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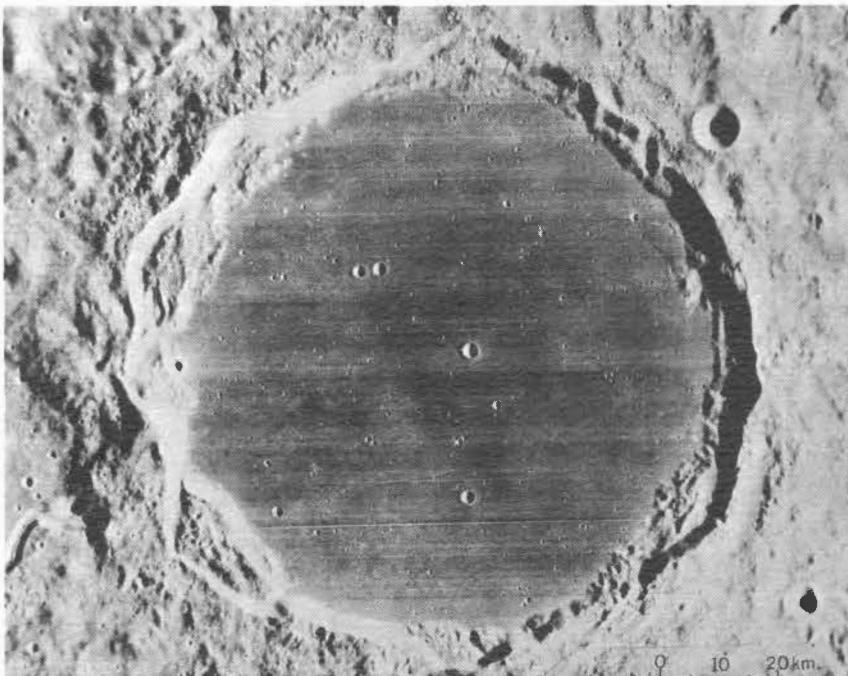

The lunar crater Plato photographed with the high resolution lens of Orbiter IV from an altitude of 2,884 kms. on May 20, 1967 at 6 hrs., 26.2 mins., Universal Time, colongitude 43.2 degrees. North at top and east (I.A.U. sense) at right in an unforeshortened view unknown to earth-based observers. The large near-central craterlet and the prominent twins above it and to the left are considered test objects for photography from the Earth. Note the extensive landslips on the wall and the dome-like object at the base of the northeast wall. Photograph contributed by Mr. John E. Westfall from the A.L.P.O. Lunar Photograph Library.

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ASSOCIATION OF LUNAR & PLANETARY OBSERVERS
ALPO

Founded In 1947

IN THIS ISSUE

LUNAR TRANSIENT PHENOMENA: THE ALPO PROGRAM, INTERIM REPORT

By: Charles L. Ricker and H. W. Kelsey, A.L.P.O. Lunar Recorders

As mentioned in Vol. 20, Nos. 9-10 of this Journal, this report will begin a series of articles which are the joint efforts of the authors. This first interim report is intended to bring the membership up to date on our activities and to suggest certain procedures for the study of Lunar Transient Phenomena. As mentioned before, the ALPO program is restricting its survey to six selected areas, namely: Alphonsus, Aristarchus-Herodotus, Eratosthenes, Kepler, Messier-Pickering, and Plato. In a limited way, Ross D has been added to this list for reasons which are explained below.

Our method of studying these formations has been to make a formal observation of each of the selected areas, complete with drawing and intensity estimates. Intensity estimates are made using green (Wratten 57 or 58), red (Wratten 25), and blue (Wratten 38A or 47 or 48) filters. In addition, some observers are also making "blink" estimates of the formations, using the simple blink device which was devised by P. K. Sartory of the B.A.A. and consists merely of a red (Wratten 25), and blue (Wratten 80B) filter mounted adjacent to each other between two glass slides. The blink observation is then made by holding this device between the eyepiece and eye, and passing to and fro between red and blue views, causing enhanced detail to stand out and "blink". Intensity estimates are then made of the enhanced area in red and in blue in an attempt quantitatively to describe the degree of observed enhancement.

It is hoped that the above approach will detect any transient event which may occur while the formation is under observation, and in addition any seasonal or secular changes which may be taking place within the formations will be detected by inference from analysis of the observations. Some success has been derived in both of these objectives. Several possible LTP's have been observed using the moon-blink device, the details of which have previously appeared in this Journal. The six selected areas have been kept under scrutiny for the past two years, and a voluminous file of detailed observations is on hand for each of them. A preliminary report has already appeared on the Messier-Pickering observations, and a longer report and more detailed analysis is in preparation on the observations of Plato.

The following individuals have participated in the program <u>since</u> the last report:

Kenneth Delano	12½" Rl	New Bedford, Mass.
Carl F. Dillon, Jr.	6" Rl	Lowell, Mass.
Chet B. Eppert	3" Rr	Philadelphia, Penn.
Greg George	2.4" Rr	Watertown, Conn.
Rodger Gordon	3½" Questar	Ackermanville, Pa.
H. W. Kelsey	8" Rl	Riverside, Calif.
Richard Krezovich	3" Rr	Syracuse, N. Y.
Eugene Lonak	10" Rl	Chicago, Ill.
Paul Pokusa	4½" Rl	Hammond, Ind.
Greg Redfern	6" Rl	Garden Grove, Calif.
William Richrath	6" Rl	Westchester, Ill.
Charles L. Ricker	10" Rl	Marquette, Mich.
Martin Senour	6" Rl	Rochester, N. Y.
Karl Simmons	8" Rl	Jacksonville, Fla.
Douglas Smith	6" Rl	Vinton, Va.
Zoltan Tiroler	3" Rr	Taberg, Sweden
Bruce Waddington	8" Rl	Long Beach, Calif.
Nick Weis	6" Rl	Galena, Ill.
Gary Wood	6" Rl	Galesburg, Ill.

While this list may look impressive, only about a third of those observers listed have made regular and systematic observations; and some have contributed only one or two observations. It is difficult in this type of report to give proper credit to the individuals who are the backbone of an observing program; but suffice it to say that these special efforts are appreciated, and without the dedicated observers who make regular observations without fail, the program would be a dismal failure.

There has existed a friendly spirit of coöperation with other societies and agencies. Regular quarterly reports of our blink observations are submitted to the BAA Lunar Section, who pioneered this type of observation and have achieved a number of confirmed LTP sightings. A detailed account of each LTP which is reported to this office is transmitted to

Mrs. Winifred Cameron, of NASA at Goddard Space Flight Center. Recently we have responded to a request which was made by Daniel Harris, of the Lunar and Planetary Laboratory, for simultaneous observations of Ross D; and several of our more active members are making regular observations of that difficult little formation as per Mr. Harris' schedule.

Figure 1 is an illustration of some of the interesting features which have been observed in the selected areas. These features should particularly be watched for and recorded in future observations. Of course, all of these features may not appear during any given observation, and also undesignated features may be recorded. Some of the formations will present an entirely different aspect at different angles of solar illumination. Eratosthenes in particular changes its appearance drastically throughout the lunation, and the illustration only shows some of the major features in Eratosthenes which appear under high light.

After the two years that the program has been in force, we can make a few suggestions which we hope will help make observers' efforts more meaningful and more useful. The value of a systematic program of studying one or more of the selected areas month after month by an individual observer cannot be over-emphasized. Only observers with a <u>large</u> amount of free telescope time can hope to cover all six areas adequately. For most of us, whose time is limited, a better plan will be to concentrate on one or two of the formations. Six observations each lunation of one formation are infinitely more valuable than only one observation each of six formations!

As with lunar programs in the past, there is a pronounced paucity of early morning observations (lunar sunset). It is realized that not too much can be done about this, but a special appeal must be made to observers who are doing early morning observing anyway to make every effort to secure some observations of the selected areas. Here is a way for those whose telescope time is limited to make a significant contribution, for the value of sunset observations is out of proportion to their numbers.

In conclusion, it may be said that the program thus far may be considered a success. A very valuable file of observations is on hand for each of the selected areas, and the task of properly analyzing these is well underway. In our next reports we shall present the details of the analysis. As has been stated in the past, it is the policy of this Section to accept observations from every interested member, regardless of age, experience, or aperture of his telescope. This policy has paid off in that a number of excellent lunar observers have been developed, who may otherwise have been lost to lunar studies. This result alone has made the program worthwhile, aside from the intrinsic value of the observations.

<u>A REPORT AND ANALYSIS OF SEVENTEEN RECENT LUNAR TRANSIENT PHENOMENA</u>.

<u>PART 1</u>.

By: H. W. Kelsey, A.L.P.O. Lunar Recorder, in Collaboration with Charles L. Ricker

Introduction

Although our understanding of Lunar Transient Phenomena (LTP) is still incomplete, it is becoming apparent that such phenomena are related to either solar phenomena, or lunar tidal conditions, or a combination of both. Since space does not permit a comprehensive analysis of the observations listed in Table I in relation to both solar activity, and lunar tidal conditions, this report is presented in two parts. This first part will attempt to demonstrate correlations between LTP and lunar tidal conditions.

This report is based upon observations which were all made by <u>amateurs</u>. From Table I, please note that our British colleagues are much more actively observing LTP than are American observers, despite appeals in this periodical and elsewhere for wider participation. Here is a problem to which we amateurs have opportunities to make real scientific contributions. It is also extremely significant that all of the listed observations were made with <u>normal</u> amateur telescopes, with nothing more sophisticated than color filters.

Discussion

Table I and the histogram, Figure 2, exhibit seventeen Lunar Transient Phenomena. This report is limited to an original 17, even though additional LTP have recently become known to the authors.

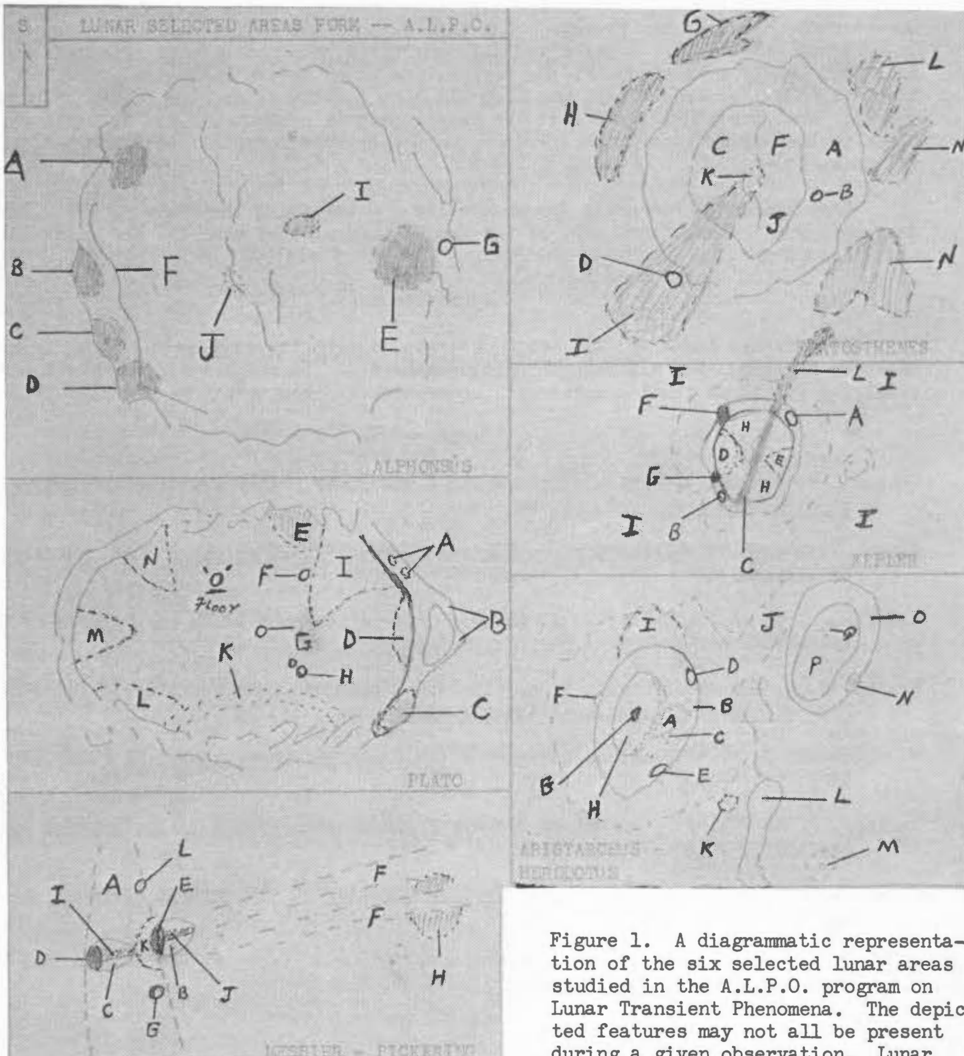

Figure 1. A diagrammatic representation of the six selected lunar areas studied in the A.L.P.O. program on Lunar Transient Phenomena. The depicted features may not all be present during a given observation. Lunar south at top, lunar west (I.A.U. sense) at right. See also the first article in this issue. The lettered designations shown were adopted by authors Ricker and Kelsey for convenience, and observers are asked to use these designations in future observations.

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The increase in the distribution of LTP's to lunar features other than to the classic Aristarchus area, namely to Gassendi, had been predicted for 1967 by Chapman (1967). This prediction was based on the lunar tidal-gravity concept. Chapman has remarked that librations, which can cause almost the entire incremental change in gravity at Aristarchus, sometimes cause extremely large tidal variations in gravity. The Aristarchus area has these extremely large amplitudes only at certain times during a six-year cycle; it has extremely small amplitudes at intervening times. During 1967, the second and fourth lunar quadrants, containing Aristarchus and Theophilus respectively, had extremely small tides. Conversely, the first and third quadrants, containing Mare Crisium and Gassendi respectively, had extremely large tides during 1967. In Figure 2 the number of recorded events is plotted versus the 27.6-day mean anomalistic period of the moon. Here, six events and nine events are associated with apogee and perigee respectively. The peak at 0.9 anomalistic periods past perigee is caused entirely by events Nos. 10-14 in Table I. Of these events, 3 were at Gassendi and 2 were near Aristarchus. At both craters, tidal-gravity lows preceded the events by 0-5 days. Therefore, the 0.9 histogram peak is related to the combined influence of perigee and low tidal gravity.

A fairly large majority of the sightings occurred during periods when the moon had a more eccentric orbit than average. Our data support the relationship found by Green (1966). In contrast, the data of Cameron and Gilheany (1967) did not support this relationship. In addition, the 17 events support the correlation shown in the histogram of Burley and Middlehurst (1966). The apogee peak was found lacking for LTP after June, 1964, by Middlehurst (1967). Now, our LTP suggest that the apogee peak is present again. It still remains unclear whether these apparent differences result from preferential observations, or from actual changes.

This sample is too small for conclusively determining the cause of LTP. However, the data analyzed in this first part of our report suggest that some LTP are related to lunar tidal conditions.

Acknowledgment

The authors thank Mr. William B. Chapman, Scientific Advisor for NASA, Lunar and Earth Sciences Division, for his help and encouragement in the preparation of this paper and for supplying the lunar tidal gravity data upon which the presentation depends.

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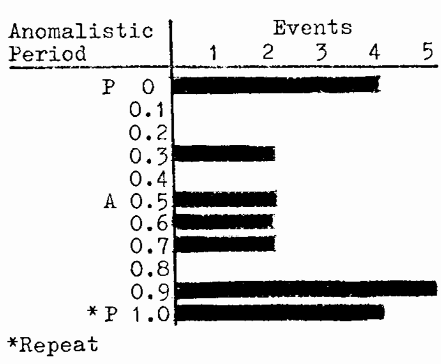

Figure 2. Histogram to show frequency of reported Lunar Transient Phenomena as a function of the moon's anomalistic period, measured from 0 at perigee (P) through 0.5 at apogee (A) back to 1.0 at the next perigee (P). The data are the 17 events tabulated in Table I on page 5. See also discussion in text by Mr. Kelsey on pages 3 and 4.

