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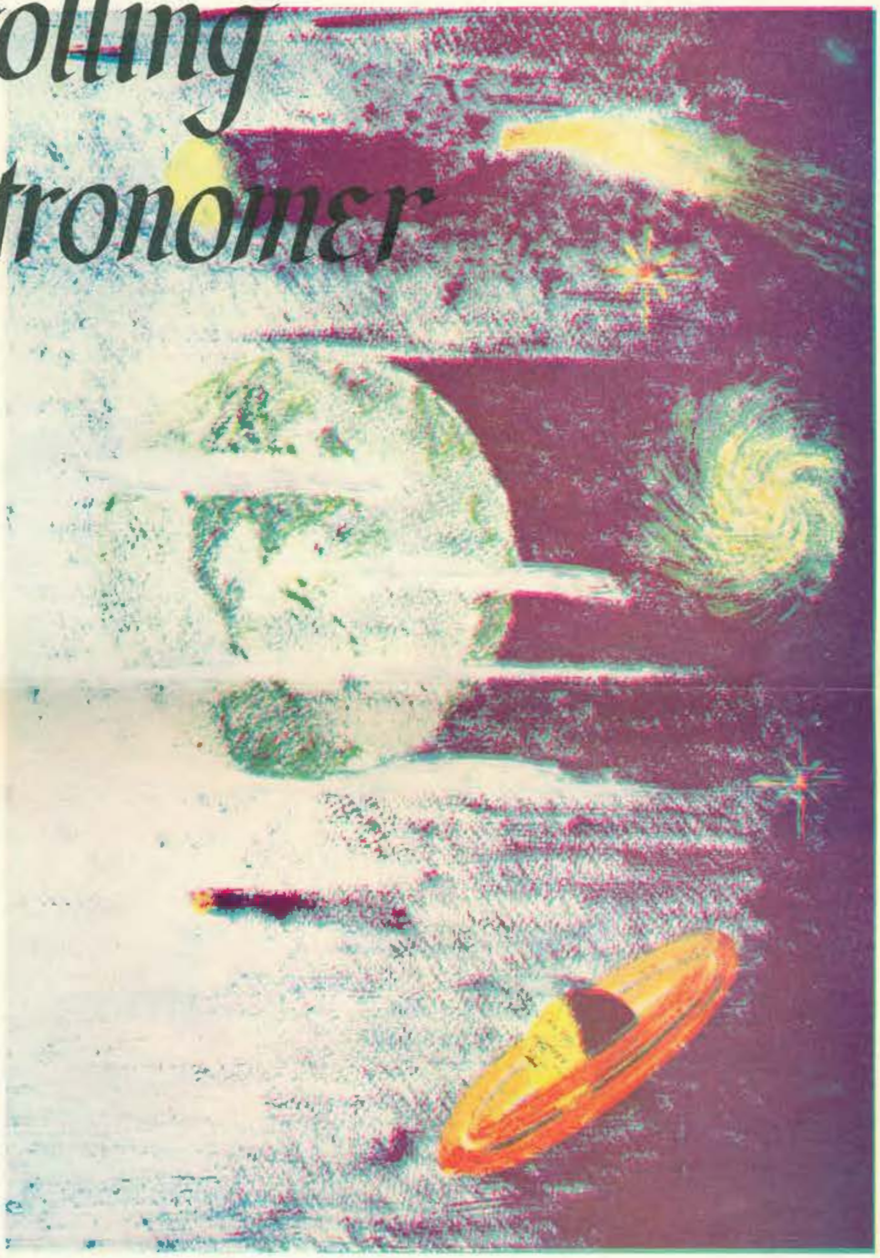
ASSOCIATION OF LUNAR AND PLANETARY OBSERVERS



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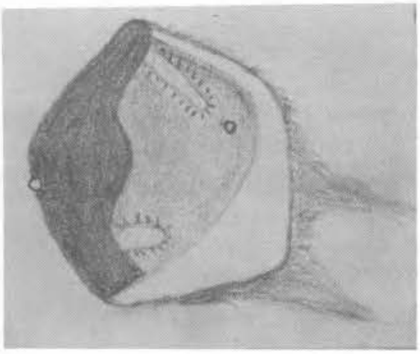


Fig. 1. Lunar Crater Proclus.
J. T. Carle.
Feb. 1, 1952. $3^h\ 5^m$, U.T.
8-inch refl. 360X
Colong. = 333°3

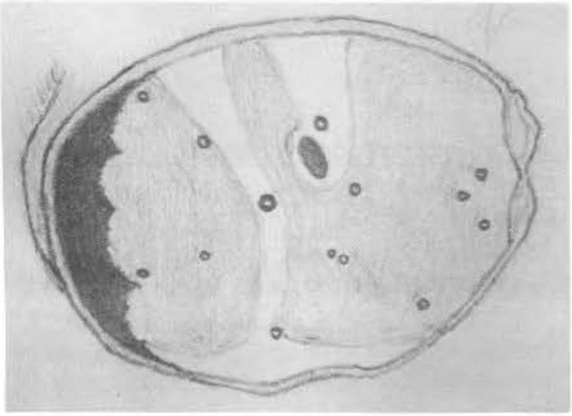


Fig. 2. Lunar Crater Plato.
J. T. Carle
Feb. 5, 1952. $5^h\ 10^m$, U.T.
8-inch refl. 180X.
Colong. = 21°9

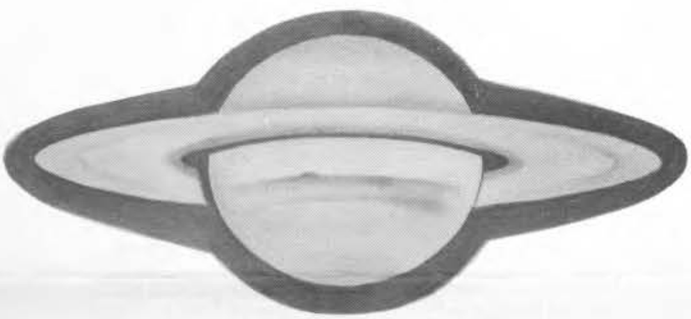


Fig. 3. Saturn.
T. Osawa.
Feb. 5, 1952. $20^h\ 36^m$, U.T.
6-inch refl. 230X.

Fig. 4. Mars.
C. W. Tombaugh.
18-inch refr. 550X.
April 2, 1952. $12^h\ 30^m$, U.T.
C.M. = 259°

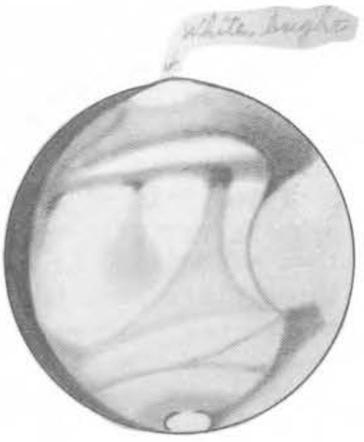


Fig. 5. Mars
T. Saheki. 8-inch refl. 330X, 400X.
Jan. 18, 1952. $19^h\ 45^m$, U.T.
C.M. = 345°.

Fig. 6. Mars.
T. Cragg. 12-inch Refl. 168X.
April 4, 1952. $7^h\ 5^m$, U.T.
C. M. = 161°.

