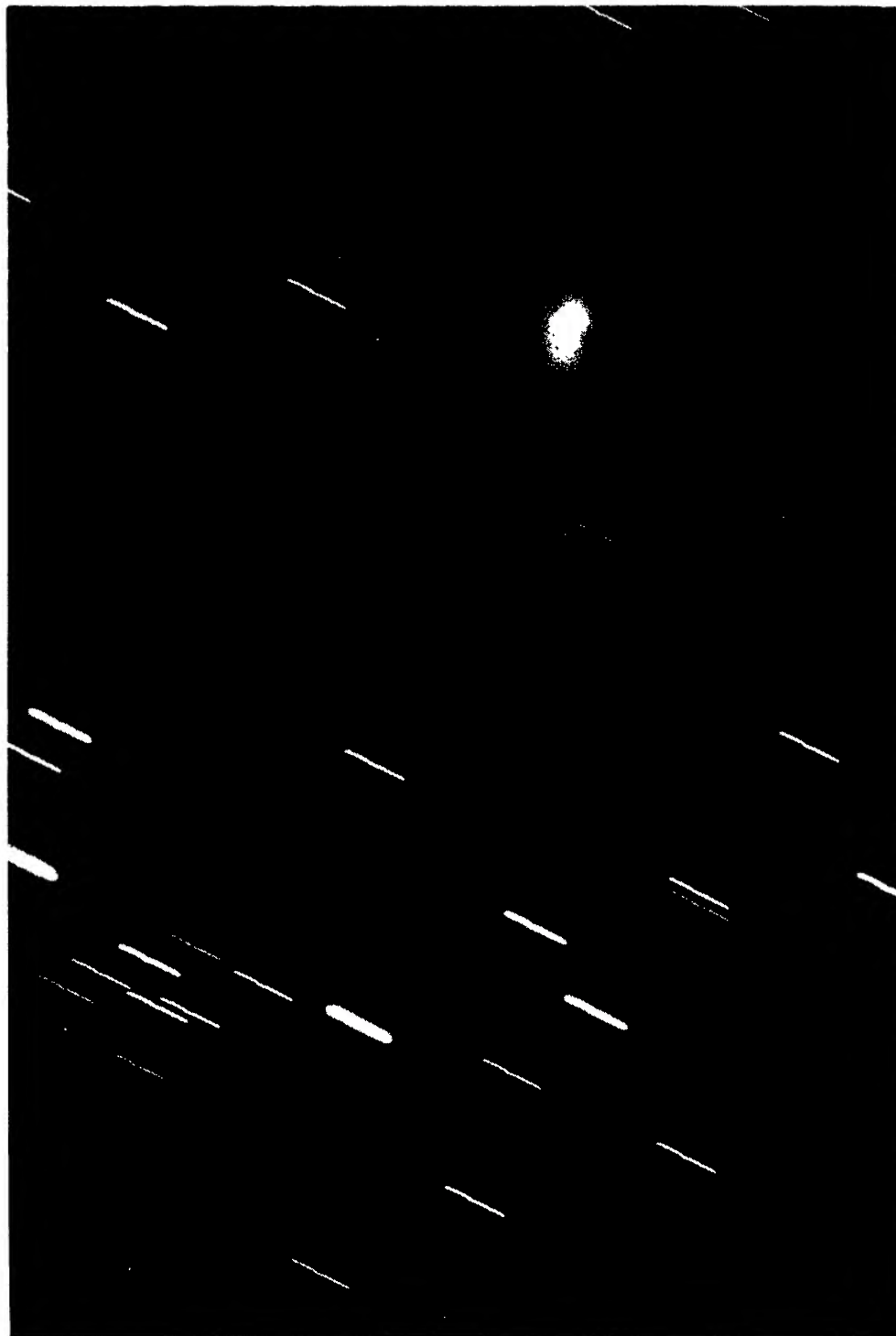
perihelion predicted by W. H. Julian and P. Egerton, or -0.9 day to that predicted by R. Szafraniec. Both predictions suggest a brightness six or seven magnitudes greater than that observed, but the adopted magnitude laws were based on visual observations near perihelion passage, when the comet usually is fairly bright. The observed magnitude was, however, in excellent agreement with that expected by the writer on the basis of photographic observations with similar equipment at the return of the comet in 1955.