*Postscript by Editor. It is tentatively planned to publish the second part of Mr. Kelsey's report in our next issue. In this coming installment he will discuss possible relations between the same 17 recorded Lunar Transient Phenomena (page 5) and solar activity. A bulletin of the A.L.P.O. selected areas program appears elsewhere in this issue. There are a number of critical dates in the coming weeks on which intensive observations of some of our six areas (Figure 1 on page 3) are desired. We have received this request from Mr. William B. Chapman, of NASA.

Table I

No.	Date U.T.	Time U.T.	Feature	Approximate Eccentricity OF Orbit	Days From Peri. (P) Apo. (A)	Anomalistic Period	Days From Gravity Low(L) Normal(N) High(H)	Observing Technique	Observers and Association
1	4-30-66	2130	GA	Min.	P-1	.96		MB	Sartory, Moore and Moseley-BAA
2	5-1-66	1930	GA	Min.	P±0	0		MB	Sartory, Moore and Moseley-BAA
3	5-2-66	2005	AR	Min.	P+1	.03	H-2	MB	Sartory-BAA
4	8-4-66	2240	PL	Max.	A±0	.5	L+1	NF	Corvas and Moseley-BAA
5	9-2-66	0450	GA	Max.	A+1	.54		MB	Moseley-BAA
6	9-3-66	0127	GA	Max.	A+2	.57		MB	Moore, Moseley and Gill-BAA
7	1-21-67	1940	GA	Min.	A+5	.68	N	MB	Sartory, Moore and Moseley-BAA
8	2-17-67	1800	AL	Max.	A+4	.65	N	MB	Moore and Moseley-BAA
9	2-19-67	2030	AL	Max.	A+6	.72	N	MB	Moore and Moseley-BAA
10	3-22-67	1940	GA	Max.	P-4	.86	L	MB	Moseley-BAA
11	3-23-67	1840	GA	Max.	P-3	.89	L+1	MB	Sartory-BAA
12	3-23-67	1945	CH	Max.	P-3	.89	L+4	MB	Moore and Moseley-BAA
13	4-21-67	2120	SV	Max.	P-2	.93	L+5	NF	Darnell (Denmark)-BAA
14	5-20-67	0504	GA	Min.	P-2	.93	L+3	MB	Kelsey-ALPO/BAA
15	5-29-67	0640	AR	Min.	P+7	.25	H+2	NF	Anderson-ALPO
16	6-18-67	2110	GA	Min.	P±0	0		NF	Whippey-BAA
17	9-17-67	0205	AR	Max.	A-5	.32	N	MB	Delano-ALPO/BAA

AL - Alphonsus
AR - Aristarchus
CH - Cobra Head
GA - Gassendi
PL - Plato
SV - Schroter's Valley

MB - Moon Blink
This Moon Blink system is the non-electronic device developed by P. K. Sartory. The device utilizes the Wratten 25(Red) and 80B(Blue) Filters.
NF - No filters used.

MERCURY IN 1963

By: Richard G. Hodgson, A.L.P.O. Mercury Recorder

1. Introduction

This report of A.L.P.O. Mercury observations for the year 1963 has unfortunately been long delayed. In part this lag may be due to a change of Mercury Recorders in 1966, but a major factor has been the confusion brought to Mercury studies by the discovery of a 59± 5 day rotation period in early 1965. Subsequent discussion has established the stability of a 58.6462 day period of rotation,[1] and on this basis Dale Cruikshank and Clark Chapman have been able to reinterpret with profit many of the older visual drawings and to construct a preliminary map of the more prominent surface features of Mercury.[2] They have also supplied a new system of longitudes for the planet[3], which will be used in this paper and in the future work of the A.L.P.O. Mercury Section. Until the debate over the rotation period and the status of visual observations was settled and a new system of longitude was devised, meaningful interpretation of Mercury drawings was impossible.

Now that this confusion has been cleared away (with special thanks to Cruikshank and Chapman) the value of visual observations of Mercury with moderate aperture telescopes is evident. The drawings of Mercury for the years 1963-1967 in the A.L.P.O. files can now at last be properly analyzed, and will be reported upon in the coming months. A comprehensive study of all past A.L.P.O. Mercury drawings in the light of the newly-discovered rotation period and the new system of longitudes should be undertaken. The Mercury Recorder hopes that this study may be carried out in time, for there are a number of valuable observations which Clark Chapman's study did not consider. More immediate, however, is the task of publishing a good selection from the backlog of observations for the years 1963-1967, which the Recorder intends first to do, this report being the first installment.

2. Mercury's Elongations in 1963

During the year 1963 the planet Mercury had the following elongations and conjunctions:

Greatest Elongation E.	Inferior Conj.	Greatest Elongation W.	Superior Conj.
Jan. 4 (19°)	Jan. 20	Feb. 13 (26°)	Mar. 30
Apr. 26 (20°)	May 18	June 13 (23°)	July 13
Aug. 24 (27°)	Sept. 20	Oct. 5 (18°)	Nov. 5
Dec. 18 (20°)			

The most favorable elongations for observers in the Northern Hemisphere were those of late April and early October; in the Southern Hemisphere mid-February and late August were most favorable.

3. Observers and Observations in 1963

The planet Mercury was reasonably well observed in 1963 by A.L.P.O. members, although the number of observers declined from 1961 and 1962. Walter H. Haas, Larry Anthenien, and Clark Chapman deserve special praise for their systematic attempt to secure disc drawings; without their efforts there would be little to report. Some of these observations were made under unusual adversities -- on April 15 Larry Anthenien observed Mercury in a downpour of rain! Several observations were simultaneous or nearly so, and these are of particular interest.

The following observers participated in the work of the Mercury Section in 1963:

Observer	Station	Instrument(s)
Larry Anthenien	San José, California	6-inch (15cm.) Newtonian
Klaus Brasch	Rosemere, Quebec	8-inch (20cm.) Newtonian
Clark R. Chapman	Tucson, Arizona	4.3-inch (11cm.) refractor
	(Steward Observatory)	12½-inch (31.6cm.) Newtonian
Walter H. Haas	Las Cruces, New Mexico	6-inch (15cm.) Newtonian
		12½-inch (31.6cm.) Newtonian
Charles A. Wood	Tucson, Arizona (Steward Observatory)	12½-inch (31.6cm.) Newtonian

Of the periods centering on the seven elongations (see section 2 above) three were observed: the western elongation of February 13 (morning), the eastern elongation of August 24 (evening), and the western elongation of October 5 (morning). The observations of the other four periods, or Mercury apparitions, were distributed as follows in terms of disc drawings and intensity estimates respectively:

Elongation Period	Jan. 4 (E) Dec.30–Jan.15	Apr. 26 (E) Apr.11–May 9	June 13 (W) June 14–28	Dec. 18 (E) Dec. 4–29	Totals
Anthenien	4, 1	10, 8	1, 1		15, 10
Brasch		2, 0			2, 0
Chapman			6, 2		6, 2
Haas	10,10	11,11		11,11	32, 32
Wood			2, 0		2, 0
Totals	14,11	23,19	9, 3	11,11	57, 44

In addition Haas reported 5 other observations describing phase effects and providing verbal impressions of Mercury's surface when conditions would not permit disc drawings. Thus there was a total of 62 observations reported for the year.

These 62 observations were secured largely through use of six-inch reflectors. The use of various apertures was as follows:

Aperture	Number of Observations
4.3-inch (11cm.) refractor	5
6-inch (15cm.) reflectors	47
8-inch (20cm.) reflector	2
12½-inch (31.6cm.) reflectors	6
Not stated	2

This predominance of the six-inch reflector points up the need for more observations by those with larger instruments. When Mercury's disc is observed for the purpose of securing a drawing of surface features[4] it is seldom more than eight seconds of arc in diameter. While some useful work can be secured with 4-inch and 6-inch telescopes of good quality (and observations with such instruments are much better than no observations at all!), they lack the resolving power to see anything more than the grossest features. The time is at hand when more of the Mercury Section observing program should be undertaken with instruments of ten, twelve, and sixteen inches of aperture if we intend to make a contribution to scientific knowledge of this planet. There are plenty of these larger telescopes in North America; they need to be more in use. In our affluent society even the relatively poor man can afford to buy or to make one.

4. Disc Drawings

Fourteen disc drawings from among the fifty-seven submitted have been selected for publication as part of this report on pages 8, 9, and 10, and are representative of the best work being done on Mercury by A.L.P.O. members. All were made under relatively good (for Mercury!) observing conditions, and several are almost simultaneous. Inasmuch as Mercury has an extremely slow rotation rate, the surface presented to observers on Earth changes little from one day to the next, and thus the same features are present on the drawings of the successive days. In regard to the most prominent markings on Mercury there is, on the whole, a good measure of agreement among different observers. Considerable disagreement exists regarding the more subtle features of the planet due to limitations in resolving power of the apertures used, differences in seeing conditions, and variations in the artistic styles of the several observers. It would be well, therefore, until we have observations made with the aid of larger telescopes to center attention on discovering, confirming, and locating the most prominent features on the planet's surface.

The fourteen drawings reproduced here should be compared with the appropriate portions of the Chapman map published in <u>Sky and Telescope</u>, Vol. 34, No. 1 (July, 1967), page 25.

Some comments on individual drawings should be made. The two drawings of January 6 by Anthenien and Haas show a good measure of independent agreement on the more prominent features, and are also in substantial agreement with the Chapman map. Similar agreement with the Chapman map can be found in the Brasch drawing of May 3, and in the Haas drawings of December 14 and 21. Chapman (June 19 and 28) agrees very well with his own map, but then perhaps he should inasmuch as these two drawings were among the 130 he used in its construction. There is also fairly good agreement between Haas' drawings of January 6 and December 21 when the central meridians (C.M.) were 313° and 310° respectively.

All of the above should be a source of encouragement to students of Mercury. On many

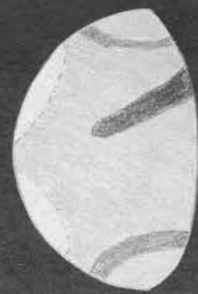

Figure 3a. Mercury drawing by W.H. Haas, 1963 Jan. 1, 0^h16^m, U.T., 6-inch refl., 188X. Seeing 0-3; Transparency 4. Long. of C.M. = 287°.

Figure 3 b. Mercury drawing by W.H. Haas, 1963 Jan. 6, 0^h16^m, U.T., 6-inch refl., 188X. Seeing 1-3; Transparency 2. Long. of C.M. = 313°.

Figure 4a. Mercury drawing by L. Anthenien, 1963 Jan. 6, 1^h 40^m U.T., 6-inch refl., 128X. S = 1-4; T = 1-3. Longitude of C.M. = 313°.

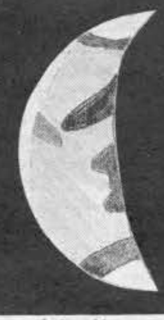

Figure 4b. Mercury drawing by W.H. Haas, 1963 Jan. 10, 0^h24^m U.T., 6-inch refl., 188X. S = 1-2; T = 4. Long. of C.M. = 335°.

Figure 5 a. Mercury drawing by L. Anthenien, 1963 Apr. 16, 1^h 57^m U.T., 6-inch refl., 128X and 146X. S = 4-5; T = 4. Long. of C.M. = 107°.

Figure 5 b. Mercury drawing by K. Brasch, 1963 May 3, 0^h30^m U.T., 8-inch refl., 370X. S = 1-3; T = 3-4. Long. of C.M. = 200°.

details disagreement remains, a challenge for the future.

Two things should be pointed out in connection with these drawings. First, Chapman asserts that positions on his map are accurate only to about 10 degrees, and that Mercury's C.M. can presently be determined only with an accuracy of ± 8 degrees.[5] (It is also assumed that the planet's equator lies approximately in the orbital plane; if this assumption is significantly in error, positional errors in the Chapman map may be even greater than 10

Figure 6a. Mercury drawing by C.R. Chapman, 1963 June 16, 12h19m U.T., 12½-inch refl., 250X. S = 5-7; T = ?. Long. of C.M. = 103°.

Figure 6b. Mercury drawing by C.A. Wood, 1963 June 16, 12h 19m U.T., 12½-inch refl., 290X. S = 7; T = 4. Long. of C.M. = 103°.

Figure 7a. Mercury drawing by C.A. Wood, 1963 June 19, 12h19m U.T., 4.3-inch refr., 275X. S = 2-3; T = 3. Long. of C.M. = 120°.

Figure 7b. Mercury drawing by C.R. Chapman, 1963 June 19, 12h19m U.T., 4.3-inch refr., 275X. S = 2; T = ? Long. of C.M. = 120°.

Figure 8a. Mercury drawing by C.R. Chapman, 1963 June 28, 13h49m U.T., 12-inch refl., 305X. S = 8; T = good (var.); daylight observation. C.M.=163°.

Figure 8b. Mercury drawing by W.H. Haas, 1963 Dec. 14, 0h17m U.T., 6-inch refl., 188X. S = 1-2; T = 4½. Long. of C.M. = 275°.

degrees). One must be aware of these limitations when comparing these drawings with the Chapman map.

Secondly, one is made aware that many areas of Mercury's surface were not observed in 1963. Most of the drawings of quality made in that year cover (approximately) longitudes from 100° to 200°, and from 275° to 335°. Some of the most interesting features of the Chapman map -- the very dark areas in longitudes 0° to 60°, for example -- passed unobserved and unconfirmed. This is, of course, not the fault of observers (unlike Jupiter, Mercury does not rotate in a night!), but it serves to emphasize the importance of persistent and systematic observing over a period of years with adequate apertures until the gaps are all filled.

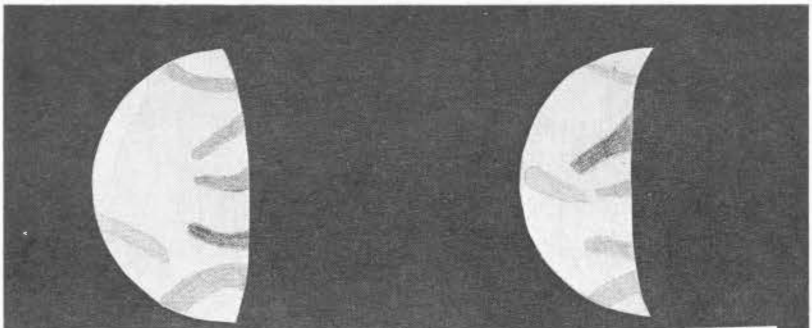

Figure 9a. Mercury drawing by W.H. Haas, 1963 Dec. 18, 0^h17^m U.T., 6-inch refl., 188X. S = 1-3; T = 4½. Long. of C.M. = 295°.

Figure 9b. Mercury drawing by W.H. Haas, 1963 Dec. 21, 0^h16^m U.T., 6-inch refl., 188X. S = 2; T = 4. Long. of C.M. = 310°.

5. The Observed Phase

Estimates of observed phase were not given special attention by Mercury observers in 1963, but most drawings received were in fairly close agreement with the theoretical phase in view of the difficulties involved. When Mercury was a slender crescent, however, the value of k (the illuminated proportion of the disc) tended to be overestimated, which is not unusual. No unusual terminator irregularities were noted during the year.