Correction to April, 1952, Issue. On pg. 57, line 24 of this issue we implied that a north cap 280 kms in diameter would have subtended an angular diameter of 0".8 on February 5, 1952. Recomputation shows that the correct figure is 0".3.

A Possible A.L.P.O. Directory. A few readers have expressed interest in a complete listing or directory of all A.L.P.O. members. We have given this matter some thought, but a directory appears rather impractical at this time; its inclusion in our regular issues would crowd out other material, and its separate publication would be costly. However, we do plan, beginning with this issue to give the addresses of observers and contributors so that interested readers can compile for themselves their own directory of at least our most active members. We shall not give the addresses of staff-members listed already on the front inside cover, nor shall we repeat the addresses of others in more than a few successive issues.

A.L.P.O. Authors. Several of our members have recently published articles. Patrick A. Moore, Glencathara, Worsted Lane, East Grinstead, Sussex, England is the author of "What We Know about the Moon" on pp. 18-40 of The Journal of the British Interplanetary Society for January, 1952. In a very readable and well-illustrated article Mr. Moore describes recent B.A.A. and A.L.P.O studies of our satellite and dwells at some length upon the evidence that the moon is not quite so dead and changeless as the authors of textbooks would have us believe. He discusses, among other subjects, lunar meteor searches, systems of radial wall bands perhaps more prominent now than in the past, and possible topographical changes in several regions. C. B. Stephenson, Dearborn Observatory, Evanston, Illinois wrote upon "The Light-Curve and the Color of Vesta" in The Astro-physical Journal for November, 1951. He describes photoelectric observations of Vesta made at the Yerkes and McDonald Observatories. Mr. Stephenson determined that the light-curve of Vesta has a period of 0.2226 days and an amplitude of 0.12 stellar magnitudes. Past work on Vesta having given inconsistent results, further photoelectric studies are desirable. Joaquin A. Garcia, Box 1823 U.P.R. Rio Piedras, Puerto Rico in February, 1952, wrote, along with R. Arce and A. Cobas, about "A Hodoscope Unit with the Neon Lamps Normally Off". The hodoscope unit is employed in cosmic ray experiments, and the work discussed was done at the University of Puerto Rico Cosmic Ray Laboratory. Mr. Garcia has kindly furnished a reprint of his short article, which we shall be glad to lend to interested A.L.P.O. members.

Foreword by Editor. We express our thanks to H. Percy Wilkins, 35 Fairlawn Ave., Bexleyheath, Kent, England for the following article. However, we shall best express our thanks to Mr. Wilkins, the Lunar Director of the British Astronomical Association and the author of the map of the moon being serially reproduced in this periodical, by making some careful observations of Bailly. In particular, members with telescopes more than ten inches in aperture and of good optical quality have here an opportunity for lunar research.

The Xi-Eta coordinate system referred to by Mr Wilkins should be explained. The lunar surface is projected upon a plane tangent to it at the center of the disc at mean libration. The origin is at the point of tangency. The Xi-axis is determined by this plane and by the plane of the moon's equator; Xi is positive to lunar west. The Eta-axis is perpendicular to the Xi-axis and is positive to lunar north. The unit used in expressing both Xi and Eta is one-one thousandth of the moon's radius in the tangent plane.

THE LARGEST LUNAR CRATER

by H. Percy Wilkins, F.R.A.S.

With the publication in this issue of The Strolling Astronomer of Section XXII of my large lunar map we enter upon the region of the giant craters distinguished alike for their vast size and their profound depth. At the head of this great display stands Bailly, close to the southeast limb and which, but for its tint, would resemble a small "sea". Neison made its diameter 148.7 miles, Elger 150, Goodacre 160, while Dr. Dolmage in Astronomy of Today in 1909 gives 180. Recently D.W.G. Arthur has computed the diameter as 183.6 miles so that there can be no doubt that it is the largest crater which we can see.

The center of this enormous formation is at Xi-360, Eta-920. The enclosing mountain ring rises on the west to 13,000 feet, and on the east one peak attains 14,800 feet above the interior. Owing to its size Bailly attracted the attention of the early observers; on the fine old map of Hevelius in 1647 it is called Mons Meridionalis, and on the chart of Riccioli in 1651 is appears as Bettinus Oder.

The first detailed description and representation appears in what Berry in A Short History of Astronomy in 1898, article 271, calls this "storehouse of valuable detail", the Selenographische Fragmente of Schroeter, 1791, and 1802. His drawings in Vol. 2, Plates TL, Figure 1 and TLIX, Fig. 1 show the craters A,B,C, D,E,F, and several others on my map. These remained the best drawings until the publication in 1837 of the grand Der Mond of Beer and Maedler, in which appears a detailed drawing of Bailly based on observations with a 3.75-inch refractor during the evenings of November 14, and 15, 1835. Bailly was then presented under favorable conditions of libration; and the drawing shows the walls in careful detail, the principal craters, and also some of the ridges and hills on the interior. The depth of the crater A (Maedler's A) was measured as 2093 toises on November 14 and 2404 toises on November 15, giving a mean of 2248 toises. Since a toise equals 6.39 feet, the depth found by Maedler was 14,365 feet. This crater A, the largest and the most prominent on the interior, has been named Hare on the Third Edition of my 300-inch map. Owing ot its depth and considerable latitude a third of its interior must always be immersed in shadow.

The well known American observer, E. E. Hare [1621 Payne Avenue, Owensboro, Kentucky], using a 12-inch reflector, obtained a valuable photograph on October 4, 1950, at $11^h\ 25^m$, U.T. On the following morning a detailed drawing was made with a power of 300X under favorable libration at colongitude 198°.6. On October 25, 1951, at colongitude 200° the drawing was corrected; and new detail was added. This drawing shows approximately 140 objects on the interior, a number far in excess of any previous representation.

Noting that Hare's craters A,B,F,G, and D correspond to my map's B,A,C,E, and F respectively and that Hare's B,F, and I are Maedler's A,B, and C, an interesting comparison may be made between the three charts. The map crater A, now called Hare, is shown by Maedler as having a regular wall except where it adjoins the crater B, where the wall is depicted as broad and is shown to be cut through by two valleys not noted by any other observer. Immediately to the south of B Maedler shows a hill, and in several instances the smaller craters of other observers are shown as hills by Maedler.

My own observations have shown that the interior of Bailly, naturally convex, is not of uniform depth; the extreme southern portion, beyond Hare, is raised above the remainder and is traversed by a cleft, which runs from the crater B to a ridge near the great east wall. The northern portion of this wall is not so high as the remainder and is commonly concealed by shadow for some time at sunrise. There is a peak or craterlet, it is uncertain which, on the crest of the east wall of B, while a meridional ridge runs northward from Hare but does not reach the northern rampart. On this ridge are several hills or peaks; the one nearest to Hare is shown as a hill by Maedler and has presented this aspect to me, but Hare depicts it as a crater and calls it P. Under favorable conditions on December 25, 1944, I observed some parallel ridges running in a northwesterly direction from the nearly central ridge to the main west wall.