Comet Humason, 1961 *e*, which continued to be under observation during October and November, showed evidence of physical activity rather unusual for a comet so distant from the sun (more than 4.5 a.u.). On October 2 structure in the coma surrounding the strong nuclear condensation gave the comet the appearance of a crab on a 60-minute exposure with the 40-inch reflector. By October 4 the appearance was even more remarkable. As can be seen in Plate I, the most prominent feature then was a highly contorted tail that extended 15' from the nucleus into the S-SE sector. Exposures taken later in the month showed gradually diminishing activity, but by November 12 Comet Humason had a prominent trifurcated tail extending some 5' nearly directly east. It will be interesting to watch this comet closely for further activity during the coming months. Conjunction with the sun will occur at the end of the winter, forcing suspension of observations for a time. The comet will continue to move south after conjunction, and observers in the southern hemisphere will be specially favored at the time of perihelion passage in December 1962.

Comet Wilson-Hubbard, 1961 *d*, which had become an insignificant object by early September, was last photographed at Flagstaff on October 12. A pair of good 90-minute exposures on that date showed a well-condensed but not quite stellar image of magnitude about 19.5. Two 120-minute exposures on November 3 failed to show the comet.

Routine observations of P/Faye, 1961 *c*, continued during October and November, with pairs of 60-minute exposures being obtained at Flagstaff each month. The comet appeared as a sharp, stellar condensation without coma, the magnitude being 18.2 on

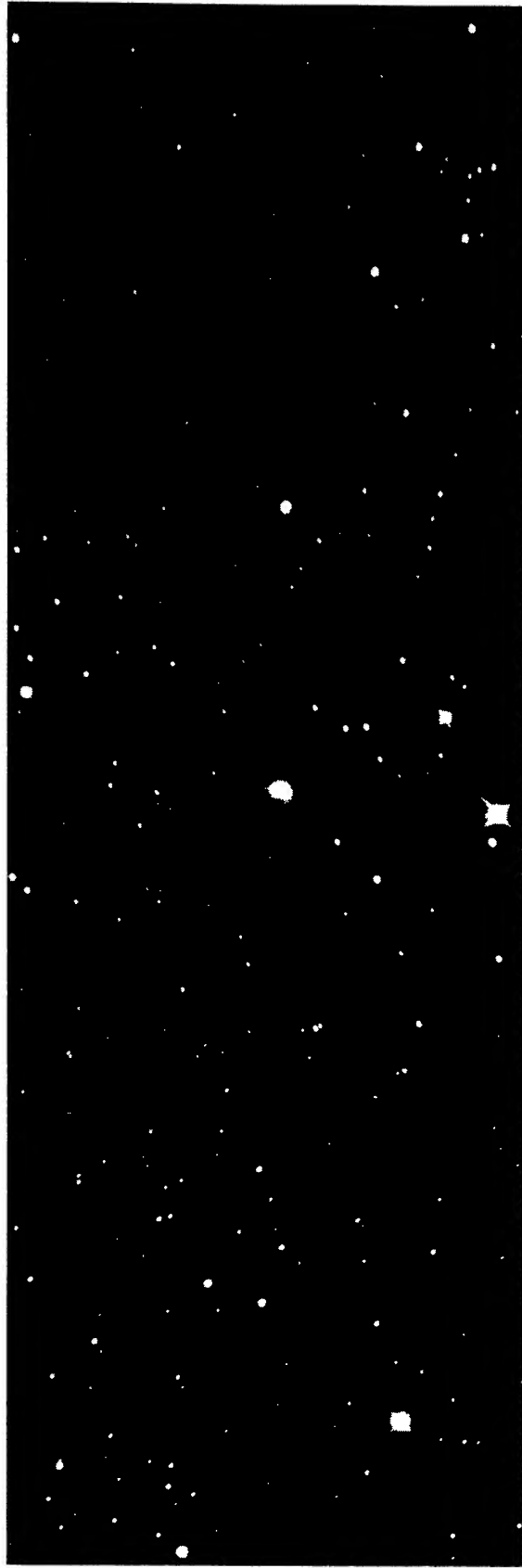
PLATE I



Official U.S. Navy Photograph

Comet Humason, 1961 *e*, on October 4, 1961. The exposure was 60^m on Kodak 103a-O. The heliocentric distance of the comet was 5.0 a.u. and the geocentric distance 4.1 a.u.