6. Intensity Observations

Happily, of the 57 drawings submitted, 44 were accompanied by intensity estimates. These can often be of help when interpreting the drawing, and should be made whenever possible. Unfortunately, not all observers have followed the scale recommended on Mercury Section observing blanks. In the future all members should use this 0 to 5 scale in their Mercury observations, where 0 represents the darkest markings of the planetary surface, and 5 the very brightest areas. The average surface brightness should be considered as 3.0. Please note that 0 is not "sky black" since the planet is seldom seen against a dark sky.

7. Conclusion

The most important part of the Mercury Section observing program at present is that of securing good quality disc drawings to form the basis for an improved map of the major features of Mercury's surface. The emphasis must be upon <u>good quality</u>. Observers must be careful to concentrate on hermographical details within the resolving power of their telescopes. In the light of this truth those with large aperture instruments at their disposal should make every effort to observe Mercury at every favorable opportunity.

In conclusion, I wish to express my thanks to all the A.L.P.O. members who have contributed to this report, including Geoffrey Gaherty, the former A.L.P.O. Mercury Recorder, who was the original recipient of these 1963 observations. I hope the delay of this report has not discouraged any of our observers; their labors are much appreciated.

A report of observations for 1964 will be published soon. Any unreported observations for the years 1965 through 1967 should be submitted promptly, for work on these reports is now beginning with publication planned in a few months.

References

1. Cf. "Recent Studies of the Rotation of Mercury" in <u>The Strolling Astronomer</u>, Vol. 20, Nos. 5-6 (published June, 1967), 73-75.

2. <u>Sky and Telescope</u>, Vol. 34, No. 1, (July, 1967), 24-26.

3. <u>Ibid</u>., pg. 26.

4. In transit upon the Sun the planet may be somewhat larger, of course.

5. Sky and Telescope, loc. cit.

ALPO COMETS SECTION REPORT ON COMET SEKI 1967b

By: Dennis Milon, ALPO Comets Recorder

To discover a naked eye comet takes an alert observer, but recognizing a 10.5 magnitude one is quite amazing! Yet this is what Tsutomu Seki of Kochi City, Japan, did on the morning of February 4, 1967. From his rooftop observatory he spotted the diffuse-looking comet in Hercules while sweeping with 5-inch binoculars.

Comet Seki brightened slightly as it approached perihelion; but few ALPO observers sent observations, and these cover less than a month. At the same time it was receding from the earth, and getting closer to the sun in the sky. On February 15th it was 0.94 of an astronomical unit from the earth and 0.79 A.U's. from the sun.

Reports on this comet were sent in by four observers:

Michael McCants	Austin, Texas
Tom Middlebrook	Nacogdoches, Texas
Tsutomu Seki	Kochi City, Japan
Karl Simmons	Jacksonville, Florida

Comet Seki 1967b

1967 UT			magnitude	diameter
Feb. 4.8	Seki	20X120	10.5	
9.25	McCants	$9\frac{1}{2}$-inch refractor	10.0	
11.44	Simmons	8-inch reflector	10.2	less than $\frac{1}{2}'$
17.83	Seki	20X120	8.5	
21.48	Middlebrook	8-inch reflector	10	about 2'

Simmons used AAVSO Lyra charts for his magnitude estimate.

Mr. Seki contributed an ephemeris which he computed from two positions by himself and one by George Van Biesbroeck. The parabolic elements are: T 1967, March 13.4 U.T.

q 0.4971 AU ☊ 195°.3
ω 137°.8 i 103°.6

These elements show that the motion of Comet Seki was retrograde (opposite to the planets' motion) since i (inclination of the orbital plane) is greater than 90°. At perihelion on March 13th the comet was in the Square of Pegasus, due north of the sun, and too close to the sun to be seen.

To calculate the orbit, Seki used a table of logarithms. In a letter of September 7, 1967, he said that a hand-driven desk calculator is now in use. He also noted that an improved orbit for 1967b is now being calculated by Ichiro Hasegawa.

ALPO COMETS SECTION REPORT ON COMET WILD 1967c

By: Dennis Milon, ALPO Comets Recorder

The second new comet discovery of 1967 was made by Paul Wild of the Astronomical Institute, Bern, Switzerland. It was found on a photograph taken on February 11.1 UT at the circumpolar position of $7^h\ 16^m$, +81° 45'. Remaining in the evening sky, the new comet moved almost due south at about 3° per day. The Full Moon occurred on February 24th, and this comet was then a difficult object with its fast motion in a bright sky. Identification was aided by an ephemeris calculated by Michael McCants and Don Wells at the University of Texas, which was mailed to Comets Section observers on February 18th. This orbit shows that perihelion was on March 2nd at 1.32 Astronomical Units. After that time the comet moved away from the sun and the earth.

Observations were sent in by the following:

Leo Boethin Abra, Philippines

Figure 10. On a rooftop observing platform, Tsutomu Seki stands beside the 12-centimeter (5-inch) 20-power binoculars that were used in discovering Comet Seki 1967b on February 4, 1967. These binoculars have a field of three degrees.

Figure 11. The altazimuth-mounted 20 X 120 binoculars are supported by a wood pier. A cord supplies electricity for the heated dewcaps, which prevent fogging of the objectives. To the left is a 15-centimeter f/6.3 reflector having a 2°.5 field at 27X.

Mike McCants	Austin, Texas
Karl Simmons	Jacksonville, Florida
Don Wells	Austin, Texas

ALPO Observations

1967 UT				magnitude	size
Feb. 13.17	McCants, Wells	9½"	refractor	9½ or 10	1'-2'
23.01	Simmons	8"	reflector	10.5	less than 1'
24.09	Simmons	8"	"	10.6	less than ½'
26.08	Simmons	8"	"	11.0	same
Mar. 1.23	McCants, Wells	9½"	refractor	9½-10½	2'
2.04	Simmons	8"	reflector	11.0	less than ½'
11.02	Simmons	8"	reflector	11.5	1'
11.12	McCants, Wells	10"	reflector	10.5	2'
12.07	Simmons	8"	reflector	$\leq$12.5	2'-3'
14.58	Boethin	8"	reflector		diffuse, no central condensation.

Simmons used AAVSO charts for magnitude estimates, except on March 12th, when he used NGC 2818, magnitude 12.5.

Comet Wild was not the only comet in the sky in February and March. In fact, ALPO members observed three comets in the evening sky -- Wild, Rudnicki, and Tuttle -- plus Comet Seki in the morning! Mike McCants at Austin, Texas, compared the brightness of Wild to Tuttle on March 11th and noted that Tuttle was brighter by half a magnitude in his 10-inch reflector.

JUPITER IN 1966-67: ROTATION PERIODS

By: Phillip W. Budine, A.L.P.O. Assistant Jupiter Recorder

The highlights of the 1966-67 apparition were the development of a South Tropical Zone Sectional Disturbance and the existence of two distinct currents in the northern part of the North Equatorial Belt, one current being normal and the other abnormally fast. The three long-enduring white South Temperate Zone ovals continued to be prominent. The Equatorial Zone was extremely active in all longitudes. The Red Spot was well defined during most of the apparition.

Date of Opposition: 1967, January 20.
Dates of Quadrature: 1966, October 27; 1967, April 16.
Declination of Jupiter: 20°N (at opposition).
Equatorial Diameter: 46.1 seconds (at opposition).
Zenocentic Declination of Earth: + 0°.8 (at opposition).

This report is based on 7,180 visual central meridian transit observations submitted by 22 observers. Fifty-four percent of these transits (3,797) form usable drifts for 271 Jovian spots distributed in 15 different atmospheric currents. The contributing observers are listed below by name and number of transits submitted, along with station of observation and telescope(s) employed.

Borde, Jack A.	Concord, Calif.	10-in. refl.	10t.
Budine, Phillip W.	Binghamton, N. Y.	10-in. refl.	1750t.
Carlino, L. M.	Buffalo, N. Y.	6-in. refr.	3t.
Delano, Kenneth J.	New Bedford, Mass.	12½-in. refl.	36t.
Farrell, Joanne	Binghamton, N. Y.	3-in. refr.	
		4-in. refr.	705t.
Feiereisen, William	Madison, Wisc.	4½-in. refr.	12t.
Gordon, Rodger W.	Ackermanville, Pa.	3½-in. refl.	34t.
Heath, Alan W.	Long Eaton, Nottingham, England	12-in. refl.	39t.
Hicks, Bob	Quito, Ecuador	10-in. refr.	22t.
Larkin, Kip	Binghamton, N. Y.	3-in. refr.	207t.
Mackal, Paul K.	Mequon, Wisc.	6-in. refl.	24t.
Melville, E. C.	Jamaica, West Indies	9.6-in. refl.	144t.
Moore, Patrick	Armagh, Northern Ireland	3-in. refr.	
		8½-in. refl.	

Moore, Patrick	Armagh, Northern Ireland	10-in. refr. 12½-in. refl.	1686t.
Pollak, Charles J.	Binghamton, N. Y.	8-in. refl.	530t.
Ricker, Charles L.	Marquette, Michigan	8-in. refl.	49t.
Rost, Carlos E.	Santurce, Puerto Rico	6-in. refl.	461t.
Schwab, Bill	Holgate, Ohio	8-in. refl.	14t.
Shartle, Stanley M.	Indianapolis, Ind.	12½-in. refl.	1153t.
Stewart, Robert N.	Indianapolis, Ind.	10-in. refl.	165t.
Thiede, Eric	Madison, Wisc.	4½-in. refr. 6-in. refr. 6-in. refl. 10-in. refl. 15.6-in. refr.	75t.
Wacker, Wynn	Madison, Wisc.	6-in. refl.	53t.
Winkler, William R.	Suitland, Maryland	8-in. refl.	8t.

The distribution of transit observations by months is as follows:

1966, August	26	1966, December	769	1967, April	836
September	161	1967, January	1019	May	440
October	499	February	1445	June	112
November	608	March	1265		

In the tables which follow, the first column gives an identifying number or letter to each object. The second column indicates whether the object was dark (D) or bright (W) and whether the preceding end (p), center (c), or following end (f) was being observed. The third column gives the first and last dates of observation; the fourth column, the longitudes on those dates. The fifth column gives the longitude at opposition, January 20, 1967. The sixth column gives the number of transits. The seventh column indicates the number of degrees in longitude that the marking drifted in 30 days, negative when the longitude decreased with time. The eighth column shows the rotation period in hours, minutes, and seconds.

S. S. S. Temperate Belt, System II

No.	Mark	Limiting Dates	Limiting L.	L.	Transits	Drift	Period
1	Dp	Feb. 26 - Apr. 29	178° - 74°	---	4	-49°.5	9:54:33
2	Dc	Oct. 29 - Apr. 1	346 - 254	324°	4	-17.7	9:55:16

Mean Rotation period: 9:55:16
(without No. 1)

S. S. Temperate Belt, System II

No.	Mark	Limiting Dates	Limiting L.	L.	Transits	Drift	Period
1	Dc	Oct. 29 - Feb. 8	54° - 11°	25°	9	-12°.6	9:55:23
2	Df	Nov. 23 - Feb. 17	49 - 12	27	6	-12.8	9:55:23
3	Dc	Dec. 1 - Mar. 26	76 - 10	62	9	-16.9	9:55:18
4	Dp	Oct. 22 - Apr. 2	85 - 17	66	15	-12.6	9:55:23
5	Dc	Mar. 2 - Apr. 2	49 - 24	---	6	-25.0	9:55:06
6	Df	Nov. 13 - Apr. 2	93 - 28	78	13	-13.5	9:55:22
7	Dc	Feb. 4 - Mar. 25	94 - 44	---	4	-29.4	9:55:00
8	Dc	Dec. 13 - May 20	182 - 35	159	11	-27.4	9:55:03
9	Dp	Dec. 2 - Mar. 19	260 - 150	214	5	-30.6	9:54:59
10	Dc	Dec. 2 - Apr. 15	271 - 159	238	7	-24.9	9:55:07
11	Df	Dec. 2 - Mar. 13	279 - 205	242	3	-21.8	9:55:11
12	Dc	Dec. 2 - May 26	295 - 169	263	17	-21.2	9:55:12
13	Df	Feb. 5 - May 2	258 - 200	---	7	-20.0	9:55:13

Mean rotation period: 9:55:06

Nos. 4, 5, and 6 were a dark elongated condensation on the N. edge of the SSTB. It was observed very near the oval DE during the apparition, approaching closest on February 25 - 28, 1967. It was observed well by Shartle. Other observers who recorded it were Rost, Heath, Thiede, Farrell, and Pollak.

No. 9 was the preceding end of a darker section of the SSTB. Observers of this section were Larkin, Shartle, and Pollak.

Nos. 12 and 13 were the outstanding feature of the SSTB. It was called "Feature X" by Patrick Moore, and his description of this object follows: "remarkable; northward extension or spot from the SSTB; with a Sartory Blink I confirmed a redness hue, it was faint, but it was there; it was surrounded by a hollow and associated with this feature was an <u>extra belt</u> in the STeZ which was narrow but definite." The center of Feature X was in conjunction with the center of oval BC on February 5, 1967 at longitude 252° (II); see Figure 12.

S. Temperate Current (S. edge STB, STeZ), System II

No.	Mark	Limiting Dates	Limiting L.	L.	Transits	Drift	Period
1	Dp	Oct. 22 - Jan. 13	82° - 14°	--	4	-24°.3	9:55:07
2	Dc	Oct. 8 - Dec. 10	97 - 59	--	7	-17.3	9:55:17
3	Wc	Dec. 3 - Mar. 2	116 - 51	84°	5	-21.7	9:55:11
D	Wp	Oct. 8 - Jun. 25	114 - 302	42	63	-22.1	9:55:10
4	Wc	Oct. 8 - Jun. 25	126 - 310	51	86	-22.0	9:55:10
E	Wf	Oct. 8 - Jun. 25	130 - 318	62	75	-22.1	9:55:10
5	Wp	Jan. 31 - Jun. 2	167 - 90	--	5	-18.8	9:55:15
6	Wc	Jan. 31 - Jun. 2	170 - 93	--	5	-18.8	9:55:15
7	Wf	Jan. 31 - Jun. 2	174 - 96	--	6	-19.0	9:55:15
F	Wp	Oct. 2 - Jun. 2	214 - 60	148	53	-19.0	9:55:15
8	Wc	Oct. 2 - Jun. 2	219 - 66	156	68	-19.0	9:55:15
A	Wf	Oct. 2 - Jun. 2	226 - 76	163	66	-19.0	9:55:15
9	Wc	Oct. 26 - Jun. 4	264 - 126	209	12	-18.7	9:55:15
B	Wp	Oct. 29 - Jun. 7	302 - 166	250	59	-18.4	9:55:15
10	Wc	Oct. 29 - Jun. 7	310 - 175	259	74	-18.3	9:55:15
C	Wf	Oct. 29 - Jun. 7	318 - 182	266	58	-18.4	9:55:15
11	Dc	Dec. 4 - Apr. 30	316 - 246	297	6	-14.3	9:55:21
12	Wc	Nov. 23 - May 19	328 - 244	305	8	-14.7	9:55:21
13	Wc	Jan. 2 - May 20	129 - 26	119	11	-27.7	9:55:03

Mean rotation period: 9:55:14
(without Nos. 1 and 13)

The three long enduring ovals were distinctly visible throughout the apparition. The length of the ovals averaged about 16 degrees.

The center of the Red Spot was in conjunction with the center of DE on March 2, 1967 at longitude 30° (II); see Figure 12. The drift of DE in decreasing longitude became retarded on about Feb. 11, 1967 and then resumed its former rate on about March 5th after having fallen back about 6° from the extrapolated line of its earlier drift. The oval BC was extremely bright and white during the apparition. The oval DE was often described as "brilliant" by observers. Oval FA was recorded brightest during mid-February.