It is clear that the principal features have remained virtually unchanged during the past 155 years, from the time of Schroeter to the present. Admitting that his drawings are rough and that Maedler's special chart in Der Mond, as distinct from the Mappa Selenographica, is a valuable and careful piece of work, we are at a loss to account for the valleys traversing the wall of Hare so evident to Maedler in 1835 but not seen either before or afterwards. Assuming that he made no mistake, and it is difficult to understand how he could have drawn them so clearly if they were not visible to him, we cannot escape from the conclusion that they have since been filled up. Indeed the wall between the craters A and B is much more narrow now than drawn by Maedler, apparently owing to an enlargement of either A or B, judging from Maedler's drawing. It is thus possible that activity of some sort and of sufficient magnitude to modify the appearance of the crater walls in our telescopes has taken place since Maedler observed in 1835. The appearance of some object on the wall of B and the variable appearance of Hare's spot P, both in the same part of the interior as the possible wall change, suggest that activity may have been exhibited in this area. It is also remarkable that Maedler should draw a strongly marked mountain abutting on the south wall of the crater B (map nomenclature), where now an obvious crater occupies the site; and this circumstance tends to confirm the possibility of some change within this portion of Bailly since the time of Maedler.

In due course it is hoped to present a complete chart of Bailly compiled from the observations of both American and British observers, together with micrometrical measures of the wall peaks; and to this end observations are invited.

THIRD REPORT ON JUPITER, 1951-52

by Ernst E. Both

During January, February, and March, 1952, observations were received from the following: E. E. Both (6-inch refl., 8-inch refr.); P. Cluff, 4101 E. 4th St., Long Beach 14, Calif. (6-inch refl.); K. B. Cockhill, 2362 Hingston Ave., Montreal, Quebec, Canada (6-inch refr.); E. Epstein, 1914 N. Curson Ave., Hollywood 46, Calif. (6-inch refl.); T. E. Howe, 7226 Bennett Ave., Chicago 49, Ill. (4-inch refl.); P. J. Nemecek, 3240 N. Walnut Grove, San Gabriel, Calif. (12.5-inch refl.); O. C. Ranck, P. O. Box 161, Milton, Penna. (4-inch refr.); E. J. Reese, 241 S. Mount Vernon Ave., Uniontown, Penna. (6-inch refl.); G. D. Roth, Privatsternwarte, Lengmoosstrasse 6, Munich 9, Germany (4.4-inch refl.); T. Saheki, No. 29 Shi-Jutaku, Urioni-cho II-24, Sumiyoshi-ku, Osaka, Japan (8-inch refl.); W. Sandner, whose address is known to Roth (8-inch refr.); R. Venor, whose address is known to Cockhill (6-inch refr.); and C. E. Wierzbicki, 1600 E. Gold Ave., Albuquerque, N. M. (3-inch refr.).

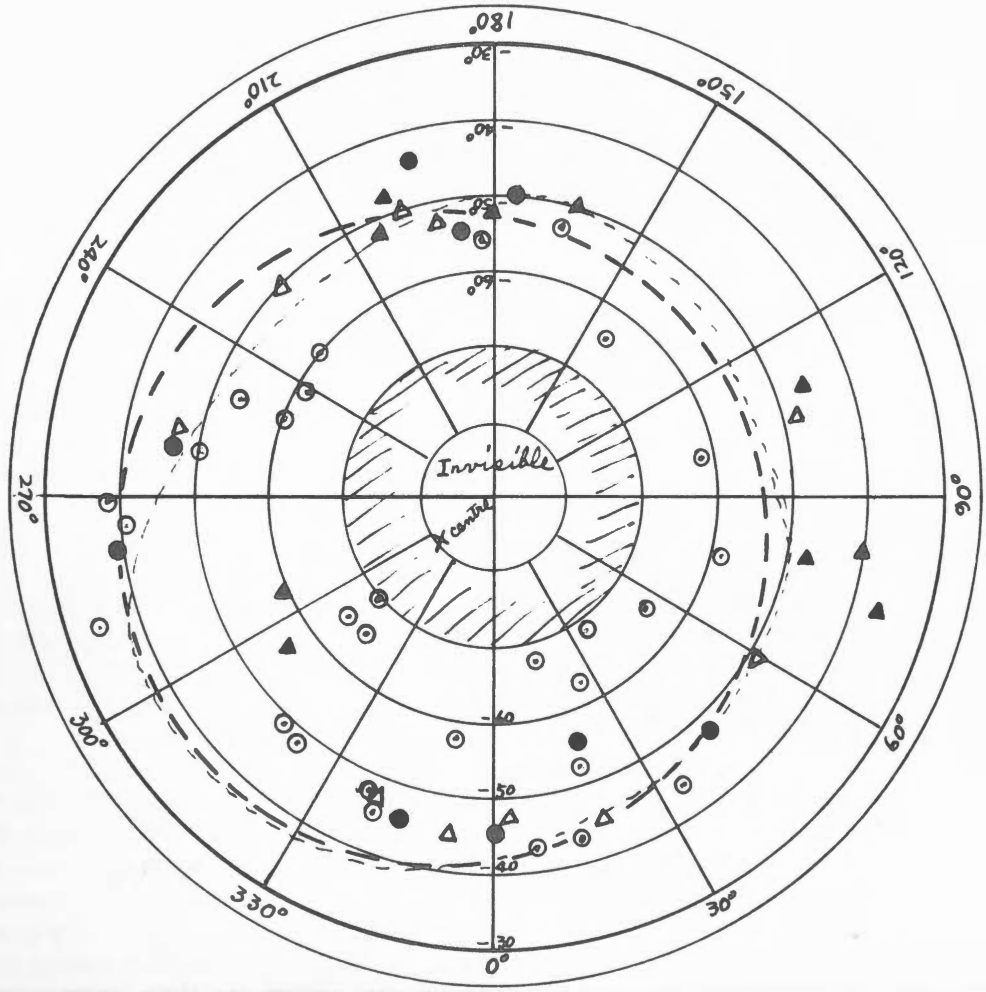


Figure 1. Japanese Observations of North Boundary of South Cap of Mars in Early 1952.

We wish to welcome to our list of observers Mr. Venor and Mr. Cockhill, both members of the R.A.S. of the Montreal Centre, Canada. We are also glad to have received observations from our colleagues in Germany-from Mr. Roth, who is known to our members, and from Dr. Werner Sandner, who is an old and very experienced planetary observer, also living at Munich. We also want to express our very special appreciation of the observations made by the following observers, who have sent in more than 50 drawings each: Phil Cluff, Owen Ranck, and Tsuneo Saheki.

Resumé of the South Temperate Belt Disturbances:

1. The Bartlett-Both Disturbance. It was first observed by Bartlett on August 19, 1951 (The Strolling Astronomer, Vol. 5, No. 11, pp. 10-11, 1951). We have these longitudes (II): August 19, west or preceding end of object, 177°, Bartlett: August 21, prec. end of object, 108°, Bartlett; August 22, west end, 110°, Both; August 24, west end, 108°, Both; August 24, east or following end, 233°, Bartlett; August 31, east end, 214°, Bartlett. The east end thus moved from 233° to 214° (II). The 69° of westward movement observed by Bartlett from August 19 to 21 appears to indicate a separate Disturbance; for as Walter Haas has correctly remarked, such a movement would be most remarkable and unusual.

1a. The Bartlett Disturbance. Observed by Bartlett on August 25, 1951, it extended from 293° through 360° to 10° (II).

