

COMET NOTES

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A bright new comet, designated 1970 *f*, White-Ortiz-Bolelli, in recognition of the earliest discovery reports, was first seen near Aldebaran shortly after sunset on May 18 by Graeme L. White, student at Wollongong University College, New South Wales, with the aid of 12×50 binoculars. He described the comet as having a starlike head, of magnitude 1 to 2, and a tail approximately 1° in length. He saw it again on May 20, with the naked eye as well as with binoculars, the comet by then having a tail more than 10° long. The next observation was on May 21.6, by Air France pilot Emilio Ortiz from a location 400 km east of Tananarive, Malagasy Republic. He described the head as of magnitude 0.5 to 1.0, and the tail 5° to 8° long.

Carlos Bolelli, Cerro Tololo Inter-American Observatory, saw the tail of the comet on May 21.95, although the head was below the horizon. Bolelli, R. Gonzales, and V. M. Blanco photographed the comet with the Michigan Curtis-Schmidt telescope the following nights, noting that the visible tail was some 10° in length. F. Gomez, meteorological assistant at the European Southern Observatory, La Silla, also saw the tail at about the same time as did Bolelli, and a further independent discovery was made there the following night by H. M. Maitzen and H. E. Schuster. Maitzen, Schuster, and A. Moffat photographed the new comet on May 23.97, and described the head then as of magnitude 4 to 5, and the tail 15° long. Further independent discoveries were made on May 22.9 by Rev. F. W. Gerber, Lucas González, Argentina; on May 23.9 by Jorge Balseiro Savio, Mercedes, Uruguay, and by H. Potter at the Cerro El Roble Station of the National Observatory, Santiago; and early on May 24 by G. M. Sprott at the Smithsonian observing station at Woomera, South Australia, and by Kellie at Port Hedland, Western Australia. Observations in response to an inquiry cabled from the IAU Telegram Bureau on May 22 were made on May 22.3

by V. L. Matchett, M. V. Jones, and S. C. McMillan, Brisbane, and on May 23.9 by Z. M. Pereyra, Córdoba. Newell, Astronomical Society of Queensland, reported that the comet had been observed there casually since May 19!

Although the difficulty of observing the comet so low in the evening twilight was reflected in inconsistencies in many of the positional observations, it seems likely that Comet White-Ortiz-Bolelli is a member of the Kreutz group of sungrazing comets (which includes the great comets of 1843, 1882, and 1965). B. G. Marsden has computed orbital elements on the assumption that the direction of perihelion matches that of the other members of the group. Perihelion passage apparently took place about May 14.5. Typically these comets pass perihelion less than a radius above the surface of the sun, and Marsden assumed a perihelion distance of 0.0090 a.u. ($2R_{\odot}$) in his calculations. The orientation of the orbits is such that Kreutz sungrazers can be reasonably well observed if the time of perihelion falls between August and March. But only once before has a likely member of the Kreutz group been observed at perihelion in the middle of the year—Comet Tewfik, seen during the total solar eclipse in Egypt on May 16, 1882.

Every one of the reported observations of Comet White-Ortiz-Bolelli has come from the Southern Hemisphere, again reflecting the spatial orientation of the orbits of the Kreutz sungrazers. According to Marsden's calculations the comet reached a maximum elongation from the sun of about 22° at the beginning of June. By June 3 the comet had faded to magnitude 9, and most observers were reporting the tail as less than 5° in length. In early July Comet 1970 *f* will be located about 19° due south of the sun. It will then move farther from the sun into the morning sky in August. But it is an open question whether the comet will have faded too much to be reached even with large telescopes when it has moved far enough from the sun to make prolonged photographic exposures possible.

The expected periodic comet Ashbrook-Jackson, 1970 *e*, was recovered by Pereyra with the 154-cm reflector of the Córdoba Observatory at Bosque Alegre on May 1 and confirmed by additional observations on May 2 and 3. The nuclear condensation was of magnitude 18.5, and a tail extended about $15''$. These observations seem to confirm an object tentatively reported by Pereyra

from a single observation under poor conditions on March 9. The star fields through which the comet was moving in March were extremely crowded ones, near the boundary between Scorpius and Corona Austrina, and poor weather only compounded the problem. Observations of P/Ashbrook-Jackson were obtained by the writer with the 229-cm reflector of the Steward Observatory on Kitt Peak on May 8, the comet images being confused with star trails on each of two 30-minute exposures in spite of a much less crowded star field than was involved earlier in the year. Although the plates were measured for accurate positions of the comet, no reliable magnitude estimate was possible. A pair of 60-minute exposures with the Catalina 154-cm reflector on June 7 showed the comet cleanly. The magnitude, corrected for considerable atmospheric absorption even for meridian observations at declination -41° , was then about 17.5. A trace of tail, extending about 0.2 northwest from the well-condensed nucleus, was visible on each plate.