No. 1 was the preceding end of a dark section in the STB. No. 2 was a dark elongated projection on the south edge of the STB, observed well by Farrell and Pollak. No. 3 was a very bright white nodule on the south edge of the STB observed by Carlino and Pollak. Nos. 5, 6 and 7 were a bright white gap in the sout edge of the STB recorded best by Rost, Shartle, and Stewart. No. 11 was a very dark projection on the south edge of the STB observed well by Farrell and Budine. It would seem that Nos. 1 and 13 were rotating under the influence of the S.S. Temperate Current.

Middle STB, System II

No.	Mark	Limiting Dates	Limiting L.	L.	Transits	Drift	Period
1	Df	Feb. 7 - Apr. 29	168° - 95°	--	3	-26°.1	9:55:05
2	Df	Jan.19 - Apr. 29	195 - 121	194°	4	-21.8	9:55:11
3	Dp	Dec. 4 - Mar. 13	270 - 217	258	3	-15.6	9:55:19

Mean rotation period: 9:55:12

Red Spot Region, System II

Mark	Limiting Dates	Limiting L.	L.	Transits	Drift	Period
RSp	Sept. 22 - Jun. 13	15° - 18°	15°	106	+0°.37	9:55:41
RSc	Aug. 10 - Jun. 13	28 - 31	28	139	+0.31	9:55:41
RSf	Sept. 22 - Jun. 13	38 - 42	38	105	+0.49	9:55:41
RSHp	Sept. 22 - Apr. 1	12 - 14	12	22	+0.31	9:55:41
RSHc	Sept. 22 - May 20	23 - 23	23	20	0.00	9:55:41
RSHf	Sept. 22 - Apr. 14	39 - 42	39	12	+0.44	9:55:41
			Mean rotation period:			9:55:41.0

The Red Spot was generally dark and conspicuous throughout the apparition. It appeared as an pinkish-orange ellipse with a very dark border and a lighter interior. Visual transits gave the Red Spot a mean length of 23-24°.

South Tropical Zone, System II

No.	Mark	Limiting Dates	Limiting L.	L.	Transits	Drift	Period
1	Wc	Feb. 5 - Mar. 18	1° - 37°	--	9	+25°.7	9:56:16
2	Wc	Jan. 29 - Apr. 12	47 - 39	--	13	- 3.2	9:55:36
3	Wc	Feb. 22 - May 1	60 - 59	--	5	- 0.4	9:55:40
4	Wc	Nov. 13 - Feb. 13	107 - 85	91°	3	- 7.1	9:55:31
5	Dc	Nov. 13 - Feb. 13	108 - 88	94	4	- 6.5	9:55:32
6	Wc	Dec. 13 - Apr. 29	150 - 118	136	6	- 7.1	9:55:31
7	Wc	Feb. 9 - Apr. 15	159 - 154	---	7	- 2.3	9:55:37
8	Wc	Dec. 13 - May 14	187 - 178	185	5	- 1.8	9:55:38
9	Dp	Jan. 31 - May 12	235 - 205	---	16	- 8.6	9:55:29
10	Dc	Jan. 31 - Apr. 13	241 - 227	---	5	- 5.6	9:55:33
11	Wc	Jan. 19 - Apr. 30	251 - 241	250	6	- 2.9	9:55:37
12	Df	Feb. 7 - May 12	259 - 246	---	5	- 4.1	9:55:35
13	Wc	Jan. 29 - May 12	259 - 250	---	7	- 2.6	9:55:37
14	Wc	Jan. 10 - May 12	297 - 264	294	4	- 8.5	9:55:29
15	Wc	Dec. 4 - Mar. 18	321 - 296	312	4	- 5.2	9:55:34
16	Wc	Dec. 4 - Feb. 27	328 - 307	317	5	- 7.5	9:55:30
17	Dc	Feb. 27 - May 15	309 - 295	---	4	- 5.4	9:55:33
18	Wc	Feb. 22 - Jun. 3	330 - 329	---	6	- 0.3	9:55:40
19	Wc	Jan. 29 - May 2	227 - 204	---	11	- 7.2	9:55:31
				Mean rotation period: (without No. 1)			9:55:34

The highlight of the South Tropical Zone was the development of a Sectional South Tropical Zone Disturbance, which was first observed as a dark diagonal column connecting the north edge of the STB with the south edge of the SEB_S. Then it developed a prominent prec. end and rather faint fol. end resembling the appearance of a classical disturbance similar to the 1901-40 Disturbance. The dark diagonal was observed on drawings as early as January 2, 1967 by Carlos Rost and on January 21, 1967 by Bill Moser. Transits were first obtained of the developed prec. end on January 31, 1967, when the prec. end was observed by Joanne Farrell and was confirmed by Kip Larkin. The prec. end was observed as a double festoon, one festoon being very dark and the other one fainter. The longitude of the prec. end on January 31, 1967 was 235° (II). The dark center of the disturbance was also observed on January 31, 1967; and transits by Budine placed the center at a longitude of 241° (II). The fol. end of the STrZ Disturbance was first observed as a prominent feature on February 7, 1967 by Budine and was confirmed by Farrell at a longitude of 259° (II).

In the rotation period table Nos. 9, 10, and 12 are the South Tropical Zone Disturbance, also see Figure 12. The prec. end was the darkest and most prominent part of the disturbance. The prec. end was observed as a prominent feature by Paul Mackal on April 8 and April 20, 1967 and by L. M. Carlino on March 25, 1967. The Sectional Disturbance did not attain the prominence or darkness of the 1901-40 Disturbance. Its relative faintness at times made it very difficult for many observers. It must be definitely classified as a sectional type disturbance.

The South Tropical Zone varied considerably in brightness in different longitudes;

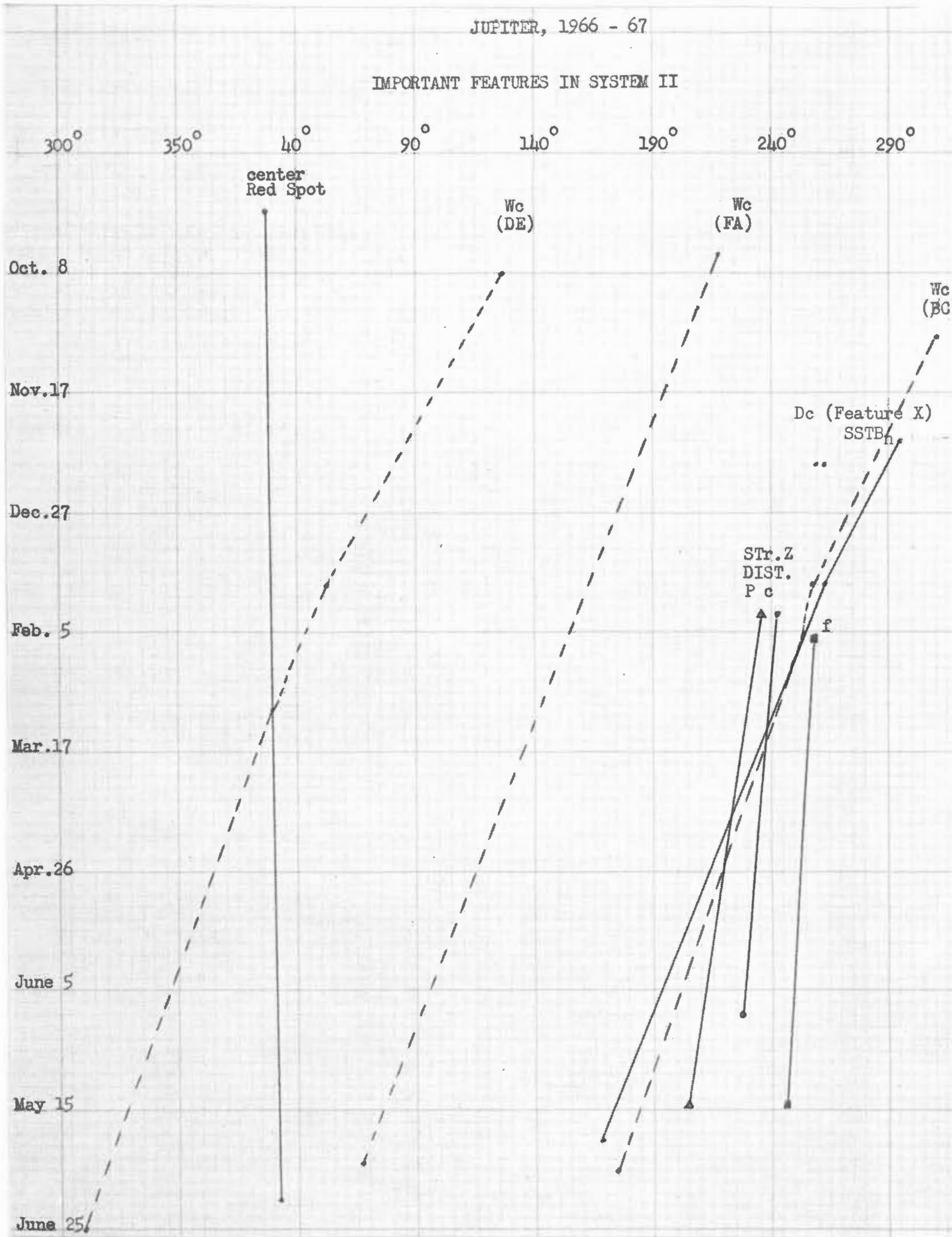

Figure 12. Drift-lines for selected features on Jupiter in System II, as observed by A.L.P.O. members during the 1966-67 apparition. Graph prepared and contributed by Phillip W. Budine, Assistant Jupiter Recorder. See also discussion in text of Mr. Budine's article in this issue. Longitude in System II is plotted against date in 1966 or 1967. The dashed lines show the drifts of the three South Temperate Zone ovals.

and the zone was very active with bright areas and dusky sections, making the region the most active it has been in many years.

Nos. 1 and 2 were very bright nodules observed in the STrZ near the Red Spot region. They were observed regularly by Stewart, Shartle, Thiede, Farrell, and Budine. No. 5 was a dark diagonal column with a central dark spot transversing the STrZ, observed best by Rost and Pollak. Nos. 6 and 8 were bright ovals observed in the STrZ. No. 11 was the bright oval following the STrZ Disturbance. No. 17 was a prominent dark festoon in the STrZ. No. 19 was the bright oval near the preceding end of the Sectional Disturbance.

[Note by Editor. Unusual difficulties were experienced in reducing rotation periods for Jovian features in the South Equatorial Belt South, in the north part of the South Equatorial Belt Zone, and on the south edge of the South Equatorial Belt North. Mr. Budine is hence making a further study of drifts in these regions. It is expected that tabulated results and rotation periods for these latitudinal currents will appear in our next issue, Vol. 21, Nos. 3-4.]

S. Equatorial Current (N. edge SEB_n, S. part EZ), System I

No.	Mark	Limiting Dates	Limiting L.	L.	Transits	Drift	Period
1	Dc	Feb. 7 - Apr. 26	19° - 15°	--	5	-1°.5	9:50:28
2	Wc	Dec. 10 - May 1	98 - 96	98°	4	-0.4	9:50:29
3	Wc	Oct. 22 - Apr. 29	135 - 129	131	7	-0.9	9:50:29
4	Dc	Oct. 22 - Apr. 13	139 - 140	139	4	+0.2	9:50:30
5	Dc	Nov. 24 - Apr. 13	151 - 155	153	5	+0.8	9:50:31
6	Wc	Dec. 10 - Apr. 13	160 - 160	160	3	0.0	9:50:30
7	Dc	Nov. 24 - Apr. 2	192 - 195	193	6	+0.7	9:50:31
8	Wc	Nov. 24 - Apr. 30	195 - 196	195	3	+0.2	9:50:30
9	Wc	Dec. 4 - May 27	238 - 235	236	8	-0.5	9:50:29
10	Wc	Nov. 13 - May 25	274 - 271	272	9	-0.5	9:50:29
11	Wc	Jan. 10 - May 23	310 - 313	311	5	+0.7	9:50:31
12	Wc	Feb. 4 - May 23	320 - 320	320	6	0.0	9:50:30

Mean rotation period: 9:50:30

N. Equatorial Current (S. edge NEB, N. part EZ), System I

No.	Mark	Limiting Dates	Limiting L.	L.	Transits	Drift	Period
1	Dc	Nov. 10 - June 6	12° - 17°	12°	17	+0°.7	9:50:31
2	Wc	Oct. 10 - June 13	25 - 32	25	21	+0.8	9:50:31
3	Dc	Sept. 19 - June 20	34 - 43	43	45	+0.7	9:50:31
4	Dc	Nov. 17 - June 5	53 - 49	51	25	-0.8	9:50:29
5	Wc	Sept. 19 - June 4	67 - 61	68	18	-1.5	9:50:28
6	Dc	Oct. 28 - June 20	71 - 73	72	17	+0.3	9:50:30
7	Dc	Nov. 6 - June 20	77 - 78	76	23	+0.1	9:50:30
8	Wc	Feb. 4 - May 17	79 - 84	--	11	+1.5	9:50:32
9	Dc	Oct. 29 - May 10	86 - 87	82	16	+0.1	9:50:30
10	Dc	Oct. 6 - May 10	89 - 90	89	22	+0.1	9:50:30
11	Dc	Oct. 6 - May 17	93 - 92	93	15	-0.1	9:50:30
12	Wc	Dec. 3 - May 19	105 - 94	102	19	-2.0	9:50:27
13	Dc	Sept. 22 - May 24	112 - 107	110	17	-0.6	9:50:29
14	Wc	Oct. 29 - May 1	112 - 112	112	19	0.0	9:50:30
15	Dc	Oct. 29 - Apr. 29	120 - 118	118	27	-0.3	9:50:30
16	Wc	Oct. 29 - Apr. 29	125 - 120	123	7	-0.8	9:50:29
17	Wc	Dec. 26 - Apr. 29	129 - 128	128	15	-0.2	9:50:30
18	Wc	Oct. 6 - Apr. 29	132 - 130	131	19	-0.3	9:50:30
19	Dc	Oct. 22 - Apr. 29	141 - 136	138	11	-0.8	9:50:29
20	Wc	Oct. 29 - Apr. 29	143 - 139	141	9	-0.7	9:50:29
21	Dc	Oct. 22 - Apr. 15	146 - 142	146	20	-0.7	9:50:29
22	Wc	Oct. 23 - Apr. 29	150 - 150	150	16	0.0	9:50:30
23	Dc	Oct. 25 - June 16	156 - 153	154	19	-0.4	9:50:29
24	Wc	Nov. 6 - June 16	163 - 163	163	11	0.0	9:50:30
25	Wc	Nov. 9 - May 22	162 - 168	167	18	+0.9	9:50:31
26	Dc	Oct. 29 - Mar. 19	169 - 171	170	17	+0.4	9:50:31