2. The Epstein-Both Disturbance. This Disturbance was first recorded by Epstein on August 17, 1951; and it was seen as a split in the south border of the South Temperate Belt. We have these longitudes (II) of its center: August 17, 41°, Epstein; August 22, 41°, Epstein; August 31, 35°, Epstein; September 6, 30° Epstein; September 14, 26°, Both; September 26, 18°, Both; October 8, 7°, Epstein; October 12, 6°, Both; November 10, 344°, Epstein; November 25, 330°, Epstein; December 15, 315°, Epstein. The Disturbance moved at a gradual rate (of from 0°.7 to 1°.0 per day) from longitude 41° in August to longitude 315° (II) in December.

3. The Reese Disturbance. This Disturbance was a white cloud-like rift in the middle of the S.T.B. and was first recorded by Reese on August 18, 1951. There are these longitudes (II) of the center: August 18, 44°, Reese; August 18, 50°, Epstein (the same?); September 12, 28°, Reese; September 16, 21°, Reese; September 19, 20°, Reese; September 20, 20°, Epstein (the same? Epstein notes "white cloud in the south of the S.T.B."); September 21, 17°, Reese; October 3, 9°, Reese; October 10, 4°, Reese; October 15, 1°, Reese; November 27, 325°, Reese; November 30, 324°, Reese. The Disturbance had a motion in decreasing longitude of 0°.77 per day.

4. The Both Disturbance. This Disturbance was significant since it showed a motion the reverse of the usual movement of cloud-like Disturbances. It was first recorded by Both on September 15, 1951, in the south side of the S.T.B. in the form of a whitish rift. These longitudes of the center are by System II; September 15, 244°, Both; September 20, 248°; September 26, 250°; October 14, 250°; October 16, 250°; October 28, 278°; 1952, January 2, 18°; February 4, 20°; February 7, 22°; February 10, 23°. The Disturbance moved at the slow average rate of 0°.92 per day in increasing longitude, with significant stops at a fixed longitude between September 26 and October 16 and again between January 2 and February 10. Both was unable to find this object again after February 10. [The extrapolation of the drift from October 28 to January 2 must be regarded as very risky, and intermediate observations are much needed to establish the object's behavior during this interval. - Editor.]

Other observers have also reported different Disturbances in the S.T.B during August and December, 1951. The four discussed above are the most significant ones.

The Red Spot:

Since the apparition is at an end, we record here the results of various transit-determined longitudes (II) of the Red Spot. The work of different observers is here combined.

Date	Longitude of Center of Spot	No. of Observations
1951, July 15	259°.5	6
August 15	254.0	4
September 15	256.2	12
October 15	256.5	20
November 15	260.0	6
December 15	261.8	10
1952, January 15	259.0	8
February 15	258.0	2

There were thus 68 observations in all. Our work gives an oppositional longitude on October 3, 1951, of 257°5 and a daily motion in increasing longitude of 0°016 (compared to 0°014, according to E. Maedlow in Mitteilunger fuer Planetenbeobachter).

Zones. The zones were rather dull in their general appearance during the last months, as well as during the whole apparition. Even the interesting spot-formation in the Equatorial Zone, as observed especially by Saheki (see the Second Report in The Strolling Astronomer for February, 1952) disappeared during January and February; and in March the E.Z. was as uninteresting as it can be.

Belts. A different situation presented itself in the belts, which still showed at least some structural change. In a letter of February 14, 1952, Mr. Reese wrote: "I have been very much interested in the distribution of color in the South Temperate Belt and the South Equatorial Belt North during the present apparition. The following summary [not published here] is based on 59 sets of estimates of the color of these belts from July 26 to November 22. I am confident that the color of these belts varied in different longitudes, but confirmation is needed". Here then is a summary of colors in the S.T.B. and the $S.E.B._n$ according to Reese, Bartlett, Both, Epstein, Saheki, Roth, and others for the period from July 20, 1951, to February 20, 1952.

The color of the S.T.B. appears to have changed from a bluish gray during July and August to a dark brown-gray in September-December, becoming a lighter gray during January. Reese writes: "From August 31 to November 9, a persistent and very decided neutral-gray or even bluish-gray section was seen between longitudes (II) 145° and 190°." The color in the $S.E.B._n$ underwent a positive change. It was a definite gray during July and August; then it changed to a brownish gray during September to reach finally an orange-brown, becoming, however, brownish gray again after December 15(?). Mr. Reese again finds a neutral-gray or bluish-gray section between longitudes (I) 310° and 30°, an observation which appears to be confirmed by Saheki.

North North North Temperate Belt. An interesting observation for this belt was also recorded by Elmer Reese. He found it to be conspicuous during this apparition, and it appeared to him rather diffuse and usually double. Reese found many dark sections in this belt, from which he computed its rotation-period in 1951 to be 9 hrs., 55 mins., 18 secs.

Since the 1951-52 apparition is now ended, we would again urge our observers to send in any unreported observations of Jupiter as soon as possible.

FIRST REPORT ON SATURN, 1951-52

by Thomas Cragg

Only a small number of observations of Saturn have been received as of this time; but now that the planet is easily accessible in the evening sky, more attention will probably be paid to it. Observations have been received (many of them indirectly from W. H. Haas) from the following contributors: T. R. Cave, Jr., 265 Roswell Ave., Long Beach 3, Calif. (12.5-inch refl.); T. Cragg (6-inch refl., 12-inch refl.), W. H. Haas (6-inch refl), T. Osawa, 844 Shinmen, Toyonaka, Osaka, Japan (6-inch refl.); O. C. Ranck, P. O. Box 161, Milton, Penna. (4-inch refr.); E. J. Reese, 241 S. Mount Vernon Ave., Uniontown, Penna. (6-inch refl.); and H. P. Wilkins, 35 Fairlawn Ave., Bexleyheath, Kent, England (15-inch refl.).

The most important observations made during this period were those of a dark spot on the south edge of the south component of the North Equatorial Belt, the strongest belt in the north hemisphere of Saturn. Ten central meridian transits have been secured by three members (6 by Haas, 3 by Cragg, and 1 by Reese); there does appear to be evidence of a change in the rotation-period. Near the beginning of March, 1952, Haas and Cragg agreed reasonably well on a period near $10^h\ 14^m.5$. At the beginning of the last third of March they agreed to within 0.2 minutes ($10^h\ 14^m.8$ against $10^h\ 15^m.0$). By the end of March Haas found a period of $10^h\ 15^m.3$. [These values are tentative and preliminary. They rest only upon the interval between two successive transits, not upon all the available data.] This object has never been a very prominent affair and was fading at the end of March. It isn't an easy object in a 12-inch. E. J. Reese observed the feature on March 27 (U.T. here and throughout this article) as a dusky festoon joining the North Equatorial Belt South and the Equatorial Band. This observation is surprising since no one else has yet reported seeing the E.B. except that Haas has glimpsed it as a very faint and narrow belt in the south part of the Equatorial Zone. At the present time it is a little difficult to say who was the first to see the object. T. Osawa shows it on a splended drawing made on February 5 and published as Figure 3 on pg. 61. The spot here discussed on the south edge of the strong N.E.B is on Figure 3 somewhat left of the central meridian; we may estimate that the transit occurred at about $20^h\ 20^m$, U.T., on February 5. Also, word has been received that Lenham in England picked up a spot as early as January 13, 1952; but we are not completely certain that his spot is the one followed by A.L.P.O. members in March.