Although the position of P/d'Arrest, 1970 *d*, in the morning sky remains a difficult one, a single plate was obtained with the 229-cm Steward reflector on May 7. The comet was visible, being distinctly more diffuse than stars, which were themselves rather diffuse in poor seeing at the low altitude involved. The photographic image showed a moderately sharp condensation about 0.1 in diameter embedded in a faint coma several times larger. The photographic magnitude of the condensation was about 17.9, but subject to some uncertainty because the image was distinctly softer than those of stars of the comparison sequence even on a plate taken in very poor seeing. Because of the current interest in P/d'Arrest in connection with possible space missions to comets, the May 7 photograph of this comet is reproduced in Plate I.

Routine observations of P/Pons-Winnecke, 1970 *b*, and of P/Kopff, 1970 *c*, were obtained with the 229-cm reflector of the Steward Observatory on May 8. Although P/Kopff could be seen rather easily, the noteworthy feature being a central condensation almost as sharp as stars, the photographic magnitude of the condensation was only 17.4. The pair of ten-minute exposures taken for P/Pons-Winnecke showed very small, practically stellar images of magnitude 18.1.

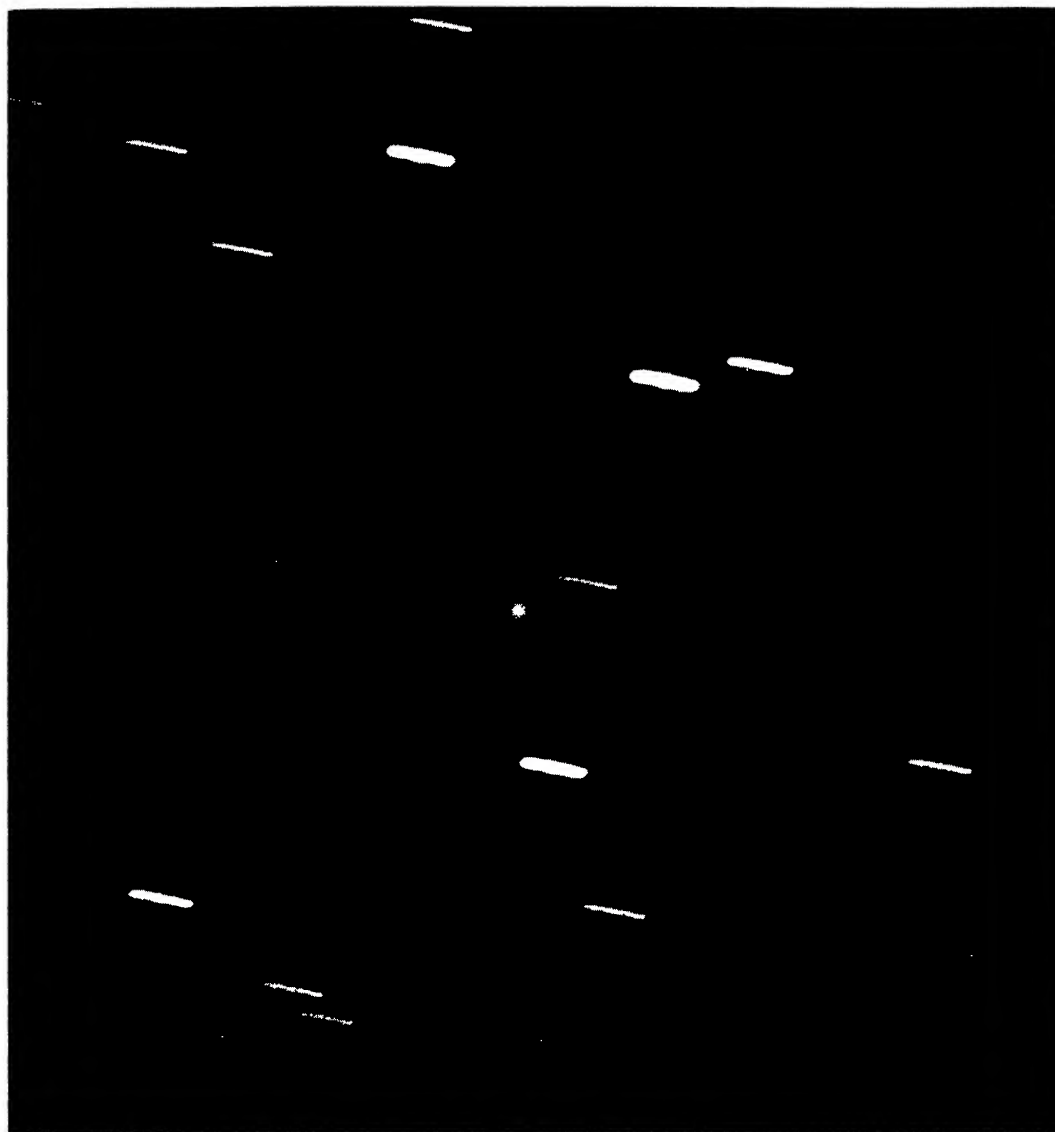


PLATE I

A 23-minute exposure of P/d'Arrest, 1970 *d*, taken on a Kodak 103a-O plate with the 229-cm reflector of the Steward Observatory on Kitt Peak on May 7, 1970. The photographic magnitude of the nuclear condensation was about 17.9.

Comet Čurjumov-Gerasimenko, 1969 *h*, proved to be a very challenging object in early May. A pair of 60-minute exposures with the Catalina 154-cm telescope on May 3 failed to show convincing images of the comet, in spite of very careful examination of the plates near the position expected for the comet. Since it is

important to obtain the best possible observational base for a good prediction at the next return, a further effort, this time successful, was made with the Steward 229-cm telescope on May 8. The pair of 60-minute exposures with the Kitt Peak instrument showed quite small and sharp, but weak, images of magnitude 21.0.

Thirty-minute exposures of Comet Tago-Sato-Kosaka, 1969 *g*, obtained with the Catalina 154-cm telescope on May 4, showed condensed images of magnitude 18.1. By the beginning of June the comet was too low in the evening twilight to hope for successful observations of this comet, then expected to be of 19th magnitude.

P/Whipple, 1969 *c*, was reobserved in the morning sky by the writer with the Steward 229-cm reflector on June 1, when a single 30-minute exposure showed a rather well-condensed image of magnitude 19.0. This comet should be about 1.5 magnitudes brighter, and very favorably located for observation near the time of perihelion passage in October.