No.	Mark	Limiting Dates	Limiting L.	L.	Transits	Drift	Period
27	Wc	Dec. 10 - May 22	177° - 173°	176°	13	-0°.7	9:50:29
28	Wc	Nov. 24 - May 22	182 - 177	179	26	-0.8	9:50:29
29	Dc	Dec. 13 - June 16	185 - 182	184	33	-0.5	9:50:29
30	Wc	Sept. 18 - Apr. 29	190 - 192	192	24	+0.3	9:50:30
31	Dc	Oct. 16 - May 20	202 - 201	202	36	-0.1	9:50:30
32	Wc	Dec. 13 - Apr. 2	201 - 203	202	11	+0.5	9:50:31
33	Dc	Oct. 16 - Mar. 31	205 - 207	207	19	+0.4	9:50:31
34	Dc	Dec. 13 - May 27	213 - 211	211	18	-0.4	9:50:29
35	Wc	Nov. 24 - May 27	218 - 216	216	24	-0.3	9:50:30
36	Wc	Feb. 11 - June 5	231 - 224	---	14	-1.8	9:50:28
37	Wc	Feb. 20 - May 27	232 - 229	---	13	-0.9	9:50:29
38	Dc	Nov. 13 - May 27	233 - 236	234	20	+0.5	9:50:31
39	Wc	Sept. 11 - May 27	240 - 239	238	13	-0.1	9:50:30
40	Dc	Sept. 11 - May 25	259 - 258	257	30	-0.1	9:50:30
41	Wc	Nov. 13 - June 30	262 - 268	266	11	+0.8	9:50:31
42	Dc	Nov. 13 - May 20	266 - 268	267	24	+0.3	9:50:30
43	Wc	Nov. 13 - Mar. 26	274 - 269	272	9	-1.2	9:50:28
44	Dc	Oct. 15 - May 18	283 - 281	282	27	-0.3	9:50:30
45	Dc	Nov. 13 - May 25	290 - 296	293	29	+0.9	9:50:31
46	Dc	Oct. 2 - Apr. 14	314 - 309	310	29	-0.8	9:50:29
47	Wc	Oct. 2 - June 8	315 - 312	314	12	-0.4	9:50:29
48	Dc	Oct. 2 - May 23	321 - 320	321	13	-0.1	9:50:30
49	Wc	Nov. 20 - Apr. 12	328 - 328	328	23	0.0	9:50:30
50	Dc	Nov. 23 - Mar. 29	336 - 341	339	34	+1.4	9:50:32
51	Dc	Jan. 24 - June 15	345 - 345	---	24	0.0	9:50:30
52	Wc	Jan. 24 - June 15	347 - 353	---	15	+1.3	9:50:32
53	Wc	Oct. 6 - June 6	28 - 39	29	23	+1.3	9:50:32
				Mean rotation period:			9:50:30

The most remarkable features in the N. Equatorial Current were as follows:

No. 4 was a very dark "Hook" projection observed on the south edge of the NEB.
No. 19 was a dark major projection located on the south edge of the NEB.
No. 26 was a very dark major projection observed on the south edge of the NEB.
No. 27 was a very bright major white spot observed in the northern part of the EZ.
No. 30 is a very large irregular white area observed in the northern part of the EZ.
No. 31 was the most prominent feature observed on the south edge of the NEB. It was observed during the entire apparition. Patrick Moore called it "a very prominent big projection, which I call the Smokestack". It was observed regularly by Rost, Moore, Shartle, and Stewart.
No. 39 was a very brilliant white oval located on the south edge of the NEB.
No. 42 was another "smokestack" type projection, tall and dark, observed on the south edge of the NEB. It was observed very well by Stewart, Larkin, Farrell, Moore, Pollak, Rost, and Budine.
No. 44 was a very dark tall projection located on the south edge of the NEB. It was observed often by Shartle, Larkin, and Pollak.
No. 45 was a large shaded spot observed in the northern part of the EZ. Observers who observed this feature well were Stewart, Shartle, Larkin, Rost, and Pollak.
No. 50 was a dark major projection located on the south edge of the NEB.

Middle of N. Equatorial Belt, System II

No.	Mark	Limiting Dates	Limiting L.	L.	Transits	Drift	Period
1	Dc	Nov. 13 - Apr. 14	80° - 18°	47°	4	-12°.2	9:55:24
2	Wc	Nov. 13 - Apr. 26	87 - 15	55	6	-13.1	9:55:23
3	Wc	Feb. 4 - Mar. 14	61 - 39	--	3	-17.0	9:55:17
4	Wc	Feb. 13 - Apr. 2	72 - 47	--	4	-14.7	9:55:21
5	Wp	Feb. 4 - Apr. 2	86 - 58	--	3	-14.8	9:55:20
6	Wc	Dec. 3 - May 25	125 - 37	106	7	-15.2	9:55:20
7	Wc	Nov. 26 - May 23	189 - 81	163	7	-18.0	9:55:16
8	Wp	Jan. 24 - Apr. 8	280 - 249	---	7	-12.4	9:55:24
9	Wf	Dec. 4 - Apr. 13	315 - 252	298	10	-14.3	9:55:21
10	Wp	Jan. 24 - Apr. 6	304 - 262	---	7	-17.5	9:55:17

No.	Mark	Limiting Dates	Limiting L.	L.	Transits	Drift	Period
11	Wc	Jan. 19 - Apr. 30	317° - 236°	317°	12	-23°8	9:55:08
12	Wf	Feb. 12 - Apr. 6	314 - 269	---	9	-25.0	9:55:06

Mean rotation period: (without Nos. 11 and 12) 9:55:20
Mean rotation period: (Nos. 11 and 12) 9:55:07

Most of the objects in the table were located somewhat north of the middle of the NEB. No. 2 was a very bright white rift observed in the middle of the NEB. Nos. 8-12 were bright white objects observed very well by Shartle, and most of the data in the table is based on his transits.

N. Tropical Current (N. edge NEB, NTrZ), System II

No.	Mark	Limiting Dates	Limiting L.	L.	Transits	Drift	Period
1	Dc	Oct. 22 - Feb. 6	55° - 11°	26°	11	-12°0	9:55:24
2	Wp	Oct. 29 - Apr. 28	62 - 350	43	20	-12.0	9:55:24
3	Wc	Oct. 22 - Apr. 28	66 - 354	45	35	-13.0	9:55:23
4	Wf	Oct. 22 - Apr. 28	72 - 359	48	23	-11.6	9:55:25
5	Dc	Oct. 22 - Apr. 26	84 - 31	66	19	- 8.4	9:55:29
6	Wc	Oct. 22 - Apr. 26	101 - 12	83	22	-14.1	9:55:21
7	Wp	Nov. 13 - Apr. 21	105 - 37	95	17	-12.6	9:55:24
8	Wc	Nov. 13 - Mar. 4	109 - 84	101	15	- 6.6	9:55:32
9	Wc	Jan. 2 - May 1	137 - 18	119	17	-29.7	9:55:00
10	Dc	Oct. 16 - May 25	181 - 23	126	22	-24.7	9:55:07
11	Wc	Jan. 1 - May 25	146 - 32	130	12	-23.3	9:55:09
12	Dc	Oct. 16 - May 1	195 - 57	134	14	-20.9	9:55:12
13	Wc	Jan. 1 - Apr. 29	159 - 76	142	11	-28.6	9:55:02
14	Dp	Jan. 9 - May 23	149 - 84	---	13	-13.8	9:55:22
15	Dc	Jan. 22 - May 23	146 - 93	---	16	-12.6	9:55:24
16	Df	Feb. 4 - May 23	137 - 101	---	16	- 9.7	9:55:27
17	Wc	Dec. 13 - May 6	176 - 106	165	11	-14.3	9:55:21
18	Wc	Dec. 21 - May 23	200 - 105	187	7	-18.3	9:55:16
19	Wc	Nov 24 - Jun. 4	244 - 127	199	14	-11.7	9:55:25
20	Wp	Dec. 26 - May 14	232 - 184	221	8	-10.2	9:55:27
21	Wc	Dec. 4 - May 14	253 - 187	227	13	-12.2	9:55:24
22	Dc	Dec. 4 - Apr. 30	273 - 211	248	14	-12.7	9:55:23
23	Wp	Nov. 5 - May 21	300 - 204	263	14	-14.8	9:55:20
24	Wc	Nov. 19 - May 19	298 - 209	269	25	-13.9	9:55:22
25	Wf	Nov. 9 - May 19	309 - 211	273	11	-15.3	9:55:20
26	Wp	Dec. 4 - Apr. 30	325 - 250	301	23	-15.3	9:55:20
27	Wc	Jan. 3 - Apr. 30	312 - 252	304	24	-15.4	9:55:20
28	Wf	Jan. 17 - Apr. 30	310 - 254	308	14	-16.0	9:55:19
29	Wp	Jan. 3 - Feb. 22	319 - 291	313	6	-16.5	9:55:18
30	Wc	Jan. 10 - Apr. 6	318 - 269	315	11	-16.9	9:55:18
31	Wf	Jan. 3 - Apr. 6	323 - 275	317	11	-15.0	9:55:20
32	Wp	Jan. 3 - Apr. 23	351 - 314	346	8	-10.0	9:55:27
33	Wc	Jan. 29 - Apr. 23	348 - 317	---	13	-10.7	9:55:26
34	Df	Oct. 22 - Jan. 22	61 - 36	37	9	- 8.1	9:55:30
35	Wc	Dec. 10 - Feb. 19	45 - 24	36	9	- 8.8	9:55:29
36	Wp	Dec. 13 - Apr. 24	137 - 58	115	6	-17.6	9:55:17
37	Wc	Dec. 13 - Apr. 24	140 - 71	122	17	-15.3	9:55:20
38	Wf	Dec. 13 - Apr. 24	144 - 77	127	8	-14.9	9:55:20
39	Wc	Dec. 21 - Mar. 27	213 - 155	193	6	-17.6	9:55:17

Mean rotation period: (without Nos. 9-13) 9:55:23
Mean rotation period: (Nos. 9 - 13) 9:55:06

The outstanding feature of the N. Tropical Current was a group of spots moving very rapidly in decreasing longitude compared to other objects in the current. While it is not unusual for one or two spots in this current to possess periods as short as 9:55:07 (No. 10) or 9:55:09 (No. 11), is is rather interesting that Nos. 9 - 13 are all shorter than 9:55:13. In fact No. 9 has apparently tied the record of 9:55:00 as set by a feature on January 26, 1943 (see The Planet Jupiter, by B. M. Peek, p. 86).

Nos. 9 and 13 are the shortest periods ever observed by ALPO members of objects in this current, to my knowledge in checking past apparitional reports. In 1955-56 two objects gave a period of 9:55:03, and in 1961-62 one object had a period of 9:55:05.

No. 9 was the fastest feature in rotation period. It was a bright, small oval located on the north edge of the NEB and was observed well by Rost, Shartle, and Moore. No. 10 was a very dark spot observed on the north edge of the NEB. It was observed well by Moore, Farrell, Rost, Pollak, and Budine. No. 11 was a bright small oval located on the north edge of the NEB. No. 12 was a very dark spot on the north edge of the NEB. No. 13 was a very bright nodule which formed a notch in the north edge of the NEB.

Other features of the N. Tropical Current were as follows: Nos. 2, 3, and 4 was a bright white gap in the north edge of the NEB which protruded into the NTrZ, forming a large white oval. It was one of the best observed features of the N. Tropical Current. Observers who observed it regularly were Shartle, Moore, and Pollak. Nos. 7 and 8 was a large white notch on the north edge of the NEB. Nos. 14, 15, and 16 was an outstanding feature. It was a very dark, elongated projection or "Barge" type feature. It was observed well by Rost, Moore, Shartle, Budine, Stewart, and Thiede. Nos. 20 and 21 was a large white oval on the north edge of the NEB, with a festoon surrounding it. The feature was observed well by Shartle, Mackal, Moore, and Rost. No. 25 was a white elongated oval in the $NTrZ_s$ observed regularly by Shartle, Rost, Larkin, Moore, and Pollak.

N. Temperate Current (NTB, NTeZ), System II

No.	Mark	Limiting Dates	Limiting L.	L.	Transits	Drift	Period
1	Dc	Oct. 29 - Apr. 29	53° - 116°	95°	8	+10°.3	9:55:55
2	Dc	Oct. 29 - Apr. 17	61 - 119	99	6	+10.2	9:55:55
3	Dc	Oct. 29 - Mar. 26	68 - 131	107	14	+12.9	9:55:58
4	Dp	Oct. 22 - Mar. 24	75 - 139	117	10	+12.3	9:55:57
5	Dc	Oct. 22 - Apr. 3	78 - 151	122	9	+13.3	9:55:59
6	Df	Oct. 22 - Mar. 24	102 - 148	128	6	+ 8.9	9:55:53
7	Dc	Oct. 21 - Mar. 26	105 - 155	133	15	+ 9.5	9:55:54
8	Wc	Dec. 11 - May 19	136 - 244	147	7	+20.0	9:56:08
9	Wc	Dec. 13 - Apr. 29	155 - 253	171	7	+21.2	9:56:10
10	Dp	Nov. 17 - Mar. 23	171 - 277	216	4	+24.7	9:56:15
11	Wc	Nov. 24 - Apr. 21	208 - 337	232	12	+25.8	9:56:16
12	Dp	Nov. 6 - Dec. 11	291 - 320	---	4	+22.3	9:56:11
13	Dp	Feb. 1 - Mar. 16	341 - 20	---	5	+26.0	9:56:16
14	Dc	Jan. 29 - Mar. 19	348 - 27	---	9	+22.9	9:56:12
15	Df	Jan. 29 - Mar. 16	352 - 27	---	5	+21.8	9:56:11

Mean rotation period: (without Nos. 8 - 15) 9:55:56
Mean rotation period: (Nos. 8 - 15) 9:56:13

No. 3 was a dark section of the NTB with a projection on the south edge of the belt. It was observed best by Farrell, Shartle, and Moore.

No. 10 was the preceding end of an "extra belt" as observed by Patrick Moore.

Nos. 13, 14, and 15 was a darker section of the NTB observed very well by Rost and Shartle.

N.N. Temperate Current (NNTB, NNTeZ), System II

No.	Mark	Limiting Dates	Limiting L.	L.	Transits	Drift	Period
1	Dp	Oct. 29 - May 25	17° - 24°	23°	11	+1°.0	9:55:42
2	Dc	Oct. 28 - May 25	26 - 31	30	20	+0.7	9:55:42
3	Df	Oct. 29 - May 25	33 - 35	34	12	+0.3	9:55:41
4	Wc	Oct. 29 - May 1	45 - 40	43	7	-0.8	9:55:40
5	Dp	Oct. 29 - Mar. 14	49 - 40	45	7	-2.0	9:55:38
6	Df	Oct. 29 - May 1	54 - 43	52	11	-1.7	9:55:38

No.	Mark	Limiting Dates	Limiting L.	L.	Transits	Drift	Period
7	Dc	Oct. 22 - May 1	84° - 71°	73°	13	-2°.3	9:55:37
8	Dc	Nov. 13 - Apr. 29	86 - 79	83	12	-1.2	9:55:39
9	Dc	Nov. 13 - May 23	91 - 81	87	6	-1.6	9:55:38
10	Dp	Dec. 13 - Mar. 26	139 - 132	136	12	-2.0	9:55:38
11	Dc	Dec. 13 - Apr. 15	145 - 140	144	11	-1.9	9:55:38
12	Df	Dec. 13 - Apr. 15	152 - 149	151	14	-0.7	9:55:40
13	Wc	Nov. 24 - Apr. 6	273 - 266	271	9	-1.6	9:55:38
14	Dp	Jan. 10 - Mar. 18	308 - 296	306	6	-5.2	9:55:34
15	Df	Jan. 29 - Apr. 19	342 - 310	---	5	-11.9	9:55:24
16	Dc	Jan. 10 - Apr. 9	349 - 329	346	4	-6.7	9:55:31
17	Dc	Jan. 10 - Apr. 9	355 - 331	352	5	-8.0	9:55:30
18	Wp	Feb. 22 - Apr. 2	349 - 337	---	3	-8.6	9:55:29
19	Wc	Feb. 1 - Apr. 2	0 - 340	---	6	-10.0	9:55:27
20	Wf	Feb. 22 - Apr. 2	358 - 343	---	7	-10.7	9:55:26
21	Dc	Dec. 13 - May 14	191 - 184	187	8	-1.4	9:55:39
22	Dc	Dec. 4 - May 29	319 - 298	314	11	-3.4	9:55:36
23	Dp	Nov. 21 - Mar. 18	282 - 273	278	5	-2.3	9:55:37
				Mean rotation period:			9:55:36

The activity during 1966-67 in latitudes north of the North Temperate Belt was very remarkable. The prominent features of the N. N. Temperate Current were as follows:

Nos. 1, 2, and 3 was a long dark rod on the $NNTB_n$ observed very well by Moore, Shartle, Farrell, Pollak, and Budine.