[The best evidence about the appearance of the feature indicates that it consisted of a darker hump or bulge on the south edge of the N.E.B.$_s$, from which a faint, dusky, rather narrow column extended southward into the E.Z. On March 27 Reese in a good view observed this column to connect to the Equatorial Band, and he saw it to be flanked on each side by a brilliant spot in the northern part of the E.Z. It constitutes excellent, and to the Editor's mind decisive, evidence of the reality of the feature under discussion that on March 27 it was independently observed by Reese and Haas. Haas recorded its transit at $5^h\ 19^m$; Reese, at $5^h\ 25^m$. The amount and sense of the difference agree very well with results obtained by Reese and Haas on Jovian features.

Reese has prepared a valuable graph of the longitude of this marking as a function of date, the longitude being in a system proposed by Dr. A. F. Alexander some years ago. The drift-line established by A.L.P.O. records from February 29 to March 30 can be extrapolated backwards into January and February and falls close to Osawa's observation on February 5. English observations on January 13 and February 16 are not at all near the extrapolated drift-line and may hence indicate additional spots, but an English transit on March 1 is very close indeed. - Editor.]

Both polar regions were relatively inactive in the early months of 1952. Cragg saw a very faint belt and adjacent zone in high southern latitudes on February 29 and March 18. O. C. Ranck has noted some variations in the South Polar Region from November, 1951, down to the present time.

The N.E.B. was always the strongest belt on the planet and has chiefly been observed as double. (This belt is the same as the North Temperate Belt of the 1950-51 apparition discussed in this periodical. It is not a new belt). Ranck and Wilkins on one occasion each noted it as single, Ranck having it very dark at the time.

The South Equatorial Belt has been observed several times by Ranck, in all views by Cragg, once by Reese, and once by Wilkins. Ranck on March 31 saw the S.E.B. doubled, but it was single to Cragg on April 4 with seeing 6-7 and a 12-inch reflector. T. Osawa shows the belt as a dusky shading adjacent to the south edge of the ring-ellipse. Reese is suspicious about an apparent great darkness to him of the Ring A projection but remarks that the S.E.B is certainly an influencing factor. Cragg observed a grayish border where Ring A crossed the ball and noted the S.E.B. separately. This region could certainly stand some scrutiny.

The E.Z. was always the brightest region on the planet. Occasional very faint large ovals have been noted, but they have been exceedingly difficult to reobserve. Cragg was able to observe one such oval on both February 29 and March 3, giving a period of $10^h\ 14^m$.

The shadow of the rings on the ball lay <u>north</u> of the projected rings prior to March 27 and usually formed a narrow black line on the north edge of the Crape Ring projection. (The detailed geometry of the rings and their shadows is shown by L. T. Johnson's graphs on pages 50 and 52 of the April issue.) It is thus surprising that a drawing by Wilkins on March 24 appears to show the shadow <u>south</u> of the projected rings in a fine view with a 15-inch reflector. O. C. Ranck has occasionally observed the shadow on the south side of the rings. These shadows are very tricky at this time when the S.E.B. is so close. The south edge of the rings appears dark against the ball and can easily be confused with a very thin shadow. One must also consider the possibility of a faint dusky ring <u>outside</u> Ring A, which would appear as a dark projection against the ball to the south of the projected rings. This concept is mentioned because more than one observer has claimed to have picked up this other ring once in a great while.

The shadow of the ball on the rings has now changed over from the western side of the planet to the eastern. Very few observations have been received for the critical period around opposition, and more are desired. Wilkins may show the shadow as an extremely thin black line on the west side of the ball on March 24 at 22^h. Cragg observed on April 4 at $5^h\ 10^m$ and saw a distinct but very thin shadow east of the ball. Opposition occurred on April 1 at 10^h.

The rings are now opened widely enough to permit occasional very fine views of detail in them. A number of divisions have been picked up by various members. Haas has definitely seen Cassini's and the Third Division near the inner edge of Ring B and has strongly suspected Encke's in Ring A; Cave has seen Cassini's, Encke's, and the Sixth Division in Ring C and has strongly suspected the Fifth between B and C; Cragg has picked up Cassini's, Encke's, and the Fifth and has strongly suspected the Sixth; and Wilkins on March 24 was able to see Cassini's Division all the way around the visible portion of the rings. Wilkins' feat is really remarkable, for the Saturnicentric latitude of the earth was only $8^\circ\!.3$ at the time. Thus at least one observer was positive of having seen each of the six divisions recognized by the A.L.P.O. with the exception of the Fourth Division, a very elusive division first recorded by W. H. Haas in 1942 with an 18-inch refractor. The Sixth Division, it should be mentioned, was picked up by members of the A.L.P.O. in 1949 after it had been apparently lost for about fifty years.

A note of thanks should go to W.H. Haas for his untiring efforts in communicating most of the data here reported on the spot in the N.E.B.

OBSERVATIONS AND COMMENTS

When the graphs by L. T. Johnson on pages 50 and 52 of our April issue were reproduced, it was not feasible to show the small squares on the original sheets supplied by Mr. Johnson. The editor did not know of this limitation while writing the accompanying text, and the reader may hence have found the three numerical examples given on pages 51 and 53 difficult to follow. We suggest that the close student of the geometry of the Saturnian rings and their shadows may still be able to obtain very accurate measures on the published graphs by making his own finely divided scale on the edge of a piece of paper and perhaps by using a geometer's compass as well.

Jackson T. Carle, 2734 N. Sixth St., Fresno, Calif. has contributed the drawing of the lunar crater Proclus reproduced as Figure 1 on pg. 61. In his accompanying notes he comments upon the ridge in the southeast part of the floor, the small craterlet near the northeast tip of this ridge, the less distinct ridge in the northwest part of the floor, and the two bulges in the exterior shadow of the east wall. These two bulges are presumably due to peaks on the east rim. Mr. Carle thinks that the central bulge in the internal shadow of the west wall (Figure 1 on pg. 61) is due to a ridge on the floor rather than to a higher portion of the west wall. The east inner wall was very brilliant. Carle's craterlet is in the wrong position to be the craterlet recorded in December, 1951, by D. P. Barcroft and T. R. Cave, Jr. (The Strolling Astronomer, Vol. 6, pp. 28-29, 1952). Since relatively little detail has yet been mapped in Proclus, its study is recommended to equipped A.L.P.O. members.

Mr. Carle also observed the walled plain Plato at colongitude 21°.9 on February 5, 1952 (Figure 2 on pg. 61) and at colongitude 50°.9 on March 8. Colongitude is the lunar eastern longitude of the sunrise terminator. Figure 2 may profitably be compared to Figure 1 on pg. 5 of our January, 1952, issue, a map of Plato in 1946-7 by E. J. Reese, 241 S. Mount Vernon Ave., Uniontown, Penna. Carle saw well the near-central craterlet (Reese's A), the southeastern (Reese's C), and the twin craterlets D. All the other craterlets he recorded were visible by glimpses only. Their number is certainly large for a view with an 8-inch telescope. Though some of the craterlets look nearly circular on Figure 2 on pg. 61, their form is presumably elliptical and like that of Plato itself. Still using the nomenclature of Reese's map, one can identify on at least one of Carle's two drawings the east central splotch B, G, I, E(?), and perhaps one or two others. On March 8 Carle drew Reese's S, which lies about three-fourths of the way from A to C. Spot S was "Discovered" by Reese as an apparently new feature on September 10, 1949 (The Strolling Astronomer, Volume 3, No. 11, pg. 8, 1949) and has also been seen by E. E. Hare. On March 8 Carle found the western of the twin craterlets D to be very clearly larger than the eastern one. Curiously contradictory results about the relative sizes of these craterlets have been obtained by A.L.P.O. members, and it may well be that the twins are subject to irregular changes of an unknown nature. Of course, it is the high-sun bright spots around the craters which change, not the craters themselves.

