The ASSOCIATION OF LUNAR AND PLANETARY OBSERVERS

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In This Issue

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The Strolling Astronomer

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NOTICE: In order to facilitate the reproduction of drawings in future issues readers are requested to exaggerate contrasts on drawings submitted. Extremely faint marks cannot be reproduced. Outlines of planetary discs should be made dark and distinct. It is not feasible to reproduce drawings made in colors. Following these precepts will permit better reproductions.

ANNOUNCEMENTS

Errors in Previous Issues. In the November-December, 1954 issue the second sentence in the first paragraph at the top of pg. 130 should be changed to read as follows: "With the exception of three cases - the SEB, EZ, and NPR - the estimates of these three observers at widely separated stations were within one whole number of each other."

Translation of Important Paper on the Origin of the Lunar Craters. In 1953 Mr. A. Paluzíe-Borrell of Barcelona published in the Spanish journal Urania a very important and detailed monograph with the title "Formación de los cráteres lunares." In a truly definitive treatment of the problem of the origin of the lunar surface formations Mr. Paluzíe discusses all the different theories. We have recently learned from our Spanish colleague that his treatise is being translated from Spanish into English through the kind offices of Mr. Patrick Moore, English lunar and planetary student and author. We are glad to pass this welcome news along to our readers; the translation will certainly be eagerly awaited by English-reading astronomers interested in the moon.

Yamamoto Observatory. Beginning with the year 1955 the name of the Tanakami Observatory at Ksatsu, Shiga-ken, Japan will be changed to the Yamamoto Observatory in honor of its founder. Mr. Tsuneo Saheki, the Mars Director of the Oriental Astronomical Association and a contributor to this periodical, has made many very detailed and lovely drawings of Mars with the 18-inch reflector of the Yamamoto Observatory. We understand that this telescope is the largest in Japan.

Mountain Area Amateur Astronomer's Conference. The Denver Astronomical Society is sponsoring a meeting of amameur astronomers in the Rocky Mountains on the campus of the University of Denver on September 9-11, 1955. Several lectures by professional astronomers are promised; but in addition amateur papers about telescope making, observing projects, astronomical photographs, astronautics, and the like are invited. Headquarters will be at the Chamberlin Observatory, whose 20-inch refractor will be available for observing. We suggest that interested persons write to this address: Conference Committee, Denver Astronomical Society, Chamberlin Observatory, University of Denver, Denver, Colorado.

Southern Stars. Such is the title of the official periodical of the Royal Astronomical Society of New Zealand, Carter Observatory, Kelburn, Wellington, New Zealand. Southern Stars is published four times a year as an attractive printed periodical of about 20 pages, similar in size to our Strolling Astronomer. Through the kindness of the Editor, Mr. K. D. Adams, we have received old issues of Southern Stars back to the year 1947. Founded in 1920, the Royal Astronomical Society of New Zealand is divided into sections somewhat like the British Astronomical Association. Subjects discussed in recent issues of Southern Stars include lunar and planetary observing notes, " A Scientific Consideration of Flying Saucer Reports" (of the validity of which the author is very doubtful), the Magellanic Clouds, comets, some experiments in lunar photography, and New Zealand observations of the transit of Mercury on November 14, 1953. We are sure that many A.L.P.O. members would enjoy reading Southern Stars.

Additions to Index of Volume 7 (1953) of The Strolling Astronomer. Mr. Howard G. Allen calls attention to some omissions from his index published on pp. 12-17 of our January-February, 1955 issue. These additions should be made:

Sunspots and Jovian Spots, Statistical Notes on - Nov. 155, 158, 159, 161

As before, the references to Volume 7 are by both month and page; and asterisks are used to indicate the presence of one or more drawings on that page.

SATURN IN 1954

by Thomas A. Cragg

Reference should be made first to the previous report "Interim Report -- Saturn Before Opposition"[1] where the general nomenclature and description of details are treated. This report contains chiefly additions to, and more complete information concerning, that report.

Additional observers contributing to the material used here are:

Robert Adams, Neosho, Mo.
Walter Barber, Atlanta, Ga.
Dr. James C. Bartlett, Jr., Baltimore, Md.
Richard M. Baum, Boughton, Chester, England.
Phillip Budine, Binghamton, New York.
Edwin Gilmore, Allentown, Pa.
A. P. Lenham, Swindon, Wilts., England.
New York Amateur Astronomers:
Helene Calamaras
Eugene A. Lizotte
E. P. Wallner, Jr.
(submitted through the courtesy of Edgar M. Paulton, Chairman Observing Group).
Clyde H. Ray III, Waynesville, N.C.
Tsuneo Saheki, Osaka, Japan.
Henry P. Squyres, El Monte, Calif.

Details of the Ball

Southern Portion of Ball: Avigliano confirmed Cragg's earlier observations of the STB on May 3 (Fig. 1) and June 3 (Fig. 3). This feature continued to be difficult because of the dark background. Almost all observers agreed that the southern portion of the ball continued its darkish appearance.

EZ: The EZ faded gradually after opposition, submitting to the outer portion of Ring B as the brightest part of the Saturnian system. Ranck and Lenham have seen festoon-like features crossing the EZ generally terminating in the EB and occasionally continuing to some area under the ring. Apparent further confirmation of these features was made by Avigliano and Westfall, though they saw them as very dusky widish streaks (Fig. 1). Cragg has seen dusky edges to the faint elliptical clouds occasionally seen in the EZ but he hesitates to call these festoons.

The large bright clouds which were largely absent during the first part of the apparition began making their appearance again in the EZ, but not as many as in 1953. These clouds were all very transitory and so were unsuitable for good rotation rates. Recently Bartlett and Cragg apparently agree that the darkening of the limb is so much greater in the EZ than elsewhere that it often presents the appearance of a bright cloud on the CM. One must be careful of this effect when recording bright clouds on the CM in the EZ.

EB: Avigliano, Cragg and Ranck observed this feature and their observations indicate a variability of intensity in the EB. Around May 3 for a short time (Fig. 1) and for a longer period near June 1 the EB was quite prominent. Some small concentrations or knots were observed where a festoon terminated on the EZ.

NEB: During the latter part of the apparition the two components of this belt were not always seen. The NEB_n on some occasions was a very thin belt and sometimes apparently disappeared. Humps, on the south edge of the NEB_s chiefly, and spots in the belt were observed by most of the contributors; but again they were too transitory for good rotation rates. Examples of this are illustrated by Westfall's untiring efforts

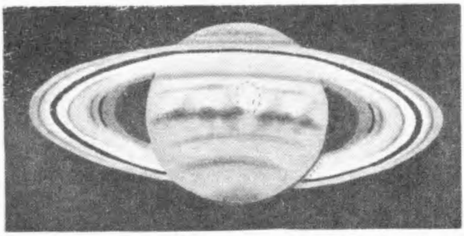


Figure 1. Saturn
D. P. Avigliano
May 3,1954. 7^h 30^m, U.T.
8-inch reflector. 325X, 480X.
Seeing fairly good.
Sky very clear.

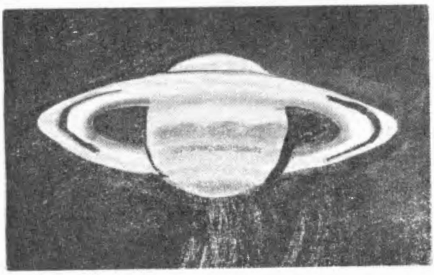


Figure 2 A. Saturn
J. E. Westfall
May 16, 1954. 4^h 20^m, U.T.
4-inch refractor. 180X, 360X.
Seeing poor.
Transparency poor.