No. 7 was a very dark knot in the NNTB observed best by Moore and Farrell.

Nos. 10, 11, and 12 was a dark elongated condensation located on a darker section of the NNTB. This feature was observed extremely well by Stanley Shartle, and the data in the table are mostly a result of his transits.

No. 13 was a very brilliant nodule located on the south edge of the NNTB. It was observed mostly by Farrell, Stewart, and Budine.

Nos. 16 and 17 were very dark condensations embedded in the NNTB.

Nos. 18, 19, and 20 was a very bright oval located in the $NNTeZ_n$ observed regularly by Shartle.

No. 23 was the preceding end of a rod located on the $NNTB_n$ observed well by Moore, Larkin, Farrell, and Shartle.

N.N.N. Temperate Current (NNNTB, NNNTeZ), System II

No.	Mark	Limiting Dates	Limiting L.	L.	Transits	Drift	Period
1	Dc	Dec. 10 - Apr. 26	86° - 21°	66°	3	-14°.1	9:55:21
2	Dc	Oct. 8 - May 1	115 - 29	77	5	-12.5	9:55:24
3	Dc	Oct. 8 - May 1	130 - 42	86	4	-12.8	9:55:23
4	Dc	Dec. 13 - May 1	157 - 62	138	4	-20.2	9:55:13
5	Dc	Nov. 24 - Feb. 7	275 - 252	260	3	- 8.9	9:55:28
6	Dc	Nov. 24 - Mar. 25	290 - 235	272	4	-13.4	9:55:22
7	Dc	Nov. 20 - Apr. 30	332 - 245	302	4	-16.1	9:55:19
8	Dc	Nov. 20 - Apr. 30	340 - 256	311	7	-15.6	9:55:19
9	Wc	Oct. 8 - Mar. 19	114 - 29	58	5	-15.7	9:55:19
10	Wc	Oct. 8 - May 1	117 - 34	80	4	-12.0	9:55:24
11	Dc	Jan. 9 - Mar. 12	159 - 120	154	5	-18.6	9:55:15
12	Wc	Nov. 24 - Feb. 9	218 - 182	191	3	-13.3	9:55:23
				Mean rotation period:			9:55:21

Most of the features in this far northern latitude were in the form of dark sections and rods. No. 3, however, was a very dark small condensation on the NNNTB observed well by Pollak, Farrell, and Budine.

Every feature in the NNN Temperate Current table was observed by Joanne Farrell, and it is mainly through her observations that the table is available and the information gained. Nos. 2, 3, 4, 7, and 8 were confirmed by Moore, Pollak, and Budine.

<u>Comments by the Recorder</u>: The 1966-67 apparition of Jupiter was to my knowledge

the most active and fruitful to date. While we had only 22 observers compared to 52 observers in 1962-63, which was our high, we did set a new record for transits - 7,180 transits compared to 5,466 in 1962-63, which was the previous record. Keep up those fine contributions to the Jupiter Section!

In closing, I would like to say "many thanks" to each one of you for your fine contributions to the "Rotation Period Report". Particularly I would like to say a special thank you to the following observers: to Patrick Moore for his large, excellent, and accurate report of transits, which proved very valuable to the Jupiter Section; to Stanley Shartle for his large, excellent, and neat report of central meridian transits; to Carlos Rost for his high quality report of transits; to our other foreign observers for their contributions, namely Alan Heath, Bob Hicks, and E. C. Melville; to Joanne Farrell for her large fine record contributions with modest apertures and for her valuable transits of the South Tropical Zone Disturbance; to Kip Larkin for his fine contributions; and to Charles Pollak for his valuable early apparition contributions. The total contribution from the Binghamton observers was 3,192 transits!

Many thanks again to each observer who contributed, and I hope to see your observations in the next "Rotation Period Report". Also, I am extending an invitation to all observers to contribute to the Jupiter Section.

BULLETIN OF ALPO LUNAR SELECTED AREAS PROGRAM

By: Charles L. Ricker, A.L.P.O. Lunar Recorder

Mr. William B. Chapman, of NASA, has called our attention to the following formations in the ALPO Selected Areas Program, and he suggests that we place them under constant surveillance during these critical dates in 1968.

Messier-Pickering	May 3, 4, 5, 6, and 7 June 1, 2, 3, 4, and 5
Plato, Kepler, and Aristarchus	May 12 June 6, 7, 8, 9, and 10 July 4, 5, 6, 7, and 8

The following observational guidelines are suggested:

Each observer should select for study the formations with which he is most familiar because it will be in his often-studied areas that a short-lived change will be most readily detected.

If a change in appearance is definitely detected, the U.T. must be recorded when it is first seen and again when it disappears. The location of the affected area must also be recorded.

By assigning two or more hours of observing time to each date an individual observer can be assured of making a valuable contribution to this investigation. Again, the U.T. must be recorded at the beginning and end of each nightly observing period.

The standard observing form can be used in this project, and the use of the designated filters is recommended.

It is emphasized that in a project such as this one, all data, both positive and negative, are of equal value. Therefore, every contribution will be of much importance in the final analysis.

Good luck, good seeing, and good transparency.

Note by Editor. Perhaps the chief trouble with the preceding article is that many of the critical dates will be past before this issue reaches our readers! The Editor regrets the delay and will be glad for as many members as possible to examine the suggested areas on the critical dates. Also, Lunar Recorder Ricker would welcome an expression of reader interest in bulletins like the foregoing one. Perhaps such bulletins could be sent regularly to prospective observers interested in the systematic coverage of Lunar Transient Phenomena.

THE SIGNIFICANCE OF THE TRIPLE-POINT OF WATER FOR THE INTERPRETATION OF OBSERVED MARTIAN PHENOMENA

By: Eugene W. Cross, Jr.

In recent years, several investigators[1-9] have proposed chemical and geological hypotheses to account for the seasonal variations in the appearance of the Martian maria and canals.[10-14] Apparently, these investigators are of the opinion that the environmental conditions which exist on the Martian surface are too rigorous to allow the existence of varieties of vegetation or other forms of life which would be capable of producing the observed phenomena, although water vapor has been found in the Martian atmosphere.[15-18] However, of the factors which govern life processes, the most important would appear to be the existence of H_2O in the liquid phase. It is worthwhile to note that in any natural terrestrial environment where H_2O liquid is present, life is present also. There is no reason to assume that this dual occurrence principle does not apply on other worlds. In 1967, C. W. Tombaugh proposed that the correct interpretation of Martian phenomena might hinge on the triple point of water.[19,20]

The minimum temperature and pressure at which H_2O liquid may exist is related to the triple point of H_2O, where the triple point is defined as the unique temperature and pressure at which H_2O may exist as a gas, liquid, and solid. For water, the triple point is a temperature of 0.16°C and a pressure of 6.10 millibars.[21] (The sea level atmospheric pressure on Earth is about 1013 millibars.)[22] At a pressure of less than 6.10 millibars, H_2O can exist only as a solid and/or a gas, depending on the temperature.

The results of spectrographic studies and the Mariner IV occultation experiment indicate that the atmospheric surface pressure of at least some areas of Mars is of the order of 10-7 millibars.[17,18,23] Temperature measurements by W. M. Sinton (1954) show that within a few degrees of longitude or latitude of the sub-solar point on Mars, the temperature of the Martian surface may be as warm as 26-28°C.[24] Indeed, parts of the Martian surface within 10° latitude north or south of the sub-solar point appear to remain above 0.0°C for a period of about four hours during the Martian day. For the maria, which are habitually warmer than the bright deserts, the "temperate" zone just described might be extrapolated to include areas 10-50° latitude north or south of the sub-solar point, although the maria 40-50° of latitude from the sub-solar point probably do not remain above 0.0°C for more than a fraction of an hour during a single Martian day.

It is obvious that if a temperature and pressure of 0.16°C and 6.10 millibars, respectively, are a common occurrence on the Martian surface, as the best available data indicate, it may also be quite common for H_2O liquid to occur on the Martian surface through some type of moisture transfer from the atmosphere, as Slipher postulated (and perhaps observed!)[25], or from H_2O liquid and vapor escaping from the planet's interior as the result of geothermal activity.[26] Thus, if a corollary with Earth is drawn from the presence of Martian surface water, Martian life is to be expected.

The foregoing theory makes four predictions:

(1) The maria and canals are lowlands.[27-31] The atmospheric pressure at the surface of the maria is greater than 6.10 millibars.

(2) The green and blue colors, and seasonal variations of the maria and canals[11-13] are due to the presence of some form of life.[12,19,20,26,28,29,31-33]

(3) The canals are biological expressions of fault zones in the planet's crust.[20,26,29,31] Such fault zones result from shattering of the crust by the force of impact of planetoidal fragments striking the surface and producing craters;[20,27-30] downthrown land masses near faults result in graben.[31] Life forms (probably vegetal) are postulated as finding the fault zones more favorable for life due to the lower elevations of the walls and floors of graben, hence greater atmospheric density, and/or the escape of heat, H_2O liquid and vapor, and CO_2 gas, due to geothermal activity.

(4) The terrae, or deserts, are highlands[19,20,30] at such elevations that the atmospheric pressure at the surface is always below 6.10 millibars, and, consequently, except in areas where geothermal discharges temporarily alter the normal environment, life forms which are present in the lowlands cannot survive in the highlands.

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(Abbreviations: A. J. = Astronomical Journal; Ap. J. = Astrophysical Journal; Pub. A. S. P. = Publications of the Astronomical Society of the Pacific.)

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SPRING'S CIRCUMPOLAR COMET, 1967n

By: Dennis Milon, Comets Recorder

Early ALPO observations of Comet 1967n in January were reported in the last issue of this Journal, page 209. During February, March, and April, 1968, many more reports were received as Ikeya-Seki reached maximum brightness and developed a ½° tail. Also, variations from the predicted magnitude made interesting watching.

Two mailings to Comets Section members were made. The first, on March 20th, was a Xerox copy of the circumpolar map from the Smithsonian Astrophysical Observatory Star Chart, upon which observers were requested to identify their comparison stars. As the comet's path crossed this chart, accurate photovisual magnitudes were obtained from the 1941 Carnegie publication "Magnitudes and Colors of Stars North of +80°" by F. H. Seares, F. E. Ross, and M. C. Joyner. These magnitudes are more accurate than the SAO catalog values, but the SAO was used for cross-referencing since the SRJ catalog is arranged by Durchmusterung number in 1900 coördinates. Thus, stars were first measured for position in the Atlas Borealis and were then found in the SAO catalog.

The second announcement card reported an abrupt fading on about March 24th observed by Robert Buecher, Karl Simmons, and the Recorder.

The following contributed observations of Comet Ikeya-Seki 1967n:

Carl Anderson
John Bortle
Robert Buecher
Charles Capen
Kenneth Delano
Bill Grady
Thomas P. O'Hara
A. Kunert
Russ Maag
Vic Matchett
Michael McCants
Tom Middlebrook
Martin P. Miller
R. B. Minton
Jimmy L. Mitchell
Tony Preslar
Logan Rimes
Karl Simmons
Wayne Wooten

The Tail. Before the comet became circumpolar in March, a visual tail was sighted by Simmons while observing 40 miles southeast of Tucson, Arizona, on February 24th, UT. Easy with averted vision in a 12½-inch, the slender ray was 1' wide at the coma and extended westward about 25'. When corrected for foreshortening, this length is two million miles at the comet's distance of 1.451 astronomical units from Earth. Simmons states that the naked eye limiting magnitude was 6½ or 7, illustrating that amateurs need to travel away from cities to see such delicate comet tails. Eight days later Thomas P. O'Hara, observing from Mount Pinos in California, could see the comet 45' long and 35' wide in a 6" RFT. On the next night, March 4th, Chick Capen at the Table Mountain Observatory, Wrightwood, California, saw a visual tail over 1° long in binoculars. With an estimated magnitude of 7, the comet was even noted with the naked eye by averted vision. A photographic tail not more than ½' wide was recorded on March 25th and 26th by John Bortle and Charles Scovil, using the 22-inch Maksutov at Stamford Observatory in Connecticut. Referring to Bortle's sketch reproduced here (Figure 13), there is a nuclear condensation of 0'.5 diameter, a central condensation of 1'.3, and a total coma diameter of 2'.5.

<u>The Coma</u>. Although only a few persons reported the tail, many described an elongated coma, which sometimes contained a central condensation and nucleus. Typical is the summary by Logan Rimes of Houston, Texas. From his 13 observations with 4¼-inch (35X) and 6-inch (40X) reflectors, he writes, "The comet had a central condensation at every observation, becoming more pronounced near the end of February. At first the comet appeared fan-shaped, then became oval, and near the beginning of March was very elongated."

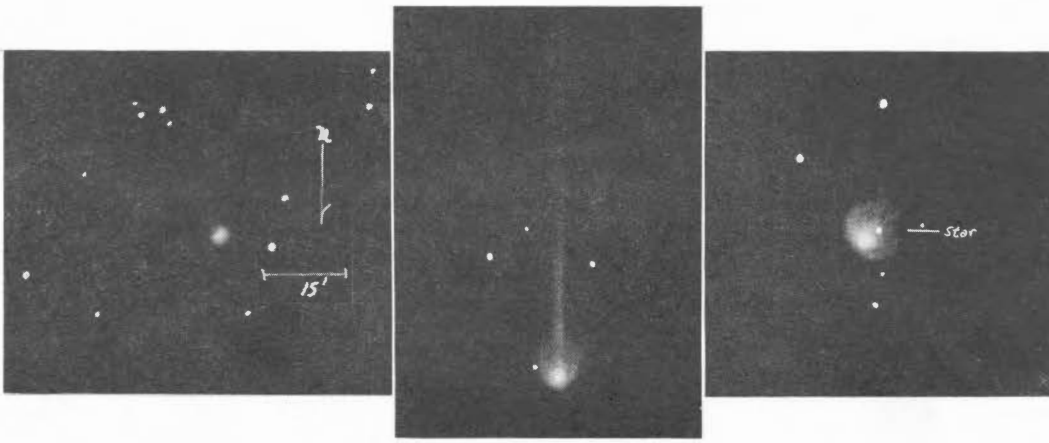

Figure 13. Left: drawing of Comet Ikeya-Seki 1967n by John Bortle on March 25.18, 1968, U.T. with a 6-inch RFT. The star DM 79°515 is seen through the coma. Center: sketch by John Bortle from a photograph taken with a 22-inch telescope and 103aF emulsion on the same date, March 25. Right: sketch from a photograph on March 28, 1968, with a measured coma of 2'.8 by 3'.2.

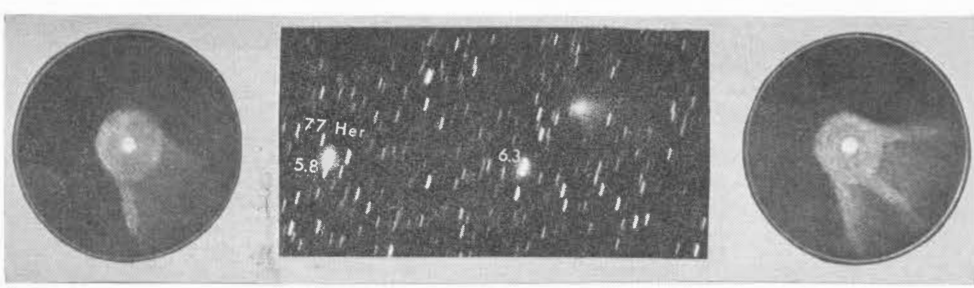

Figure 14. Observations of Comet Ikeya-Seki 1967n by Charles F. Capen, Table Mountain Observatory. Center: photograph with a 135-mm. lens on March 4.5, 1968, U.T. The camera was guided on the comet for one hour. The visual sketches on March 3.5 (left) and March 4.5 were made with binoculars and a 24-inch Cassegrain at 390X. The nucleus was about 1" in diameter. North is at the top in all three views.