PLATE II



OCTOBER 12

OCTOBER 18

NOVEMBER 3

Official U.S. Navy Photographs

An outburst of Comet Schwassmann-Wachmann 1, 1925 II, in 1961. Each exposure was 30^m on Kodak 103a-O with the 40-inch reflector of the U.S. Naval Observatory, Flagstaff Station. The reproductions have been carefully matched for density, scale, and orientation. The lines at the edges of the left panel indicate the position of the comet, which looks like a fairly bright star.

October 2 and 17.8 on November 3. Comet Faye, which was already well west of the meridian in early evening in December, will be too close to the sun for further observations until after the middle of 1962.

Periodic comet Forbes was photographed as a strongly condensed object of 18th magnitude on October 12 and November 11. On the latter date 60-minute exposures also showed a faint, narrow tail extending 0.4 east from the nuclear condensation. The comet is approaching conjunction with the sun and fading steadily; hence, observations are not expected after December.

Periodic comet Schwassmann-Wachmann 2, 1960 *j*, was reobserved at Flagstaff on October 18 following conjunction with the sun. The magnitude of the strong central condensation was about 17.0 on a 30-minute exposure, and a faint tail extended 1.5 north of west. The comet was just barely visible with the 40-inch reflector. By November 18 a pair of 10-minute exposures were sufficient to show a not-quite-stellar condensation of magnitude 16.5, still with a faint, narrow tail. The comet was seen fairly easily with the 40-inch telescope as a small, fan-shaped diffuse spot. Though perihelion passage of Comet Schwassmann-Wachmann 2 occurred on September 5, 1961, the geocentric distance was to decrease steadily until the comet reached opposition at the beginning of April 1962. The effects of the decreasing geocentric distance and increasing heliocentric distance on the brightness nearly balance, and the magnitude of the comet is expected to continue nearly constant for some months.

A pair of very long exposures failed to record Comet Oterma, 1942 VII, on October 1. Observations of this comet are certainly terminated now for the 1961 observing season, and possibly for many years into the future, for Comet Oterma is currently undergoing a considerable change in its orbit occasioned by a prolonged close approach to Jupiter.

Comet Schwassmann-Wachmann 1, 1925 II, underwent a major outburst during October. The comet was recorded at Flagstaff on October 2 as a somewhat diffuse object of magnitude 18.5, nearly its normal quiescent brightness. By October 12 the comet had become a completely stellar object of 13th magnitude. Though the field was examined visually with the 40-inch reflector, the

comet was not recognized either visually or photographically until the plates were compared for a moving object. Unfortunately, the comet was very near a stationary point and could not be recognized by its motion during an exposure. By October 15 a ring-tail-shaped nebulosity 0'.4 in diameter had appeared, with a central condensation of magnitude 15.2 embedded in one end. This nebulosity expanded steadily, retaining the original ring-tail shape, while the brightness of the sharp central condensation decreased. By November 10 the nebulosity had reached a diameter of 2'.5, but was quite faint and ill-defined. The sharp, stellar nucleus was then of magnitude 18.8.

A prediction for the return of Comet Tuttle-Giacobini-Kresák has been provided by L. Kresák, who rediscovered this comet in 1951. It had been observed before only in 1858 and 1907, but not well enough on either occasion to determine with certainty the number of revolutions between the two epochs. Circumstances will be very favorable in 1962, with perihelion passage expected about April 23. It is hoped that the comet can be recovered as early as December or January, for the variation becomes very large closer to perihelion.