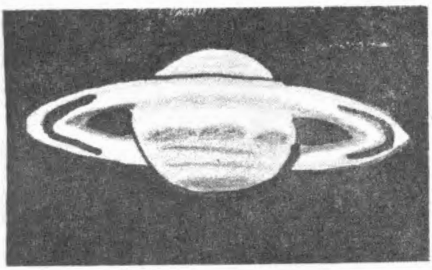


Figure 2 B. Saturn
J. E. Westfall
May 19, 1954. 4^h 0^m, U.T.
4-inch refractor. 180X, 360X.
Seeing poor.
Transparency poor.

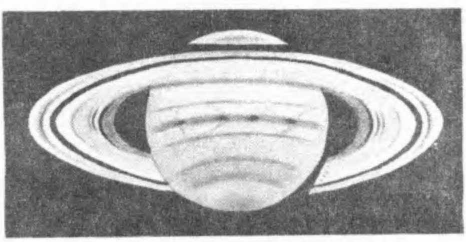


Figure 3. Saturn
D. P. Avigliano.
June 3, 1954. 6^h 45^m, U.T.
Lowell Observatory
24-inch refractor
at apertures of 12 to 17 inches.
310X, 540X.
Seeing fairly good. Sky very clear.

in securing drawings an integral number of rotations apart (showing the same side). May 16 and May 19 are examples (Figs.2A and 2B). It appears that micrometric measures are the only kind suitable for good rotation rates with such transitory spots. Good measures in several places as the feature moves across the disc are usable. Transits of a number of these dark spots were made chiefly by Bartlett and Lenham, but few if any spots were recognizable upon their return.

The fine structure of the NEB was studied by Avigliano on June 3 with the 24-inch refractor at the Lowell Observatory using 12" to 17" diaphragms (Fig. 3). One may wish to compare this with Cragg's view with the 60-inch on Mt. Wilson.[2] On several occasions in the past Cragg has remarked a dark central core down the middle of the belt resembling an absorption spectral line.

Generally the colòr of this belt has been a reddish brown, but a blue-gray has been observed also. Bartlett, Cragg, and Moore made color estimates of this feature in 1954.

NTB: The NTB was drawn by most observers. On several occasions it was found double by Ranck and possibly by Avigliano. One must be careful not to confuse the NNTB as part of the possible duplicity of the NTB. During the apparition a few faint spots were observed, but never recovered.[3] Again, with micrometric measures of these transitory spots we may get enough leverage on them to make a rough check on the spectroscopic period in these latitudes.

NNTB: This belt may have increased slightly in darkness during the latter part of the apparition, but it remained a difficult feature. More observers found the belt during the last part of the apparition than during the first part. (There were also more observers after opposition ! !)

NPR: All observers mention seeing this region quite dark during the whole apparition. Bartlett observed it as a blue-gray and Moore as a green most of the time. It will be interesting to see if the NPR gets as dark as the SPR was around 1942. At that time Saturn looked almost like a "flat-topped ball."

Shadows

The last part of the apparition found the shadow of the ring on the ball south of the projected ring ellipse and the shadow of the ball on the ring on the east side of the ball. All observers seeing the shadows placed them correctly.

Avigliano was one of the observers to tackle the problem of how close to opposition the shadow of the ball could be followed. The results are inconclusive though, since he followed the shadow up to April 26 but did not then recover it until May 8. Opposition was on April 26, making the interpretation of the observations rather difficult. It would be well for more observers to try this observation since it yields a clue as to the limit of visibility of linear detail, which is quite different from the Dawes Limit of resolution.

The shadow of the ring on the ball has been covered rather completely in recent articles [1, 4] so further elaboration here seems pointless.

Rings

Bicolored Aspect: This illusion has been mentioned from time to time by several people over recent years. The effect is that one side of the ring-arm seems redder than the other at times. W. H. Haas and F. Brinckman were among the first to note this difference,[5] but later Bartlett was the most frequent contributor to this problem. A moment's reflection immediately rules out all commonly known physical phenomena save refraction in the optics or an illusion of sorts. No real conclusion has been presented, but recent work by Bartlett gives rather convincing evidence that it is an illusionary phenomenon.

Relative Brightness across Rings: Almost all observers felt that the outer portion of Ring B was by far the brightest part of the rings, though several drawings by Ranck indicate the bright portion nearer the center of Ring B (if the Recorder interprets the drawings correctly). The innermost portion of Ring B was quite dusky most of the time.

Avigliano noted that the outer part of Ring A was darker than the inner part of Ring A several times, Encke's Division being the dividing line.

Ring C (the Crape Ring) was seen by most of the observers against the ball but in the ansae by fewer.

Ring D was positively confirmed this apparition by Avigliano, Cave, and Cragg (all observing it in the ansae) while most of the contributors saw evidence of Ring D crossing the ball.[4]

<u>Divisions</u>: Casinni's was observed clear around the observable portion of the ring by most observers; yet there were one or two who failed to see it ! This is one of the true space-gaps so is really quite black. Encke's Division was seen by many observers and most placed it in the center or slightly toward the outer part of Ring A. Cragg on occasion found this division the thinnest immaginable line. No. 3 was split in two on two occasions by Avigliano (Fig. 3), thus confirming Cave's and Cragg's view of several years ago.[6] This is an exceedingly difficult task, but should be looked for when excellent conditions prevail with large instruments. In an excellent view (No. 3 single) Avigliano showed the division slightly inside the outer border of the inner dusky shading on Ring B. Almost everyone has considered it as the outer border of this shading up to now.

No. 4 was observed by Avigliano, Cave, Cragg, Ranck, and Saheki. Earlier observations claimed this division to be a true space-gap, but large apertures with fine conditions are required for dependable results. No. 5 is fairly easy when Ring C is prominent. However, Avigliano, Cave, and Cragg were the only ones seeing it this apparition. No. 6 in the Crape Ring was observed by Cave and Cragg only, but definitely by those two. It is another division visible only when Ring C is seen easily.

All six divisions recognized by the A.L.P.O. were observed this apparition by at least two observers. Three new divisions were observed by members of our group also. As mentioned earlier[1], Cave found a division in Ring C between Nos. 5 and 6 but remains unconfirmed at present. Cave also found a division outside Encke's on Ring A, also unconfirmed, but it shows on Lowell's drawings in 1915.[7] Encke's Division has been recorded as double before. Indeed, Lowell has three divisions listed in Ring A. The third new division is very near the center of Ring B and was observed by Cragg, Lenham, and Ranck (when using a 30-inch refractor !). Toward the end of the apparition Cragg felt that this division was easier than Nos. 4 and 6. Since three observers saw this feature, one tends to feel that it should be listed as a confirmed division. As yet, its number hasn't been assigned (No. 7 seems a likely choice).

As new divisions are found, the existing numbering system becomes more cumbersome. The disadvantages of renaming or renumbering the divisions are numerous. Suggested solutions to this problem will certainly be welcomed and considered.

Satellite observations were continued by P. A. Moore but little more could be gained. Caution should be exerted in using Titan as magnitude 8.0 in satellite estimates, for 9.4 seems more to the point.[8] Again, magnitude estimates are <u>much</u> better when made with a variable star sequence (or with a photometer). In 1956 Saturn will pass near several variable star fields on the A.A.V.S.O. lists, which offer an excellent opportunity to do valuable work on the satellites.

The Recorder wishes to thank those who made a special effort on Saturn in 1954. It was gratifying to see the response.

<u>References</u>

1. "Strolling Astronomer" , Vol. 8, Nos. 3 & 4, p. 29.
2. "Strolling Astronomer" , Vol. 8, Nos. 3 & 4, p. 30, Fig. 2
3. "Strolling Astronomer" , Vol. 8, Nos. 3 & 4, p. 30, Fig. 3
4. "Strolling Astronomer" , Vol. 8, Nos. 9 & 10, p. 102.
5. "Strolling Astronomer" , Vol. 4, No. 1, p. 11.
6. "Strolling Astronomer" , Vol. 2, No. 5, p. 4.
7. "Memoirs of the Lowell Observatory", I, No. II, Plate II, 1915.
8. "Strolling Astronomer" , Vol. 7, No. 8, p. 117.