Comet Kohoutek, 1969 *b*, now temporarily unobservable near the sun, was seen and photographed with the Catalina 154-cm telescope on May 3. Easily visible as a sharply condensed object with a tail extending some 2' north of east, the comet was estimated as of total magnitude 12. The nuclear photographic magnitude at the same time was 16.7.

Comet Thomas, 1968 *j*, faded only very slowly during April and May, the estimated magnitude of the well-condensed images being 18.7 on plates taken with the Catalina reflector on May 3 and probably not very much fainter than that on 60-minute exposures taken with the Steward reflector on June 1. The apparent brightness on the latter date was magnitude 19.6, but cirrus clouds were producing a light loss estimated as at least a magnitude at the time. This comet reaches evening quadrature later in June, and from that time on, the fading will be more rapid.

Periodic comet Schwassmann-Wachmann 1, which is subject to occasional brightness outbursts, was quite stellar in appearance and of magnitude 18.1 when photographed by the writer with the Catalina telescope on May 4. Although this comet has not been observed much in recent months, there has been little residual sign of activity.

Predictions have been published for several returning periodic comets that will be in position for recovery during June, July, or August. P/Encke, due at perihelion on January 9, 1971, according to independent calculations by B. G. Marsden and by N. A. Bohan, may be recovered as a 19th-magnitude object in the predawn sky in July.

A refined prediction by E. A. Vorob'ev for P/Johnson, 1949 II, for which a number of search plates were taken in 1969, has been communicated by N. A. Beljaev. Perihelion passage occurred near March 30, 1970, when the comet was too close to the sun for observation. The predicted perihelion time by Vorob'ev, March 30.535 ET, is about a day later than that found by W. H. Julian and F. D. Byers of the Computing Section of the British Astronomical Association. P/Johnson should be an 18th-magnitude object in mid-1970, perhaps a magnitude brighter than it was likely to have been in 1969. Recovery in June or July is probable, observers in the Southern Hemisphere having the best opportunity.

Marsden has provided elements and a current ephemeris for P/Arend-Rigaux, due at perihelion in April 1971, but in position and probably bright enough for recovery by August 1970. This comet, discovered in 1951, and reobserved in 1958 and 1963, has usually been of stellar appearance, without obvious cometary characteristics. It is not likely to be brighter than 18th magnitude at the current return.