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As comets approach the sun a nucleus usually becomes visible. When did the nucleus of Ikeya-Seki first look stellar? The reports are not too clear on this point, but the estimates of the degree of coma condensation in February range from 4 to 7 (0 is diffuse, 9 stellar). Tom Middlebrook, Nacogdoches, Texas, saw a 12th-magnitude stellar nucleus early in February. On the 4th Wayne Wooten at Gainesville, Florida, estimated that the nucleus was magnitude 8.5.

During February, 1968 the reported coma diameter was usually 5' or less. On February 26th Carl Anderson of Manchester, New Hampshire, timed the comet to pass a reticle in his 10-inch reflector, obtaining 3'. On the same date Bortle and Kenneth Delano, Taunton, Massachusetts, agreed that the central condensation was about 1'. Delano found the total diameter to be about two-thirds the diameter of M13 and equal to that of M92 in 10X40 binoculars on the 22nd.

Throughout March most observers noted a central condensation offset toward the southeast, even when a tail was not seen.

The coma appeared bluish to R. B. Minton on March 19th when he used his $4\frac{1}{4}$" RFT after one full hour of dark adaptation. Bortle had faintly noted the same tinge on February 26th.

On March 25th Bortle watched the nuclear condensation pass 10 seconds of arc from a star. By estimating the star's magnitude seven times, he found that no certain dimming by the coma occurred. When it was still very close to the pole, on April 3rd, Ikeya-Seki nearly vanished in front of a 7.7-magnitude star, as seen by Milon in a 4-inch.

Brightness. As predicted, the comet was brightest in March, 1968 at 7th magnitude. Near the end of March a decline in brightness occurred, according to some observers. Accompanying this possible dimming, the central condensation became less noticeable on about the 25th or 26th, having a scale value of 2 assigned by Simmons on March 28th and 29th, then 0 on the 30th. On March 31st a one-day rise in magnitude took place, and Milon thought that most of the comet's light came from the stellar nucleus. On the same date Delano called the coma condensation 7; Bortle, 6.

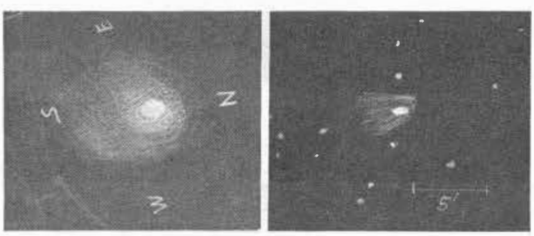

Figure 15. Left: sketch of Comet Ikeya-Seki 1967n by Kenneth Delano on March 4, 1968 with a 12.5-inch reflector. Note the elongated coma with a bright condensation. The coma diameter was 7'. Mr. Delano used binoculars to estimate the magnitude at 7.6 through comparison with the AAVSO U Herculis chart. Right: sketch by Russ Maag on March 7, made with a 6-inch reflector at St. Joseph, Missouri. Note the similar appearance.

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Not agreeing to the magnitude changes just discussed are Bortle and Delano, who both used AAVSO chart fields some distance from the comet. Instead, Bortle's binocular observations indicate a slow drop of half a magnitude between March 20th and 30th, and Delano's show the brightness steady at about 7.9 (in binoculars) from March 25th to April 2nd.

Figure 16. Photograph of Comet Ikeya-Seki 1967n by its co-discoverer, Mr. Tsutomi Seki, on March 3.77090, 1968, U.T. with a 15-cm., f:6.3 Newtonian equipped with an Asahi Pentax SP camera. Used Tri-X film, exposed for five minutes, and developed for 18 minutes in DK-50 at 20°C. Mr. Seki measured the position as 17 hrs., 17 mins., 12.33 secs. and +47°24'55".2 and reported the magnitude as 7.2. North is at the top, and the field is one-half degree across.

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The lunar eclipse of April 13, 1968 was a good opportunity for estimates; and four were made: Martin P. Miller (Orosi, Calif.), 7.5, 6"; Douglas Smith (Vinton, Va.), 8.9, 6"; Bortle, 7X50, 8.0; Milon, 9.2, 4".

NEW COMET 1968a

By: Dennis Milon, ALPO Comets Recorder

The first comet discovery of 1968 is credited to five Japanese observers, who all saw

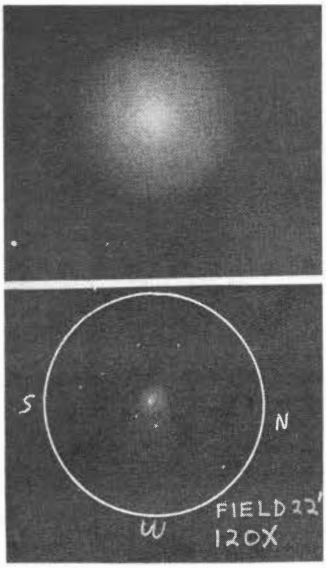

Figure 17. Between January 12 (top) and February 6, 1968 Comet Ikeya-Seki 1967n developed a sharp nucleus, as illustrated in these drawings by R. B. Minton and Tom Middlebrook. The scales are not the same.

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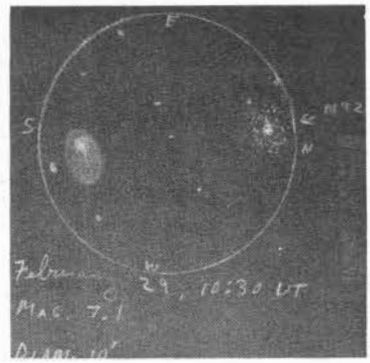

Figure 18. Drawing of Comet 1967n by Logan Rimes when it was just south of M92 on February 29, 1968. The closest approach to M92 came during daylight hours for observers in the United States.

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it on April 30th. According to IAU Circular 2072 they are A. Tago, Y. Sato, M. Honda, S. Fujikawa, and H. Yamamoto. The next observation was telephoned to the Comets Recorder by Michael McCants from Austin, Texas. He and Don Wells found the comet with a 10-inch reflector after receiving an IAU telegram. Their position was May 1.441 Universal Time, right ascension $0^h22^m.4$, declination +38° 16'. The magnitude was 7, coma diameter 3', and degree of condensation 3. The SAO Chart was used for position.

Moving 4° per day, the comet passed close to M31 the next morning when R. B. Minton, Las Cruces, New Mexico, estimated the magnitude at 7.6 in his $4\frac{1}{4}$-inch RFT, using the SAO catalog. From a photo* with an f/6 Aero Ektar, he plotted the position at $0^h35^m.9$, +42° 16' for a time of May 2.44. On the same morning McCants and Wells found the comet similar in appearance to their first observation, and determined the position as $0^h35^m.7$, +42° 12' at May 2.432, UT.

On May 4.45 Mr. Minton observed with the 24-inch reflector of New Mexico State University. With a power of 500X he could not see a nucleus. The position was 1^h06^m, +48° 52'.

BOOK REVIEWS

The Craters of The Moon, by Patrick Moore, F.R.A.S., F.R.S.A. and Peter J. Cattermole, F.R.A.S., F.G.S. Published by W. W. Norton and Co., 1967, 160 pages. Price $5.95.

Reviewed by H. W. Kelsey

Patrick Moore, Director of Armagh Planetarium, and Peter J. Cattermole, Department of Geology, University College of Wales, have combined their knowledge and experience in this comprehensive presentation of selenology. The authors base their selenological conclusions on a procedure which relates geological interpretations to established lunar observational data. This results in an observational study of the creative forces associated with the surface features that are revealable by earth-based telescopes.

A chapter concerning the principles of structural geology is included and is illustrated. This clearly stated information will be of value to the reader who is inexperienced in this scientific field, thereby establishing a better understanding of the terminology that is utilized throughout the book.

*This photograph appears on page 35.

The basic premise of this book is immediately settled by the statement: "It is best, therefore, to stress at once that both the present writers are convinced that for the major walled formations, the basic cause is lunar vulcanism, with other processes (such as meteoritic impact) playing a very minor role." However, the meteoritic theory of lunar crater formation is not ignored; and it is conceded that impact craters must be present on the moon, but it is considered that they are small and relatively unimportant. Non-volcanic and non-meteoritic theories are also discussed. In regard to these the authors state, "Most of these ideas are frankly eccentric." But they also suggest that it is not impossible that the truth of the matter may lie in some other direction than the now popular volcanic and impact theories.

Terrestrial volcanic structures are briefly examined, as well as the volcanic theories of lunar crater origin. Through this approach the reader is conducted into a comparison of terrestrial and lunar structures. Other informative and well written chapters are devoted to these lunar features--the grid system and lunar deformation, maria, mountains, walled formations, linear elements, and the lunar rays. In addition, a chapter is assigned to a discussion of the lunar surface materials.

"Present Volcanic Activity on The Moon?"--with this introductory heading the authors describe the transient sightings that have been recorded, including both the historical and the more recent. The work of Alter, Kozirev, Greenacre and Barr, Sartory, and several others is reviewed. A very comprehensive list of references follows this chapter, as well as each of the others.

Well written and informative, The Craters of The Moon clearly and adequately presents the authors' point of view. The reader will also find the book abundantly illustrated with twenty-seven photographs and forty-five outline drawings. This reviewer recommends it to all serious students of the moon.

The Craters of The Moon is available for circulation in the A.L.P.O. Library.

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The Amateur Astronomer and His Telescope, by Günter D. Roth. Wm. Clowes and Sons Ltd., London and Beccles, England. Distributed in U.S.A. by D. Van Nostrand Co., Inc., Princeton, N. J. 1963. 152 pages, with translation by Alex Helm, F.R.A.S. Price $4.95.

Reviewed by Rodger W. Gordon

This handy little guide for the amateur observer is just the sort of item needed for an amateur who wants to know, "What type?", "How much should I spend?" and "What do I do after I get it?" The author's purpose is to help amateurs choose their instrument and activities with it afterwards.

It is evident, to this reviewer, that Mr. Roth is very opinionated when he describes what instrument to choose for lunar and planetary observing, but no more so than anyone else. He advocates long focus F/10-F/20 reflectors in preference to other types. No doubt this opinion is due to his owning a 4.3-inch Schiefspiegler of long focus, while most American amateurs lean toward F ratios of 6-9 in Newtonian reflectors of 6"-12" aperture. It is true, though, that aperture for aperture an off-axis form of reflector, properly made, is definitely superior to any other type of telescope for lunar and planetary observation, and so the author is perfectly correct in advocating long focus reflectors for this type of work.

After this discussion, we are led to testing the telescope on various objects for different apertures. For owners of refractors, a handy list of chromatic corrections for different focal positions will be found useful (page 49).

A short chapter on "learning to see" follows. This chapter is all too short. A whole book in itself on "learning to see" could be written. Someday someone should gather all the information available on visual perception in astronomical observing and publish it. Mr. Roth does give some useful information regarding this topic, but barely skims the surface.

After this chapter, we are led into the realms of useful work which the amateur observer can tackle. Short chapters on solar, lunar, planetary, meteoric, and photometric techniques are given, along with a brief treatment of astrophotography. A most interesting chapter, though somewhat out of place in a book of this nature, is "Building a Sundial." Several appendix lists of handy information are given at the end of the book. If there is any one adverse criticism that can be made about this book, it is the fact that it is too short. The author has attempted to cover a vast subject in too few pages; as a result, some chapters are uneven and more or less detailed than other equally important chapters.

The translation of the book appears smooth, and no typographical errors were noted. The plates and diagrams are very good in reproduction qualities. Mr. Roth says that Plate XII, on page 65, shows Saturn's Ring D. This assertion is definitely not so. Mr. R. M. Baum's excellent Saturn drawing, made with a $4\frac{1}{2}$" refractor, in reality shows only the outer 2/3 of Ring A darker than the inner 1/3. A beginner might easily be led astray, though it does appear that recent work at Allegheny Observatory confirms the existence of a suspected outer Ring D.

Due to its limitations, this book is not recommended to highly advanced amateurs since they will know the material anyway. It is a good book for an intermediate amateur or for a beginner wanting to know more before specializing.

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The Evolution of Stars, edited with commentary by Thornton Page and Lou William Page. Macmillan, 1968. 334 pp., $7.95.

Reviewed by Kenneth J. Delano

The Evolution of Stars is a selection of 82 carefully abridged articles taken from the pages of Sky and Telescope and from its two predecessors, The Sky and The Telescope, between the years 1935 and 1967. This 6th volume in the series known as the Macmillan Library of Astronomy fulfills its stated purpose "...to inform the public of developments in astronomy that have led to space exploration and space technology." Under the editorship of Dr. Thornton Page, director of the Van Vleck Observatory, and his wife, an accomplished educator and science writer, The Evolution of Stars presents the reader with a good choice of articles with added commentaries which trace the development of ideas concerning the formation, aging, and death of stars.

In the very opening article, written by Bart J. Bok in 1938, we are informed that around 1927 it was commonly believed that our sun, the stars, and galaxies had existed in more or less their present forms for the past 1 to 10 trillion years. Bok wrote: "The past ten years have brought forward several new arguments for the 'short time-scale', which is of the order of 10 billion years. ...The short time-scale allows the universe only one-thousandth as long to reach its present stage of development as did the long time-scale in which most of us believed around 1927. That factor of one-thousandth has made it necessary to abandon our 1927 views on stellar evolution entirely and start over again." The Evolution of Stars documents that new start, and, in the process, introduces the reader to concepts as recent as the neutron stars mentioned in the book's final three articles.

Between Bok's opening article and the closing ones on cosmic X rays and neutron stars, a great mine of stellar information is to be found, arranged in 8 chapters. A 27-page chapter containing 9 articles under the heading "Introduction" is followed by 7 others entitled as follows: Inside the Sun and Stars, H-R and Color-Magnitude Diagrams, The Ages of Star Clusters, Star Formation, The History of Spinning Material, Stellar Explosions, Changes in Chemical Composition, and Peculiarities in the Lives of the Stars. Every article under the various chapter headings is accompanied by the month and year of its original publication; and as a further aid to the reader, the editors offer clear and concise chapter introductions and interspersed commentaries which call attention to any expressions of outdated opinions or findings contained therein.

The articles range in length from one of only four sentences to one by Otto Struve (the principal contributor with 18 articles) which is 12 pages long, although the average article is about 4 pages in length. Care in selecting, arranging, and prefacing the contributions of 20 distinguished authors has resulted in a work that displays greater continuity than one would ordinarily expect from an anthology of magazine articles spanning a 32-year period.

Although the ALPO member will find scarcely more than half a dozen passing references to the subject of planets, he will find The Evolution of Stars an enjoyable and very informative book, and one which he will certainly want to add to his library if he is already the owner of any of the preceeding volumes in the Sky and Telescope Library of Astronomy.

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The Stars Tonight, by John and Cathleen Polgreen. Harper and Row, New York, N. Y., 1967, 87 pages. Price $3.95.

Reviewed by J. Russell Smith

Here's a new book designed for the beginner--one who wants to learn the constellations and view a number of interesting objects as suggested by the authors. The book is by a well-known couple who are not new in the field of writing about astronomy. John is a member of our own ALPO as well as of the AAVSO.

The authors use the first few pages of the book for an explanation of the star charts. They also explain some essential terms such as horizon, zenith, meridian, ecliptic, and zodiac. A good hint is given to the beginner relative to the fact that one must allow time for his eyes to become adapted to the dark before he begins to observe.