JUPITER IN 1954-55: FIRST INTERIM REPORT

by Robert G. Brookes

Foreword. The Interim Reports on Jupiter are being changed, to a certain extent, from the way they were written last apparition (1953-54). About half the space alloted is being used for drawings, which will allow two to three times as many drawings to be used with each Report. We feel that this change is desirable since the majority of the reports received from observers consist of full disk drawings. A series of properly chosen drawings will convey more information to the observer than word descriptions. We hope that you like and approve our ideas and we would appreciate receiving critical comments about the Reports.

Observers. This Report covers the period of time from August 15, 1954 to February 1, 1955. During this period reports were received from the following observers:

Observer	Telescope	Station
Leonard B. Abbey, Jr.	6 & 30*in. refls.	Decatur, Ga.
Robert M. Adams	4.3-in. refr. 10-in. refl.	Neosho, Mo.
W. F. Barber, Jr.	6-in. refl.	Atlanta, Ga.
P. W. Budine	3.5-in. refl.	Binghamton, N.Y.
Thomas A. Cragg	100**in. refl.	Mt. Wilson, Calif.
Jack Eastman	6-in. refl.	Manhattan Beach, Cal.
Walter H. Haas	12.5-in. refl.	Las Cruces, N.M.
Alan P. Lenham	9-in refl.	Swindon, Wilts, England
Philip R. Lichtman	8-in. refl.	Washington, D.C.
Toshihiko Osawa	6-in. refl.	Osaka, Japan
Owen C. Ranck	4-in. refr. 3.5-in. refl.	Milton. Pa.
Clyde H. Ray III	3.5-in. refl.	Waynesville, N.C.
Elmer J. Reese	6-in. refl.	Uniontown, Pa.
Milton Rosenkotter	10-in. refl.	Pierce, Nebr.
Frank Suler	5-in. refl.	Richmond, Texas
Steadman Thompson	6-in. refl.	Columbus, Ohio
John E. Westfall	4-in. refr.	Oakland, Calif.

* 30-inch Cassegrain reflector at Bradley Observatory, Decatur, Ga.

** 100-inch reflector at Mt. Wilson Observatory, Calif.

Description

The first reports received of this apparition indicated that the SEB had faded considerably from its conspicuousness during the previous apparition (1953-54). Generally speaking, the Giant Planet remained rather quiet as regards activity observed in the belts; however, there was some activity in the autumn when the aspect of the Red Spot area changed from that of the Hollow to that of the Spot. From around mid-January onward the EZ showed signs of being disturbed, very much so on some occasions. The colors seen on Jupiter remained rather faded and inconspicuous as has been the case in recent years. The northern hemisphere usually displayed the most color, the NEB dominating with deep red and brown tones.

Belts. The NEB remained the most prominent belt with the STB and SEB following, first one and then the other being the more conspicuous. In order of their decreasing conspicuousness the belts usually recorded were: NEB, SEB and STB (about same), NTB, SSTB, and NNTB.

A fragmentary EB was observed on several occasions by Abbey, Ranck and Westfall (Figures 6 and 12). On January 29, 1955, 0:45 U.T., CM_1 155°, using the 30-inch reflector at Bradley Observatory, Mr. Abbey definitely saw a thin band west of the CM in the EZ at the right latitude for the EB.

Figure 4. Jupiter.
L. B. Abbey, Jr.
6-inch refl.
Aug. 30, 1954. $8^h\ 30^m$, U.T.
$C.M._1 = 192^\circ$. $C.M._2 = 162^\circ$.
Seeing fairly good.
Sky very clear.

Figure 5. Jupiter.
J. E. Westfall.
4-inch refr. 180X, 360X.
Sept. 19, 1954. $10^h\ 30^m$, U.T.
$C.M._1 = 181^\circ$. $C.M._2 = 358^\circ$.
Seeing poor. Sky clear.

Figure 6. Jupiter.
J. E. Westfall.
4-inch refr. 180X to 720X.
Oct. 23, 1954. $12^h\ 0^m$, U.T.
$C.M._1 = 203^\circ$. $C.M._2 = 120^\circ$.
Seeing and transparency rather poor.

Figure 7. Jupiter.
F. Suler.
5-inch refl. 201X.
Oct. 31, 1954. $10^h\ 0^m$, U. T.
$C.M._1 = 313^\circ$. $C.M._2 = 170^\circ$.
Seeing rather poor. Sky very clear.

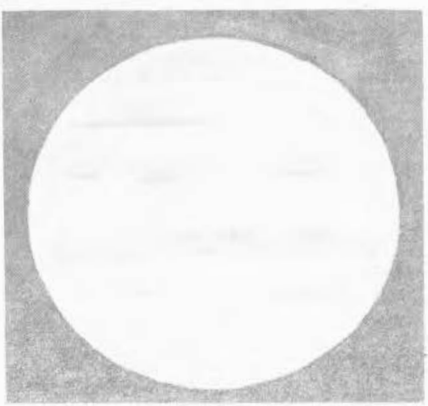


Figure 8. Jupiter.
T. Osawa.
6-inch refl. 230X.
Dec. 2, 1954. $18^h\ 10^m$, U.T.
$C.M._1 = 267^\circ$. $C.M._2 = 237^\circ$.
Seeing fair. Sky very clear.

Zones. The NTrZ was usually recorded as being the brightest zone. The EZ was considerably duller than during 1953-54 but on occasion it became very bright. There was considerable festoon activity in the EZ. The long-enduring brighter sections of the STeZ are being observed regularly. The aspect of the STrZ and STeZ are very well shown on Reese's drawing of January 8, 1955 (Figure 13). Mr. Reese, who has kept a very close watch on the STeZ's long-enduring bright areas, wrote as follows: "The three long-enduring bright areas in Jupiter's South Temperate Zone remain very prominent objects. The longitudes (II) of these areas at opposition on January 15, 1955 were:

A	73°	D	246°
B	155°	E	270°
C	177°	F	52°

[The above letters correspond to the letters on Figure 13.]
Their average rotation period between December 13, 1953 and January 15, 1955 was $9^h\ 55^m\ 11^s.4$ which corresponds to a westward drift of 21.4 degrees every 30 days relative to System II. The bright areas continue to decrease in length; however, since 1950 they have been fairly stable in this respect." During 1940 the average length of the bright areas was 93°, decreasing to 29° by 1950 and to 22° by 1955.

The Red Spot Area. The aspect of this area changed from that of the Hollow to that of the Spot in the Fall of 1954. Elmer Reese followed this change in some detail and observed the Spot to develop in a most unusual manner. There follows a complete résumé of Mr. Reese's observations:

On September 2, 1954 Mr. Reese observed a large bright oval in the STrZ extending from longitude (II) 263° to 285° which appeared to be the RSH (Figure 14 a). On October 25, 1954 he again observed the bright oval extending from longitude (II) 261° to 286°. On this date he also observed an elliptically shaped dusky mass extending from longitude (II) 278° to 301° following the bright oval (Figure 14 b). The dusky mass resembled the RS but since it followed the Hollow by some 17° it seemed unlikely that it was the Spot. However, on November 8, 1954 Mr. Reese observed the RS area completely devoid of the Hollow while the RS was clearly seen as a dark tan ellipse from longitude (II) 276° to 301° (Figure 14 c)! Mr. Reese comments: "This is very puzzling. Either the bright oval centered near 274° (II) on September 2 and October 25 was not the Hollow or else the Spot and Hollow are not necessarily concentric. (Observers have frequently reported the Spot to be slightly displaced relative to the Hollow, but never by as much as 17° !)"