In his February 5 view (Figure 2) Mr. Carle was especially interested in the very dark oval area a little southeast of the center of the floor. It was very plain when he began to observe but soon disappeared. He interprets it as a shallow depression full of shadow under sufficiently low solar lighting. If so, it is difficult to understand why it has not been regularly observed in many views soon before colongitude 22° - indeed, it is large enough that we might expect it to show on lunar photographs with apertures of ten inches and more. We urge our members to look for this dark oval in the future. Favorable local civil time evening dates in the United States in the near future are June 1, June 30, July 30, August 28, and September 27.

Robert M. Adams, 324 South Valley, Neosho, Missouri, at $1^h\ 30^m$, U.T., on March 29 observed the earthlit portions of the moon briefly with a 3-inch telescope at 80X. He noticed a point of light of approximately stellar magnitude 9 at the position of Aristarchus. It is reasonable to interpret this point of light as the brilliant central peak of Aristarchus, for which E.J. Reese has obtained an averaged stellar magnitude near 8.4 (The Strolling Astronomer, Vol. 4, No. 10, pg. 7, 1950). Since this central peak is often visible in fairly good views of the earthshine with small telescopes, we may expect such instruments to reveal possible lunar meteors and meteoritic impact-flares at least as dim as stellar magnitude 8.4. Comparisons of lunar features visible by earthshine with stars of known brightness near the moon are indeed the best method of determining the limiting stellar magnitude of our lunar meteor searches.

On March 9, 1952, at colongitude 64°.6 W. H. Haas observed Aristarchus with a 6-inch reflector at 298X and fair conditions. He noted the two principal dark bands on the east inner wall and found them to be nearly uniform in darkness all the way up to the rim. This observation thus disagrees with one by H. G. Allen on October 14, 1951, at colongitude 73°.8, when the southern of the two bands was very dark near the rim (The Strolling Astronomer for December, 1951, drawing on pg. 1 and text on pp. 14-15). Indeed, it is hard to resist the conclusion that Mr. Allen then saw a very abnormal aspect, whatever its explanation. In his March 9 view Haas noted a dark spot on the floor at the foot of each of the two wall bands, without much doubt craterlets partly full of shadow.

On pp. 27-28 of our February issue we spoke of a peculiar appearance in the lunar crater Haze seen by Mr. F. H. Thornton in England. D. P. Barcroft accordingly examined Haze on February 29 (U.T., as usual) near colongitude 313° but saw nothing that appeared at all unusual. He found "no unusual colors, obscurations, or anything of the sort". Such was also the experience of W. H. Haas on March 30 at colongitude 318°.1; he used 188X and 298X on a 6-inch reflector in rather poor seeing but a very clear sky. On or very near this date Barcroft again saw an apparently completely normal appearance. We learn from Skyward, the monthly newsletter of the Montreal Centre of the Royal Astronomical Society of Canada, that several of their members observed and drew Haze on February 29 and on March 29. Mr. Thornton has still not revealed exactly what curious appearance he has witnessed, apparently in the thought that confirmation will be much more significant if the later observer does not know exactly what he should look for. Without such specific information the best way of studying Haze will be careful and detailed drawings made at the telescope, especially when this crater is near the sunrise terminator.

T. E. Howe, 7226 Bennett Ave., Chicago 49, Illinois has constructed a map of the lunar crater Aristarchus on the basis of his observations in the early months of 1952 with a 4-inch reflector at 168X and 224X. Mr. Howe is especially interested in a group of four near-central peaks in Aristarchus; and three of these can be confirmed on Figure 4 on pg. 1 of the March, 1951 Strolling Astronomer, a drawing by E. J. Reese on March 31, 1950 at colongitude 60°.2. These three are the largest peak near the center of Aristarchus, a smaller and lower peak to its north, and a smaller and probably very low peak to the west of the largest peak. Shadows on Mr. Reese's drawing verify that all of these are truly peaks. Mr. Howe's fourth peak is absent from this drawing, nor is it shown on some dozens of other A.L.P.O. drawings of Aristarchus in our files.

We have on hand several reports of the results of searches for possible lunar meteors and possible lunar meteoritic impact-flares. First, however, it may be well to sketch briefly the general background of this problem. It was realized several decades ago that the incessant meteoritic bombardment of the assumedly completely atmosphereless moon must produce some impact-flashes visible from the earth in the telescope and even to the eye, and several writers expressed surprise about the seeming lack of observations of these flashes. This lack can be explained if we impute to the moon even a very thin gaseous envelope; because of the much slower decrease in density with increasing altitude of a lunar atmosphere as compared to the terrestrial one, a lunar atmosphere with a surface density only one-ten thousandth the surface density of the earth's atmosphere would be an effective shield against meteoritic bombardment. Perhaps the best theoretical discussion of the problem is Dr. Lincoln La Paz's "The Atmosphere of the Moon and Lunar Meteoritic Erosion", Popular Astronomy, Vol. 46, pg. 277, 1948. W. H. Haas was apparently the first to speculate in print upon the telescopic observability of meteors luminous in a lunar atmosphere in a series of articles called "Does Anything Ever Happen on the Moon?" in J.R.A.S.C. in 1942; and he later summarized the results of searches up to 1946 for possible lunar meteors in "A Report on Searches for Possible Lunar Meteoric Phenomena", Popular Astronomy, Vol. 55, pg. 266, 1947. Briefly, then, if the moon is totally devoid of atmosphere, we may expect to observe stationary flashes of meteoritic impacts at cosmic velocities upon the surface of the moon. If it instead possesses a very rarefied atmosphere, we may expect to observe, first, luminous lunar meteors as moving bright specks having short paths and brief durations of visibility and second, a greatly reduced number of meteoritic impact-flashes. We thus have the opportunity to differentiate empirically between the two hypotheses and to decide on the basis of accumulating statistical data - naturally steadily gaining in significance as its quantity increases - whether the moon has a very thin atmosphere or not. Therefore, searches for possible lunar meteors and possible lunar meteoritic impact-flares are one of our A.L.P.O. observational projects. One desires a very dim background for detecting such objects so that our searches have been chiefly conducted upon the earthlit portions of the moon several days before or after new moon.

E. L. Forsyth, R. R. 1 - Box 4, Fallbrook, Calif. spent a total of 7 hours in lunar meteor searches on January 28 and 29 and February 5 and 6. He employed a 6-inch reflector at 75X. Results were negative. Of course, one should not neglect to report results merely because they are negative; for in a statistical problem like this one, negative results may be fully as important as positive ones. Noting that the moon was at its first quarter on February 2, we suggest that the chances of detecting lunar meteors had grown very slim indeed by February 5 and 6.

Joseph A. Anderer, 7929 S. Loomis Blvd., Chicago 20, Illinois watched the second quadrant (northeast) of the moon for lunar meteors on March 28 and 29. He employed a 3.5-inch reflector at 60X for a total of 25 minutes. The aperture is rather small for this project. His results also were negative.