The heart of the book is divided into twelve sections--one for each month of the year. Each monthly section is basically composed of a monthly meridian star chart (facing south), a monthly circumpolar star chart (facing north), and several expanded charts of the principal constellations for the month. The text for each month gives interesting facts and legends about the constellations and also points out a number of exciting objects to view with binoculars or a small telescope. There are also a number of photographs of the well-known objects. The authors are aware that the beginner needs information on pronounciation of the names of constellations and stars, and this aid is given after the word the first time it is used in the text.

Following the monthly charts and explanations, the authors give a two page table which will help one find the chart which best shows what stars and constellations are on the meridian at an earlier or later hour than 9:00 P.M. Standard Time--the time used for each monthly chart. The last three pages of the book is a glossary of fourteen items, which appears to be adequate for this volume.

This book is well-done, the charts are excellent, and the charts and text are well adapted to the beginner.

SOUTHWESTERN ASTRONOMICAL CONFERENCE '68 ("ASTRONOMY AT THE CROSSROADS")

By: Robert Starkey, member Astronomical Society of Las Cruces

The Southwestern Astronomical Conference '68, sponsored by the Astronomical Society of Las Cruces, will provide a unique opportunity to combine astronomy and a vacation.

Las Cruces, the Queen City of southern New Mexico--a busy, progressive center of agriculture, science, and industry--contrasts with the sleepy "territorial" town of Mesilla, rich in history and the charm of a bygone era. The rumble of rocketry appears to be an echo of the shots of the gunfighters who lived their time in this lovely land. The rush and roar of the automobile seem less real than the clatter of the horses and the stage in the village square of Mesilla. The shopping center contrasts with the shops there, where the craftsman's wares are on display.

New Mexico State University offers its recreational facilities for your use during your stay. The golf course is one of the finest in southern New Mexico. The swimming pool and tennis courts will also be available.

Various tours will be offered, including tours of two Observatories in the area and a 150-mile tour of the White Sands Missile Range, which will include an evening picnic in the fascinating gypsum dunes of the White Sands National Monument. The $4.50 charge for this tour includes the fare for the air-conditioned bus, the picnic supper, and the National Parks usage fee. Reservations for this tour must be received by August 5 at the latest in order that necessary arrangements to insure transportation can be made. For the economy-minded there will be a $2.00 tour of the White Sands Missile Range only and in buses without air-conditioning, this tour being about 100 miles long. (Most natives recommend air-conditioning in August.)

Other tours are being made available by the Fiesta Travel Agency, arranged to suit your interest and convenience. These should be of special interest to "astronomical widows" and families.

Very reasonable accommodations are available at the University. The cafeteria is offering a meal ticket which provides breakfast, lunch, and dinner on Wednesday, Thursday, and Friday and breakfast and lunch on Saturday, August 24. The cost of these eleven meals is only $10.00, and the ticket may be purchased at the registration desk in Garcia Hall. Garcia Hall, a modern residence hall at New Mexico State University, will be made available, offering single occupancy of a room for $5.00, double occupancy for $3.50 per person, or a two-room suite for a maximum fee of $14.00. Garcia Hall will be the location of many of the conference paper sessions and other activities. The Saturday evening conference banquet will be a buffet style meal to please every taste, costing only $3.50 per person.

The Astronomical Society of Las Cruces has had a very gratifying response to the call for papers, and the program promises to be extremely interesting and informative. The papers and the featured speakers will indeed challenge each attendee.

1. For additional general information about the S.W.A.C. '68, write to:
   Mr. E. R. Casey
   Conference Chairman S.W.A.C. '68
   P. O. Box 921
   Las Cruces, New Mexico 88001

2. For on-campus housing reservations or information about New Mexico State University, write to:
   Director of Housing
   New Mexico State University
   P. O. Box BB
   University Park, New Mexico 88001

3. For off-campus accommodations or travel arrangements, write to:
   Mrs. Doris M. Savedge
   Fiesta Travel
   P. O. Box 1028
   Las Cruces, New Mexico 88001 Phone (505) 526-5577

4. Persons or groups wishing to display non-commercial exhibits should contact:
   Mr. R. B. Minton
   Exhibits Chairman S.W.A.C. '68
   Research Center
   New Mexico State University
   Las Cruces, New Mexico 88001

5. Papers intended to be considered for the program should be mailed to:
   Mr. Walter H. Haas
   Box 3AZ
   University Park, New Mexico 88001

6. Information about registration appears under "Announcements" in this issue.

We hope to see you here!

ANNOUNCEMENTS

Note from the A.L.P.O. Librarian. The Librarian acknowledges with thanks the gift of the book The Fascinating World of Astronomy, by Dr. Robert S. Richardson, from Mr. Eric Peterson of Westmont, Illinois. Mr. Peterson writes: "I would like for everyone to read this book." We do appreciate this gift from Mr. Peterson and would like to remind readers that the Librarian, Mrs. Walter H. Haas, is always happy to receive books which any of our members would like to share with others having the same interests.

Corrections to Vol. 20, Nos. 11-12 of The Strolling Astronomer. Mr. Takeshi Sato has called attention to two errors in his article "The Nature and Origin of the Markings on the Surface of Jupiter: A Morphological Interpretation." On page 181, the 10th line from the bottom, read "dark spots in 1964-7" instead of "dark spots in 1964." On page 186, Figure 5-B, the drawing was made with a magnification of 224X, not 226X as there stated.

Astronomical League National Convention. This year's National Convention of the Astronomical League will be in Chicago on August 30-September 2, 1968, the Labor Day weekend. The Chicago Astronomical Society will be the host society. The Convention Headquarters will be the excellent Hotel Sheraton-Chicago, 505 North Michigan Avenue. General inquiries and communications may be addressed to Mr. Gerald Schultz, 612 West Berkley Drive, Arlington Heights, Illinois 60004. A registration fee of $2.00 per person or $3.00 per family may be mailed to Mr. Sygmund E. Kaye, Convention Treasurer, 6153 South Mozart St., Chicago, Illinois 60629. Exhibit space for any of the many phases of amateur astronomy should be requested from Mr. A. Edward Evenson, 3606 Pheasant Drive, Rolling Meadows, Illinois 60008. Papers in all fields of astronomy are invited. The Program Chairman is Mr. William O. Land, 600 Thames Parkway, Park Ridge, Illinois 60068. Field trips are planned to Dearborn Observatory, to the new Lindheimer Astronomical Research Center at Northwestern University, to the Field Museum of Natural History and its famous collection of meteorites, and to the Adler Planetarium and Astronomical Museum.

The A.L.P.O. is participating in this League Convention; and Mr. Richard E. Wend, our Jupiter Recorder, is coördinating our activities.

Convention of Mid-States Region of the Astronomical League. This meeting will be held on July 19-21, 1968 at Westminster College in Fulton, Missouri. The host is the St. Louis Astronomical Society. Very reasonable meals and dormitory accommodations are available at the college. The registration fee of two dollars per person aged 14 or more or three dollars per family may be sent to Mrs. Winnie Fallert, 448 Hilltrail, Manchester, Mo. 63062. An interesting program of papers is taking shape. The guest speaker will be the famous and delightful Walter Scott Houston, and his subject will be "Test Objects for Summer Skies." Russ Maag will describe League plans for observing the March, 1970 total solar eclipse. Bob Cox is also on the program for an informal (and informative) lecturette on how to make better observing equipment. An in-depth observing session, a field trip to William Woods College in Fulton, a banquet, door prizes, a second Regional Award to an outstanding member of the Mid-States Region, and the election of Region officers for the coming year round out a full, balanced, and appealing program of events. The Regional Chairman, who can furnish additional information, is Mr. Edwin E. Friton, 508 Marshall Ave., Webster Groves, Missouri 63119.

Sustaining Members and Sponsors. As of June 1, 1968, the persons listed below are in these special classes of membership. Sustaining Members pay dues of $10 per year; Sponsors, $25. The excess above the regular rate is used to support the work and activities of the A.L.P.O.

Sustaining Members. Sky Publishing Corporation, Charles F. Capen, Geoffrey Gaherty, Jr., Charles L. Ricker, Alan McClure, Elmer J. Reese, Carl A. Anderson, Gordon D. Hall, Michael McCants, William K. Hartmann, Ralph Scott, A. W. Mount, Charles B. Owens, Joseph P. Vitous, John E. Wilder, Clark R. Chapman, A. K. Parizek, B. Traucki, Frederick W. Jaeger, P. K. Sartory, Nicholas Waitkus, Patrick S. McIntosh, Lyle T. Johnson, the Chicago Astronomical Society, H. W. Kelsey, Phillip Wyman, Harry Grimsley, Daniel H. Harris, Fred M. Garland, the Junior Texas Astronomical Society, David Meisel, Steve Hall, Jack K. Fondren, and Daniel Vukobratovich.

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Registration Card for Southwestern Astronomical Conference '68. There is enclosed in this issue a registration card for the S.A.C.'68, of which the annual Convention of the A.L.P.O. is a part. The card is intended to be self-explanatory (note printing on both sides). Space is provided for registering for yourself or your family and for reserving in advance space on the Convention tours and at the banquet as well as a Convention group photograph and a meal ticket at the New Mexico State University Cafeteria. It is imperative that reservations for the extended White Sands Missile Range--White Sands National Monument tour be received by August 5, 1968 at the latest. The various Convention activities are described by Bob Starkey of the Astronomical Society of Las Cruces in an article on pages 32 and 33 of this issue.

We heartily invite all those who can to attend this astronomical conference. Everyone who is coming is requested to fill out the card and mail it promptly to:

Mrs. Clyde W. Tombaugh
Registration Chairman S.A.C.'68
P. O. Box 921
Las Cruces, New Mexico 88001

Your doing so will greatly assist the Convention Committee, will add to your comfort and enjoyment of the meeting, and will further allow a more smoothly functioning meeting.

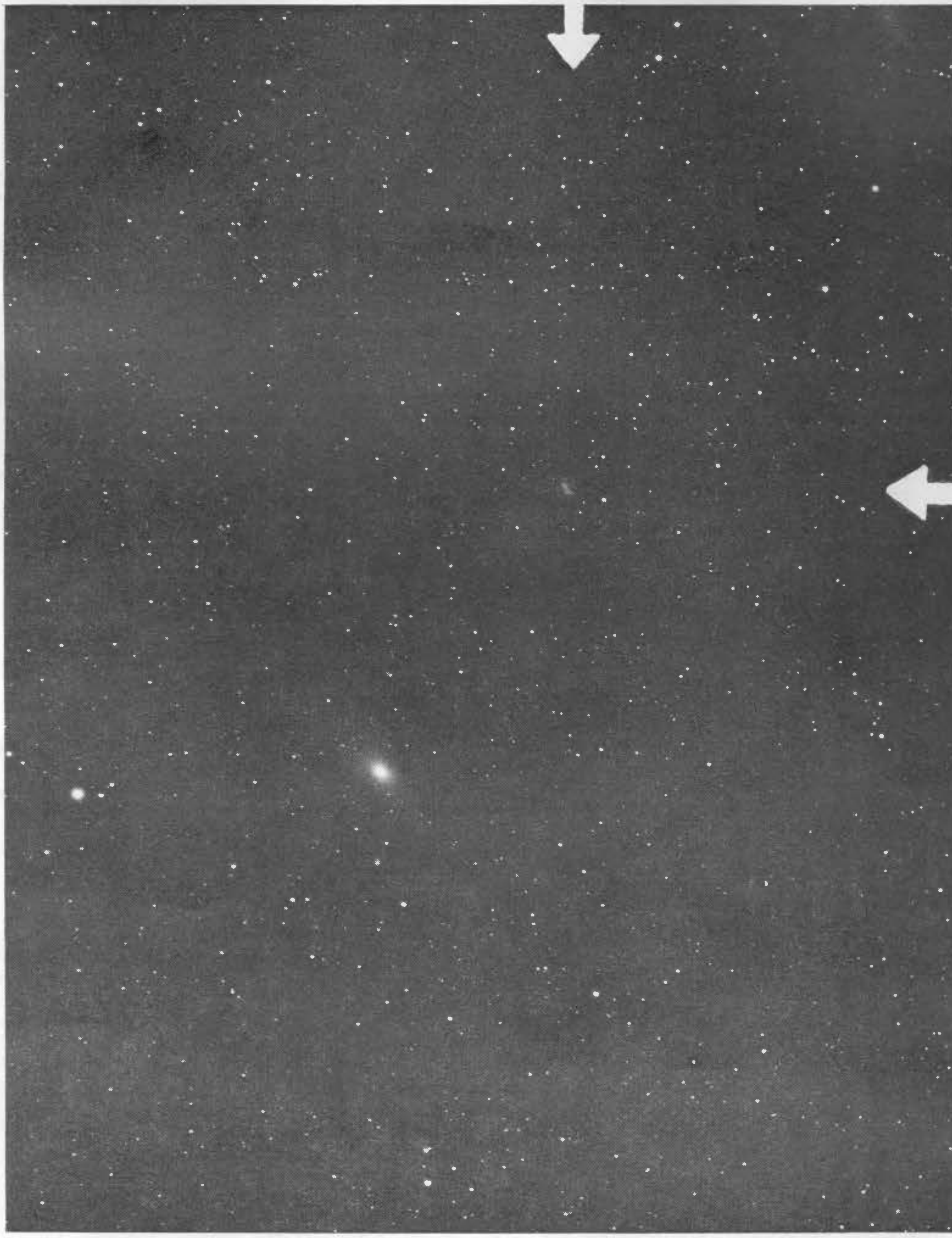

Figure 19. Photograph of Comet 1968a near the Andromeda Galaxy on May 2, 1968, 10^h40^m-11^h 0^m, U.T. Taken by Mr. R. B. Minton with a 4-inch f/6 Aero Ektar. North at top. The white arrows point to the comet, which is much fainter than the Andromeda Galaxy. The greatly elongated shape of the comet is caused by its rapid angular motion relative to the stars during the 20-minute exposure. See also text on pg. 29.

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We thank all A.L.P.O. members who have already contributed in any way to the S.A.C. '68. Mr. R. B. Minton still needs suitable display material from amateur attendees. Many A.L.P.O. members and others have submitted papers on a wide variety of subjects.

LUNAR, PLANETARY, AND COMETARY PROSPECTS, JUNE-AUGUST, 1968

Mercury will be at inferior conjunction on June 18, at greatest elongation west (21°) on July 11, at superior conjunction on August 7, and at greatest elongation east (26°) on September 20. The June-July morning apparition will not be a particularly favorable one for middle northern latitudes, and the ensuing August-October evening apparition will be still less so for such observers.

Venus is at superior conjunction on June 20. On August 1 98% of the disc is illuminated. The planet will be south of the sun in August and poorly placed for observers in middle northern latitudes.

Mars is in conjunction with the sun on June 21.

Jupiter is in conjunction on September 9. It will thus be well placed in the evening sky in June, less well placed in July.

Saturn will be well placed in the morning sky all summer as it approaches opposition on October 15. The rings are now opening, and during July and August the earth will have a Saturnicentric latitude of about 14° south.

Plato. The solar lighting shown in the Orbiter IV photograph on the front cover will occur again on August 5, 1968 at 1 hr., Universal Time. Earth-bound observers may enjoy comparing their telescopic view to this beautiful close-up.

Comet Ikeya-Seki, 1967n. Dennis Milon has communicated a continuation of Brian Marsden's ephemeris from our preceding issue.

1968 E.T.	R.A.(1950)	Dec. (1950)	Δ	R	Magn.
Aug. 12	$7^h38^m.62$	+41° 22'.4	3.475	2.709	11.0
22	7 41.08	40 42.4			
Sept. 1	7 42.15	40 11.6	3.424	2.892	11.3
11	7 41.54	39 49.7			
21	7 38.88	39 36.0	3.288	3.077	11.5
Oct. 1	7 33.74	39 29.4			
11	7 25.68	39 27.8	3.101	3.263	11.6

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STAFF

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