The longitude (II) of the "bright oval" observed by Mr. Reese on September 2 and October 25, 1954 was very near the longitude one would expect for the RSH from its drift during the previous apparition. Thus it would not be an unsafe conjecture to say that the "bright oval" was the Hollow, and undoubtedly the "dusky elliptical mass" following the "bright oval" was the RS; subsequent transits of the RS will support this conclusion. If substantial evidence supporting Mr. Reese's observation is forthcoming, then there will have been established, beyond doubt, one of the most unusual phenomena of the RS area that has been observed since the discovery of the Spot itself.

Observations and Comments. We have received two photographs of Jupiter taken by Philip R. Lichtman during the period covered by this Report. Mr. Lichtman, using a telescope of only 8 inches aperture, has secured some photographs of excellent quality for such a small aperture. One taken on January 5, 1955, 3:24 U.T., CM_1 59°, CM_2 137° is very good. It shows the following belts in the order of their decreasing conspicuousness: NEB, STB, SEBs and SEBn (combined), SSTB, a broad double NTB, and NNTB (?). The photograph also shows a bright area east of the CM in the STeZ that is possibly the bright area B - C of Figure 13. This photograph was taken in white light. The other photograph, while not showing as many belts, is also very good. It was taken on January 8, 1955, 5:45 U.T., CM_1 259°, CM_2 311°. The belts shown in the order of their decreasing conspicuousness are the NEB, SEBs, and SEBn, STB, NTB (broad but not

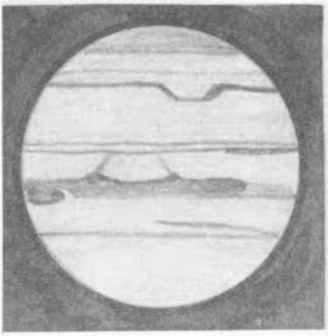


Figure 9. Jupiter.
L. B. Abbey, Jr.
6-inch refl. 225X.
Dec. 21, 1954. $3^h\ 30^m$, U.T.
$C.M._1 = 212^\circ$. $C.M._2 = 42^\circ$.
Seeing fairly good.
Sky very clear.

Figure 10. Jupiter.
T. Osawa.
6-inch refl.
Jan. 18, 1955. $13^h\ 25^m$, U.T.
$C.M._1 = 320^\circ$. $C.M._2 = 293^\circ$.
Seeing rather poor.
Sky clear.

Figure 11. Jupiter.
O. C. Ranck.
3.5-inch refl. 95X.
Jan. 24, 1955. $22^h\ 50^m$, U.T.
$C.M._1 = 173^\circ$. $C.M._2 = 97^\circ$.
Seeing rather poor.
Sky clear.

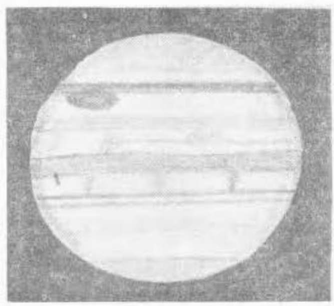


Figure 12. Jupiter.
O. C. Ranck.
4-inch refr. 120X.
Jan. 31, 1955. $0^h\ 5^m$, U.T.
$C.M._1 = 87^\circ$. $C.M._2 = 325^\circ$.
Seeing good.
Sky clear.

Figure 13. Sectional Drawing of SEB, STrZ, STB, STeZ, and SSTB of Jupiter by Elmer J. Reese on January 8, 1955. 6-inch reflector, 320X.

double as on January 5), and SSTB (?). Aside from the NEB the most prominent object on this photograph is the RS. There is a dark condensation following the RS and the RS Bay is apparent in the SEB. The photograph shows a tilting of the major axis of the RS to the plane of Jupiter's equator by about 10° in a south-preceding - north following direction. This photograph was taken in blue light (Kodak Wratten 47 filter).

John E. Westfall observed a rather rare satellite phenomenon on January 14, 1955, 5:15 U.T., 39 hours before Jupiter reached opposition. Mr. Westfall observed the shadow of JI to be partly obscured by JI itself. Such a phenomenon can occur only if the transit occurs within approximately 56 hours of opposition for JI decreasing to about 17 hours for JIV. For JII, JIII and JIV it is further necessary that the zenocentric declinations of the Sun and of the Earth be very nearly the same at the time of opposition.

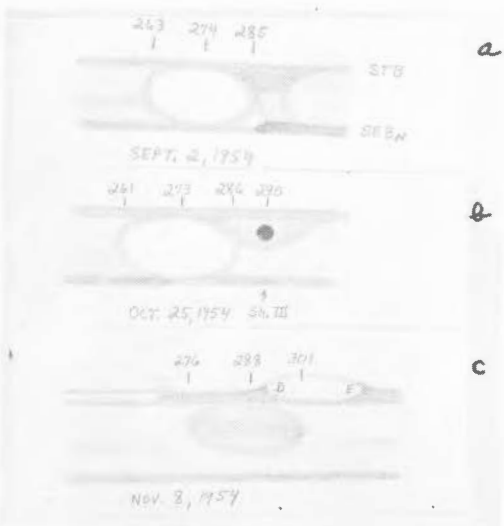


Figure 14. Three Sketches of Red Spot - Red Spot Hollow Region on Jupiter by Elmer J. Reese with a 6-inch Reflector.

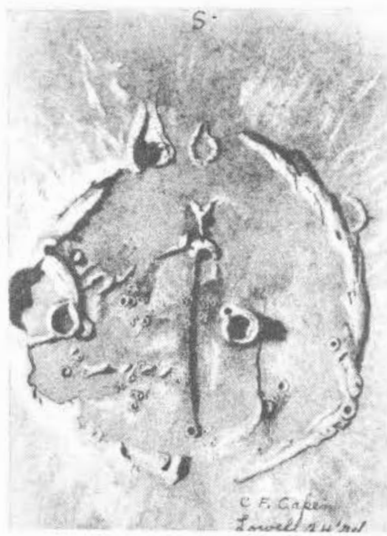


Figure 15. Lunar Straight Wall and Vicinity. Charles F. Capen, Jr. Lowell Observatory 24-inch refr. at 15 to 20 inches of aperture. 240X, 580X. April 1,1955. $3^h 0^m - 6^h 53^m$, U.T. Colongitude = 11°.5 - 13°.5. Seeing bad to fairly good. Sky very clear.

THE STRAIGHT WALL FAULT-SCARP

by Charles F. Capen,Jr.

The Lowell Observatory 24-inch refractor was employed for the lunar surface drawing of the Straight Wall fault-scarp as seen at lunar sunrise (Figure 15). Wratten Filters Nos. 8, 12, 15, 21, and 57 were used as aids in eliminating irradiation and heightening surface contrasts.

The Straight Wall has a light edge bordered by a narrow black shadow opposite to the Sun, which is to the left or west. It lies between the crater Birt on the right and the crater Thebit on the left. The Straight Wall fault is some sixty miles in length and about five hundred feet high. It was once mistaken for an artificial work; whence came its name "Railway". The crest of the cleft is not uniform in height, which is indicated by the varying width of the shadow at sunrise. Subsequent observations show it to be a fault-scarp in the surface plain of an old submergence crater. This old pre-maria crater can only be seen easily when the sun is low; the above drawing was made with the terminator on the very right (east) edge of the drawing. This same region was observed on April 2, 1955 from $2^h 15^m$ to $5^h 28^m$, U.T. at colongitude 23°.3 - 25°.0 using a 2/3-inch Cave erfle ocular giving a 58° field for appearance of the surface features under different lighting conditions and in order to check the previous night's drawing for surface object positions. As can be seen in the drawing, many small craterlets, rills, and clefts were recorded within this region.