On March 27 W. H. Haas employed a 6-inch reflector at 47X in lunar meteor searches for 9 minutes. He saw nothing. So brief a search is ordinarily worth very little, but on this occasion the earthshine was exhibited rather well because the age of the moon was only 30 hours.

Lyle T. Johnson, Box 187, La Plata, Maryland has communicated a valuable report of his 1951 searches for possible lunar meteors. Using a 10-inch reflector at 179X and 221X, he spent a total of 19 hours on 18 different dates in such searches. He has further reported two searches by others in 1951, one by O. C.

Ranck for 20 minutes on December 2 with a 4-inch refractor at 60X and one by E. E. Hare for 12 minutes on June 10 with a 12-inch reflector at 100X. Ranck and Hare obtained negative results. Mr. Johnson had adopted the practice, which others might well imitate, of watching two selected regions of the earthshine, each having an area of about a million square miles. In evening searches he wathces an area near the east limb centered upon Grimaldi; in morning searches he watches an area near the west limb centered near Messier. These areas have the advantage of being as far as possible from the sunlit crescent; in addition, the familiarity gained with the regions makes it easier to locate accurately any luminous objects which may be seen. It is Mr. Johnson's experience that conditions for lunar meteor searches are much more favorable in the morning than in the evening and that the maria near the west limb appear to be darker than those near the east limb.

Mr. Johnson saw or suspected these objects:

1. 1951, January 13. $0^h\ 43^m$, U.T. Suspected a faint flash just off the limb south of Grimaldi.

2. March 13. $1^h\ 35^m\ 50^s$. Suspected a tenth magnitude flash at the limb south of Grimaldi.

3. April 11. $2^h\ 39^m\ 30^s$. Suspected a seventh magnitude flash in Mare Humorum.

4. May 9. $1^h\ 42^m\ 10^s$. A barely visible speck moved a distance less than the width of Grimaldi in 1.0 to 1.5 seconds. It lay a few miles west of Grimaldi. The position-angle toward which it moved was 250°.

5. September 7. $1^h\ 16^m$. A swift telescopic meteor crossed the field of view. It would, of course, be visible only from near La Plata.

6. September 28. $10^h\ 0^m\ 55^s$. Suspected a very faint meteor in Mare Nectaris. Length of projected path 80 miles. Moved toward position angle 110°.

7. October 26. $8^h\ 48^m\ 15^s$. Suspected a sixth magnitude flash in Mare Crisium.

8. October 26. $9^h\ 39^m\ 55^s$. Saw a very faint, flickering, moving speck between Mare Crisium and Mare Tranquilitatis. Duration 3-4 seconds. Length of projected path 110 miles. Moved toward position angle 80°.

9. November 4. $23^h\ 55^m\ 5^s$(?). Very faint meteor on limb just north of Grimaldi. Duration 2 seconds. Position angle 270°.

10. November 25. $10^h\ 54^m\ 45^s$. Suspected flash in Mare Tranquilitatis.

11. 1951, December 3. $1^h\ 8^m$, U.T. Suspected a flash near Cruger. Not sure whether moving or stationary.

Johnson stresses that he was not at all certain of the reality of many of these 11 objects but that he reports them because of the possibility that some other observer may have had a better look at them. Therefore, we urge all readers who have searched for lunar meteors to examine their notebooks to see whether they were watching the proper portion of the moon at any of the times above when Mr. Johnson saw or suspected a moving speck or a flash. If they were, we eagerly await word from them.

J. G. Moyen, P. O. Box 8584, Hollywood 46, Calif. has reported what is certainly the most extensive group-study yet carried out upon lunar meteors. Moyen, Carroll, Larr, Cook, Wells, and Scheiber during 1951 spent 19 hours in lunar meteor searches on the same number of dates. They used 6-inch telescopes except that Mr. Larr sometimes employed a 20-inch reflector. Moyen observed near Paso Robles, Calif.; the others, in the Los Angeles area. It was attempted to have at least two observers working simultaneously so that lunar meteor or impact-flare would be confirmed. They did well with this plan: at least two observers were watching on 14 dates; at least three, on 9 dates; at least four, on 4 dates; and fully five, on 2 dates. We offer our congratulations! It is the opinion of these observers that conditions are favorable for lunar meteor searches only when the elongation of the moon from the sun is between 40° and 60°, hence on only two evenings a month. Chances for success are doubtless then optimun in middle latitudes. The results of these searches by Mr. Moyen and his colleagues were completely negative. We express our thanks to them and hope that others will imitate this group-study of possible lunar meteors. (There is, unfortunately, no overlapping between the searches carried out by L. T. Johnson and those made in California so that we have no new evidence on the reality of Johnson's 11 objects listed above.)

O. C. Ranck, P. O. Box 161, Milton, Penna. has continued to observe Uranus and obtained drawings on March 13, 15, and 18. Using a 4-inch refractor at 480X he still finds the edge of Uranus very dusky, perhaps an effect exaggerated by using 120X per inch of aperture. On each drawing he shows a bright area on the limb; a white area on the south limb at $0^h\ 30^m$ on March 13 may be identical with one on the west limb at $2^h\ 45^m$ on March 15. It looked less bright on March 15 but perhaps only because of poorer seeing and transparency.

Observations of Mars from early February to the beginning of April, 1952, have been received from W. H. Haas (6-inch reflector), T. E. Howe (4-inch reflector), T. Osawa, 844 Shinmen, Toyonaka, Osaka, Japan (6-inch reflector), and C. W. Tombaugh (24-inch Lowell Observatory refractor).

Mr. Clyde W. Tombaugh, 636 S. Alameda Blvd., Las Cruces, N. M. observed Mars with the Lowell refractor at an aperture of 18 inches on April 2. He followed the planet from $8^h\ 30^m$ to $13^h\ 0^m$, and a drawing he madd between $12^h\ 0^m$ and $13^h\ 0^m$ is reproduced as Figure 4 on pg. 61. It was made with fairly good seeing and excellent transparency. The Martian season was about a month after the summer solstice of the northern hemisphere.

When observation began at $8^h\ 30^m$ the Trivium Charontis was near the central meridian; just east (right in simply inverted view with south at the top) of the Trivium lay a small, dull light spot. Syrtis Major on the sunrise limb was covered by clouds. There were three bright areas on the sunset terminator at latitudes 10° N., 40° N., and 65° N., the one at 40° N. being large and as brilliant as the north cap. This cap was very small but fairly bright. The region south of Mare Cimmerium was a dull white. As the planet rotated, the white spot near Trivium grew larger and brighter; and finally the whole pentagon-shaped Elysium was brilliant white near the terminator.

Thoth-Nepenthes canal was as wide as Mr. Tombaugh has ever seen it in his long studies of Mars. The oasis tangent to its south edge near its junction with the Syrtis is not Lacus Moeris, according to Dr. E. C. Slipher, of which there was no trace. A small oasis on the north tip of Syrtis Major made it look unusually blunt. North and east of this oasis are the canals Nilotis, Nilosyrtis, Astaboras, and Vexillum (Figure 4). Hellas was brilliantly white on the southeast limb, with a still brighter small oval patch near its west edge. Hesperia was narrower than is normal.