According to J. E. Spurr's Geology Applied to Selenology, the Straight Wall fault-scarp was formed after the cooling of Mare Nubium, with its upthrow on the west. Traces of its extension, or a closely parallel one, can be noted on the Hell-plain floor approximately one hundred miles to the south and in line with the fault-line. To the west of the Straight Wall, the smooth surface does not appear to be that of Mare Nubium lava, but completely melted down "lunarite". To the east of the fault-scarp is the mare lava; however, the fault-scarp is not the exact dividing line between the remelted area and the original mare lava. This distinction between the two components of the surrounding plain region can be noted under higher lighting conditions than those for Figure 15. The Lick Observatory photograph, phase 10.35 days, shows the dividing line.

MARS 1954 - REPORT ON COLORS

by D. P. Avigliano

The many color reports on Mars that were received from our observers along with some excellent colored drawings has, happily, made possible this brief report on Martian colors in 1954.

The normal well known color of the Maria of Mars might be described as grey-green, blue-green or greenish, some observers seeing more blue in a given Mare, some more green and some more greyish shades, varying with the different observers. The desert regions of Mars usually appear to most observers as various shades of yellow-orange. Most of the following results were obtained from the work of more than one observer in each case and allowance was made as much as possible for the observer's individual color sensitivity. The period covered by the following color reports is from March to October, 1954.

Colors in the Maria.

Margaritifer Sinus - normal blue-green tone to most observers.
Mare Eyrthraeum - normal blue-green to most observers.
Aurorae Sinus - normal blue-green to most observers. Possibly more greenish than other similar areas.
Bosphoros Gemmatus - normal blue-green to most observers.
Mare Sirenum - very probably more bluish before July, 1954 and a more normal Maria tone afterwards.
Trivium Charontis and Cerberus I - very dark and grey, nearly black at times.
Mare Tyrrhenum - normal blue-green before July, 1954 and more grey-green afterwards. Traces of brownish or purplish in July and August.
Syrtis Major - The dark N. part of this area was quite bluish most of the apparition. In late June and early July a confirmed change of color in this area to black was noted, the area then becoming normal by later July. The S. portion of the Syrtis Major remained a more normal blue-green tone.
Sabaeus Sinus - normally a darkish greenish-grey but on June 19 and 20, 1954 a confirmed change to a brownish or lavender tone was noted. Its tone was more normal by July. The Meridiani Sinus was slightly darker than the arm of the Sabaeus Sinus.
The N. Maria regions - The predominant color of the Umbra, Utopia and Mare Acidalium regions was a more neutral grey. Blue tints were observed on occasions in Utopia and the Mare Acidalium.

Regarding the most interesting color changes in the Sabaeus Sinus and the Syrtis Major Mr. Clyde W. Tombaugh writes: "In 1950, the Sabaeus Sinus was lavender or magenta, very similar to this year at opposition. Syrtis Major seems to have a habit of turning black at some oppositions. It did so in 1939." Tombaugh also comments on the difference in the vivid colors of the S. Maria compared to the more drab colors in the N. Maria: " I interpret the difference to the climate of the two hemispheres. The summer of the S. hemisphere occurs very near Martian perihelion; whereas the summer of the N. hemisphere occurs near aphelion, and it is too cold for the low form of vegetation to grow well."

Canal and oasis color. Most of the time the canals and oases were seen as a neutral grey tone. At times certain of the more prominent canals and oases showed a greenish color similar to the S. Maria, among them the Solis L., Lunae L., Tithonius L.and the Propontis areas. Several of the canals and oases were blackish, among them the Agathodaemon, Casius, Juventae F., Ceti L., Melas L. and Hebes L.

The Nodus Laocoontis - Thoana Palus development - This region was usually seen as grey in tint, as also was the Thoth-Nepenthes. In early July, 1954 a dusky greenish was seen in this development.

The S. polar melt band - The dark band that surrounds the S. polar cap as it diminishes during the Martian S. hemisphere spring and summer was reported by most of our observers as bluish in tint. These bluish tones in this feature were reported from late June to early October, 1954. The dark extension starting from the melt band and running along the Yaonis Fretum (called the "Hellespontis flow") when well seen partook of the dark blue of the band.

In general the S. Maria showed more vivid coloring at the earlier part of the apparition and they became duller in the following months during which time they broke up into finer detail.

The following observers contributed most of the material on the foregoing Maria colors: J. C. Bartlett, Jr., C. F. Capen, Jr., T. R. Cave, Jr., S. Ebisawa, W. H. Haas, T. Saheki, C. W. Tombaugh and D. P. Avigliano. Special mention of the color work done by Clyde W. Tombaugh and Charles F. Capen, Jr.should also be made here, Tombaugh submitting some truly excellent colored drawings of Mars. We are indeed indebted to these observers for their work on Martian colors.

Colors in the deserts. The desert regions of Mars were noted in the finest views to show many varying tints from white-yellow to full orange. Some of the desert regions are known for showing white at times, due possibly to frost. It is these "frost" regions that we will now discuss.

Hellas - Normally the color of this famous region, when well seen, is a somewhat brighter and lighter orange-yellow than the surrounding desert regions. At times the region is seen as white or whitish, the whitening being noted most often in the Martian morning or evening when Hellas is on the limb or terminator of the Martian disc. Due to the many fine reports received on this area it has been possible to show in the following table the whitening of this region in 1954 in relation to the Martian seasons.

Terrestrial dates (1954	Martian S. hemisphere season	Percentage of observations received showing the color of Hellas at Martian morning or evening as:		Percentage of observations received showing the color of Hellas at Martian midday as:	
		Normal	Whitish or White	Normal	Whitish or White
Feb. 5 to June 16	mid winter through late winter	During these dates Hellas appeared to the majority of our observers as either part of the extended S. polar cap or undefined in shape.			
June 17 to July 24	early spring	During these dates Hellas appeared to the majority of our observers as dull or dusky and of an undefined shape.			

Terrestial dates (1954)	Martian S. hemisphere season	Percentage of observations received showing the color of Hellas at Martian morning or evening as:		Percentage of observations received showing the color of Hellas at Martian mid-day as:	
		Normal	Whitish or White	Normal	Whitish or White
July 25 to Oct. 6	mid spring	20%	80%	45%	55%
Oct. 7 to Nov. 10	late spring		100%	20%	80%

The increased whitening of Hellas (lasting at times through Martian noon) as the Martian S. spring advances will at once be apparent. See Mr. Tombaugh's comment under the discussion of Nix Tanaica. We wish to thank the following observers from whose work this table on Hellas was prepared: Abbey, Bartlett, Budine, Capen, Cyrus, Hake, Herring, McClelland, Osawa, Saheki, Suler, Tombaugh and Avigliano.

Tempe and Nix Tanaica - Here we will list the occasions in 1954 that either of these areas was seen as brighter or white.

April 2, Nix Tanaica weak and white.
April 7, Nix Tanaica white at Martian morning; this white dissipated later in the Martian forenoon (Tombaugh).
April 7, Nix Tanaica very bright white on limb (Capen).
April 14, Nix Tanaica brilliant white near limb (Saheki).
July 21, bright white limb area in following portion of Tempe (Saheki).
October 24, Tempe (partly on limb) was bright white (Bartlett).
In April and May Tombaugh reports considerable haze activity over Tempe.
In April, May and June Tombaugh also reports that frosts over Nix Tanaica were frequent in early morning or late afternoon Martian hours.

Here we will insert another comment by Clyde Tombaugh. In speaking of Nix Tanaica he states: "This area always whitens in exactly the same place. Its general appearance and manner of dissipation suggest that this area, 250 to 300 miles in diameter, is a plateau on which hoar frost is precipitated during the Martian night. This white area dissipates gradually between two and three hours after Martian sunrise. The Nix Tanaica, like the Elysium, exhibits this phenomenon several nights in succession, and at other times not at all. The conditions for this phenomenon to occur must require a certain degree of cold and an appreciable amount of precipitable water vapor in the region." It might be well to bear Mr. Tombaugh's last sentence in mind when considering the Hellas whitening also.

Elysium and Albor.

April 18, slight white on Elysium near terminator (Tombaugh).
May 31, Albor bright (Cragg).
June 2, frost area covering Elysium near limb (Capen).
June 30, Albor bright white near limb (Haas).
July 3, Elysium whitish near terminator (Haas).
July 15, Albor appeared yellowish-white near C.M. (Saheki).
Aug. 7, Albor whitish near C.M. (Avigliano).
Aug. 9, Elysium white near terminator (Haas).
Aug. 11, Albor whitish near terminator (Haas).
In April, May and June Tombaugh reports that frosts were frequent over Elysium in Martian early morning and late afternoon hours.

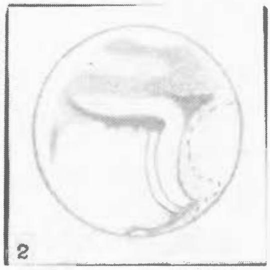
Other desert regions. Certain of the other desert regions appeared consistently much lighter yellow than their bordering desert zones; among these we should note the areas of Nymphaeum, the region N. of the Sabaeus Sinus extending to the Typhon, Edom, Deucalionis Regio, the S. part of Aram, Candor and Tharsis. Persistent cloud action over the latter two

MARS - 1954

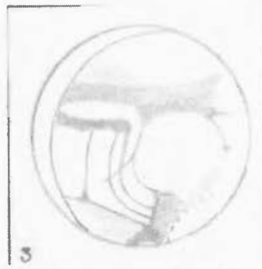
OBSERVER: C.F. CAPEN, JR.

* WRATTEN FILTERS NOS. 8,12,15,21,23A,25,57,64,38A & 47 USED

APRIL 2, 06:10 MST
24" RFT. AT 18" E.A.
310X AND 393X
CM 64°   ⊙139°.5
D⊕ 0°   D 9".8



APRIL 7, 03:45 MST
24" RFT. AT 16" E.A.
240X
CM 341°   ⊙142°
D⊕ -1°.0   D 10".4



APRIL 8, 06:00 MST
24" RFT. AT 21" E.A.
310X AND 240X WITH
FTRS.*   CM 5°
⊙142°.5   D⊕-1°.0 D10".4

MAY 20, 04:00 MST
9" AND 12" RFLS, 240X
AND 300X, AMBER FTRS.
CM 302°   ⊙164°.5
D⊕ -3°.6   D 16".5

MAY 26, 03:15-04:10
MST. 24" RFT. AT 22"
E.A. 520X FTRS.*
CM 241°   ⊙167°.5
D⊕ -3°.5   D 17".5

JUNE 2, 01:00-05:00
MST. 24" RFT. AT 15"
E.A. 310X & 540X
FTRS.* CM 156°
⊙171°.5 D⊕-2°.5 D18".8

JUNE 10, 00:00-01:00
MST. 24",12" & 7"RFTS.
292X,310X & 540X,FTRS.*
CM 72°   ⊙176°
D⊕ -1°.5   D 20".0

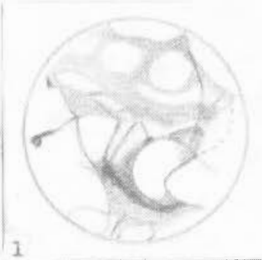
JUNE 12, 00:15-00:50
MST. 24" & 12" RFTS.
292X TO 540X, FTRS.*
CM 44°   ⊙177°
D⊕ -1°.5   D 20".3

JUNE 24, 00:00-01:25
MST. 24" RFT. AT 18"
E.A. 210X & 310X.
CM 305°   ⊙184°
D⊕ +1°.0   D 21".6

ON JUNE 10 THE 24" RFT. USED AT 10" TO 15" E.A.

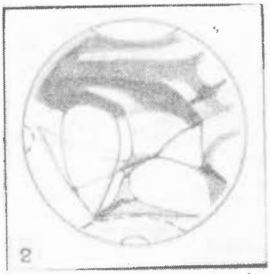
MARS - 1954

OBSERVER: C.F. CAPEN, JR.



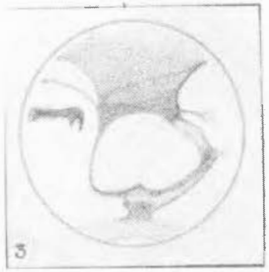
1

JUNE 25, 00:45-03:15
MST. 24" RFT. AT 12"
E.A.298X & 5" RFL, 230X
FTRS.* CM 291°
⊙184°.5 D⊕+1°.0 D 21".6



2

JULY 5, 00:00-01:10
MST. 24" RFT. 400X &
12" RFT. 294X, FTRS.*
CM 200° ⊙190°.5
D⊕ +2°.5 D 21".8

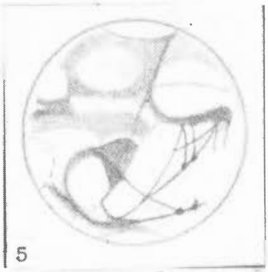


3

JULY 22-23, 22:30-
01:10 MST. 7" RFL, 106X
212X, 318X. FTRS.*
CM 31°.3 ⊙201°
D⊕ +4°.5 D 20".3

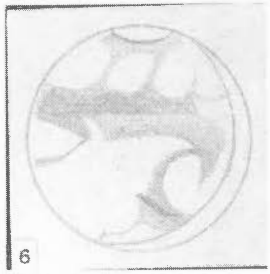
4

JULY 26, 00:10-00:45
MST. 7" RFT. 298X
FTRS.*
CM 12° ⊙203°.5
D⊕ +4°.5 D 20".1



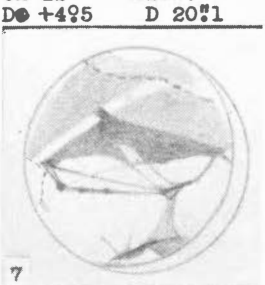
5

JULY 27, 20:30-21:10
MST. 7" RFT. 298X
FTRS.*
CM 306° ⊙204°
D⊕ +4°.5 D 19".9



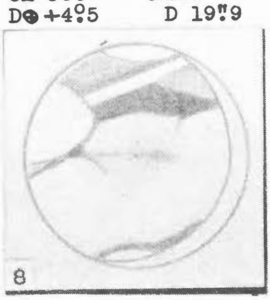
6

AUG. 6, 22:40-23:50
MST. 7" RFL. 298X
FTRS.*
CM 252° ⊙210°
D⊕ +4°.0 D 18".4



7

AUG. 9, 20:40-22:30
MST. 24" RFT. 310X-
420X FTRS.*
CM 188° ⊙212°
D⊕ +4°.0 D 18".1



8

AUG. 15, 21:00-22:15
MST. 9" & 12" RFLS,
250X & 450X, AMBER FTR.
CM 150° ⊙215°.5
D⊕ +3°.5 D 17".6

9

SEPT. 10, 20:30-21:30
12" RFL, 432X, 6" RFT,
288X
CM 184° ⊙232°
D⊕ -1°.5 D 13".9

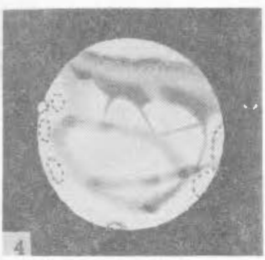
MARS - 1954

OBSERVER: D.P. AVIGLIANO

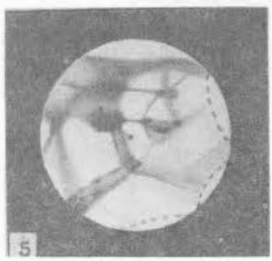
1
MAY 11, 09:05 U.T.
8" RFL, 325X
NEUTRAL DENSITY FTR.
CM359° ⊙159°.5
D⊕ -3°.8 D 14".9