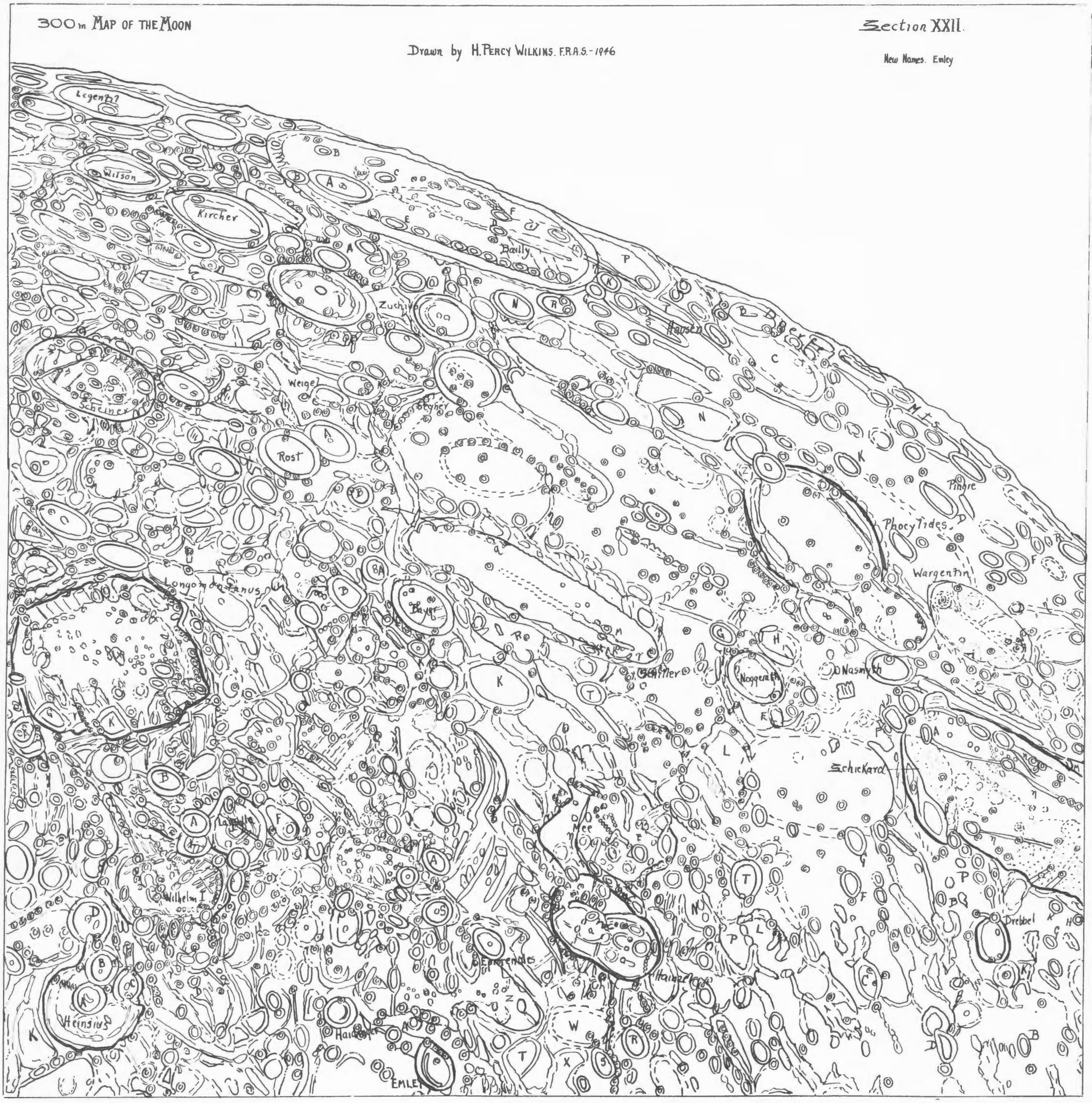
Mr. Tombaugh was very surprised at a dark development between Elysium and Thoth; it consisted of three oases or condensations joined by canals and lying roughly in a north-south line, as shown near the center of Figure 4. The northernmost oasis was the largest and had a fainter surrounding penumbral shading. This "new" dark feature appears to be joined to Lacus Sithonius northeast of Elysium. Dr. E. C. Slipher says that the region between Elysium and Thoth is especially subject to sudden, short-lived dark developments. It should receive the more attentive study on that account.

Figure 1 on pg. 65 may be examined in connection with T. Saheki's discussion on pg. 49 of our April issue of Japanese observations of the south cap of Mars in January-February, 1952. The figure shows the average north border of the cap as a strong, black, dashed circle; the lighter dashed lines should be ignored. The figure gives a polar projection of the southern hemisphere of Mars, and the manner in which latitude and longitude are indicated should be obvious. Individual determinations of the position of the edge of the cap are shown as follows: the black triangles are taken from measures along the C.M. on drawings by Osawa, the white triangles similarly refer to drawings by Tasaka, the black circles are the same date from drawings by Saheki, and the white circles are from drawings by Saheki for positions off the C.M. The large distances of many of these observed points from the dashed black circle must partly be due to changes in the size and position of the south cloud-cap. It will be noted that the center of the cap lay at latitude 81° S., longitude 305° and that its radius was 43 degrees. Figure 1 on pg. 65 was prepared and communicated by Mr. Saheki.

Howe's only observation was on March 16. Using a 4-inch reflector at 56X and 112X at C.M. 315°, he saw the markings imperfectly; but he did apparently see colors on the disc clearly. Syrtis Major was a dark blue; the north cap, light yellow (a cloud-cap?); the bounding north polar band, brown; and the deserts, orange. Some detail was glimpsed within the north cap.

On March 2 Haas watched the planet from C.M. 167° to C.M. 194°. The north cap was only moderately bright and had an estimated angular diameter of 23°. The south cap was slightly smaller and dimmer than the north cap. Elysium was fairly brilliant on the limb when observations began but was less so when they ended. Mare Cimmerium was less dark than Mare Sirenum. Propontis, the north polar band, Sirenum, and Cimmerium all had a purplish gray tone. Hades was seen well, but detail west of the longitude of Propontis was very difficult. In a poor view on March 9 at C.M. 57° Haas found the north cap small and apparently rather dull while the south limb was diffusely whitened.

Osawa obtained detailed drawings on February 5, 9, 10, and 26. The north cap was moderately brilliant, being possibly dimmed a little by overlying clouds; and it possessed a dark if very thin border. The south cap showed as a slight bulge on the limb on February 26 at C.M. 341°. Osawa saw these colors: very dark green in Mare Sirenum, bluish green in a suspected Solis Lacus, black in Margaritifer and Aryn, green in Syrtis Major, and a strong yellow over the deserts. The markings drawn largely accord with the description of the surface on pp. 42-3 of the March issue and pp. 57-8 of the April issue. On February 26 Osawa divided the forks of Aryn, saw Neudrus canal well, and found Margaritifer, Oxia Palus, and Indus canal to be extremely dark. Edom was whitish just west of Aryn. Near Propontis on February 10 Castorius Lacus, Euxinus Lacus, and Granicus canal were rather faintly visible. A thick and dark band connected Propontis II to the north polar "melt band". Hades canal was extremely dark to Osawa in early February. On February 9 Titan canal was intensely dark near Propontis I; but under similar conditions on February 10 Titan was not seen at all, though most of the other detail compares well on the two drawings.



SECTION XXII
of
H.P. WILKINS 300-INCH MAP OF THE MOON

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