2
MAY20, 09:05 U.T.
290X & 325X, 8" RFL
NEUTRAL DENSITY FTR.
CM 275° ⊙164°.4
D⊕ -3°.7 D 16".5

3
MAY 25, 07:45 U.T.
6" RFT, 215X & 321X
NEUTRAL DENSITY FTR.
CM 209° ⊙168°
D⊕ -3°.4 D 17".4



4
JUNE 3, 10:10 U.T.
24" RFT. AT 12" E.A.210X;
WITH YELLOW FTR., 310X
CM 164° ⊙172°.5 & 540X
D⊕ -2°.5 D 18".9



5
JUNE 11, 08:15 U.T.
8" RFL, 325X & 480X
NEUTRAL DENSITY FTR.
CM 65° ⊙176°.5
D⊕ -1°.5 D 20".2

6
JUNE 12, 07:30 U.T.
8" RFL, 325X
NEUTRAL DENSITY FTR.
CM 44° ⊙177°.1
D⊕ -1°.3 D 20".3

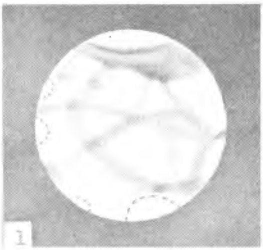
7
JULY27, 06:05 U.T.
12" RFT, 220X
WRATTEN #25 RED FTR.
CM 342°.5 ⊙203°.5
D⊕ +4°.5 D 19".97

8
JUNE 28, 09:00 U.T.
8" RFL, 325X
WRATTEN #25 RED FTR.
CM 284° ⊙186°.3
D⊕ +1°.5 D 21".8

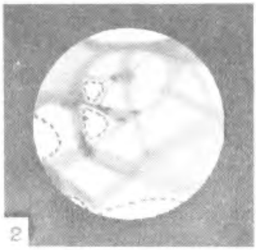
9
JULY 1, 07:15 U.T.
8" RFL, 325X
WRATTEN #25 RED FTR.
CM 233° ⊙188°
D⊕ +2°.0 D 21".87

MARS - 1954

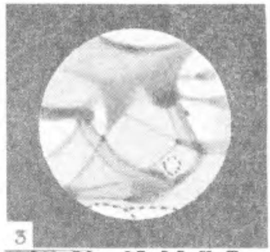
OBSERVER: D.P. AVIGLIANO



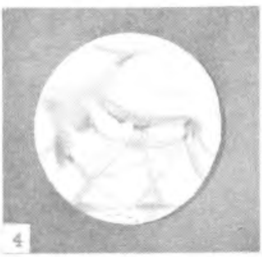
JULY 9, 05:55 U.T.
8" RFL, 325X
WRATTEN #25 RED FTR.
CM 142° ⊙ 192°.7
D⊕ +3°.2 D 21".7



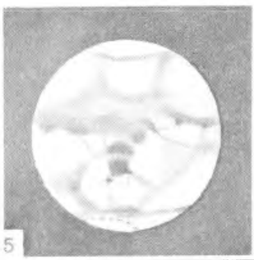
JULY 15, 06:00 U.T.
8" RFL, 325X & 480X
WRATTEN #25 RED FTR.
CM 89° ⊙ 196°.3
D⊕ +3°.9 D 21".3



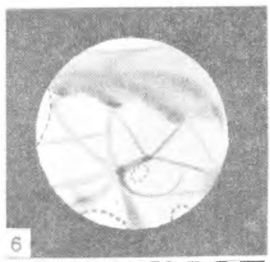
JULY 20, 05:10 U.T.
8"RFL, 325X
WRATTEN # 25 RED FTR.
CM 32° ⊙ 199°.3
D⊕ +4°.3 D 20".8



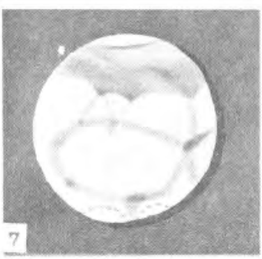
JULY28, 05:50 U.T.
12" RFT, 300X
WRATTEN # 25 RED FTR.
CM 330° ⊙ 204°.1
D⊕ +4°.5 D 19".8



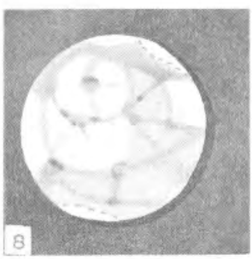
JULY 30, 04:50 U.T.
8" RFL, 325X
WRATTEN #23A ORANGE-RED
CM 297° ⊙ 205°.3
D⊕ +4°.5 D 19".6



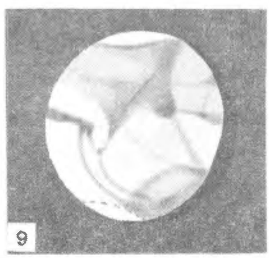
AUG. 7, 04:30 U.T.
8" RFL, 325X
WRATTEN #25 RED FTR.
CM 219° ⊙ 210°.2
D⊕ +4°.2 D 18".4



AUG. 10, 03:45 U.T.
8" RFL, 325X
WRATTEN #25 RED FTR.
CM 181° ⊙ 212°
D⊕ +4°.0 D 18".1



AUG. 21, 05:40 U.T.
12" RFT, 300X
WRATTEN # 25 RED FTR.
CM 106° ⊙ 218°.9
D⊕ +2°.7 D 16".4



AUG. 24, 03:20 U.T.
6" RFT, 318X
WRATTEN # 25 RED FTR.
CM 44° ⊙ 220°.7
D⊕ +2°.2 D 16".0

regions may have played a part in making them appear lighter. See further the report on Clouds, Obscurations and Light Areas which appeared in the Sept.-Oct., 1954 issue of The Strolling Astronomer and forthcoming reports.

[Full pages of Mars Drawings. Mr. Avigliano is kindly sending us a number of full pages of drawings of Mars in 1954 by different observers. The first of these appear on pages 38, 39, 40, and 41; and others will follow in future issues. These drawings were not originally prepared for The Strolling Astronomer, and some of the abbreviations may need to be explained. Here RFT. means refractor, and RFL. means reflector. E.A. means effective aperture; it is the practice of the Lowell Observatory to employ the 24-inch refractor at less than its full aperture. Filters (FTRS.) were often employed by the two observers whose work is presented here. It will be noticed that Mr. Capen's observations are reported in Mountain Standard Time rather than in Universal Time. C.M. means central meridian of longitude. The symbol ⊙ is the areocentric longitude of the sun, so chosen as to be 180° at the vernal equinox of the southern hemisphere. The symbol D⊕ is the Martian latitude, plus when north, of the center of the disc. D is the apparent angular diameter of the planet. - Editor.]

AN OBSERVATION IN THE PHILIPPINES

OF THE TOTAL SOLAR ECLIPSE ON JUNE, 20, 1955

We have been pleased to receive several photographs of the total eclipse of the sun on June 20, 1955 from Mr. Hans Arber, P.O. Box 125, Manila, Philippines. An enlargement of one of his photographs is shown here as Figure 17, and the 4-inch refractor with which he took it is shown as Figure 16. Mr. Arber worked in collaboration with Professor Waldmeier of the Swiss Federal Observatory at Zurich, Switzerland and Dr. Rosario, Director of the Philippine Weather Bureau.

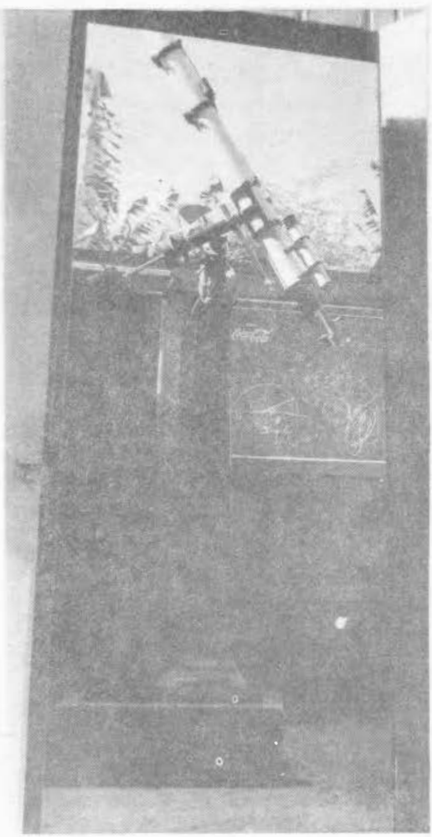


Figure 16.
4-Inch Refractor at Private Observatory of Hans Arber, Manila, Philippines.

Mr. Arber writes that he obtained eight corona exposures of good quality with the 4-inch refractor and also took 100 feet of 8 mm. film with a 2-inch telephoto lens from first contact until a few minutes after totality. Heavy clouds then covered the sun, and last contact could not be observed. Mr. Arber thinks that exposures of one-tenth to one-half of a second with the 4-inch refractor would have shown the solar prominences. He had some of the comic-tragic experiences that beset observers of eclipses; the shutter jammed for a moment on some time exposures, and the darkness of the eclipse was so unexpectedly great that it was necessary to take precious time to find a flashlight. Nevertheless, he feels that his long and careful preparations for the eclipse were well rewarded.

Students of the sun may wish to compare Figure 17 to the photograph of the eclipse on June 30, 1954 in our July-August, 1954 issue.

Our Philippines colleague invites comment from other A.L.P.O. members about his work on this eclipse. It seems to us that his photographs of the corona deserve much praise.

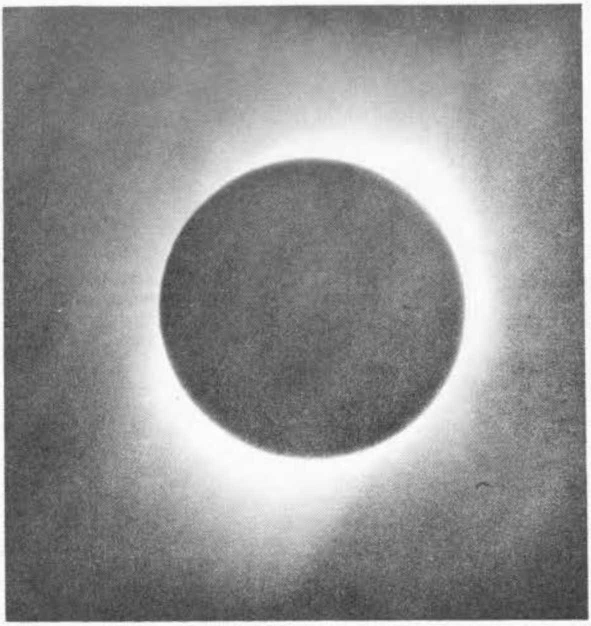


Figure 17. Photograph of the Total Solar Eclipse on June 20, 1955. Taken by Hans Arber, Manila, Philippines, with a 4-inch F: 15 Refractor. 4^h 22^m, U.T. Royal Pan Sheet Film. Exposure 4 Seconds.

BOOK REVIEWS

The Elements of Chromatography, by T. I. Williams, M.A., B.Sc., D. Phil., F.R.I.C.; Philosophical Library, New York; 1955; 90 pages including numerous illustrations; $3.75.

Reviewed by James C. Bartlett, Jr.

This is the kind of book which must make Ph. D's of archaic vintage somewhat uneasy, for they must wonder how well they would do in a modern entrance examination which included subjects not even mentioned in their day. For instance as late as 1940 Babor and Lehrman, in their General College Chemistry, do not mention chromatography. Hence one of the real surprises of Dr. Williams' little volume is his demonstration that the principles of the art were known as far back as 1850 and practiced to some extent ever since. A fascinating note on a method used by Pliny to detect iron on papyrus suggests that even the ancients may not have been entirely ignorant of the method.

The Elements of Chromatography opens with an Historical Introduction in which Williams traces the origin of the art to empirical practice in the dyeing industry. From this humble beginning one is led to see how the subject came to be taken up by various workers in unrelated fields, including botany, who were quick to see its application to their specialties. One is also surprised to learn that a respectable literature developed early, only to be for the most part forgotten. The reason why chromatography has recently come to the fore again, is explained by the author as due to the fact that only recently have there been any large number of chemical problems for which this method is superior to the methods of conventional analysis.

The nature of chromatography and its modern methodology are simply and lucidly explained in three separate chapters, each dealing with one of the three principal forms: adsorption, partition, and ion-exchange. Understanding is greatly assisted by a number of very fine colored plates, photographs in black and white, and line cuts. Miscellaneous forms of the art are considered in another chapter, while two more are devoted to special techniques dealing with the treatment of colorless substances and development. The concluding chapter depicts chromatography in modern industry with some hints as to future developments.

This is a very satisfying book for those who desire an elementary introduction to the subject. The style is clear and the writing is both scientifically sound and unpretentious. One is grateful for the absence of verbosity and the lack of obscurity, both of which mar so much of scientific literature in our day. This is a book to be read with pleasure as well as profit. In passing it should also be remarked that the publishers have done a better than average job for the author. The typography is sharp and easy on the eye, and the printing is done on coated paper of good quality. Illustrations - particularly the colored plates - are excellent.

One must also mention another excellence. At the end of each chapter there is given a relevant bibliography, while a general bibliography follows the last chapter. Thus the serious student may use Dr. Williams' little volume as a springboard to a more comprehensive knowledge of the subject.

The technical competence of this work can be properly evaluated only by chemists who specialize in chromatography, but one suspects that their verdict would be highly favorable.

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Time Counts, by Harold Watkins; Philosophical Library, New York; 1954; 274 pages. $4.75.

Reviewed by Walter H. Haas

This book is frankly propaganda that the Gregorian Calendar now in use in most of the civilized world should be replaced by the World Calendar, sponsored by the World Calendar Association International and with U.S. headquarters at 630 Fifth Ave., New York 20, New York. As astronomers and as citizens of a republic we should give our intelligent attention to this proposal. We may fairly ask, then, just what are the defects of the Gregorian Calendar and just how will the World Calendar remove them or lessen them.

The natural units of time are the day, the month, and the year. Unhappily, they are quite incommensurable with each other; there is never exactly a whole number of days, or of months either, in any whole number of years. Calendar-makers, of course, have used approximations, such as Julius Caesar's 365¼ days in a year. The confusion is increased by that rather arbitrary unit of time, the week. However, the error in the length of the year in the Gregorian Calendar, introduced by Pope Gregory XIII in 1582, is only about one day in 3,000 years, surely small enough to be of no immediate concern. There are certain other defects, though: the months are of different lengths, the same is true of the quarters of the year, a particular day of any given month falls on different days of the week in different years, and the number of working days (non-Sundays) in a month varies from 24 to 27. The last-named can be of considerable statistical and economic importance; the volume of sales in two Julys, one with 26 working days and the other with 27, may be expected to differ on that account by about 4%. (Greater complications can and do occur if Saturday is of more business importance than the days from Monday to Friday.)

The World Calendar divides the year into four equal quarters, beginning with January 1 as a Sunday. January has 31 days, February 30, and March 30. April, May, and June repeat the 31-30-30 pattern; and since there were 91 days or 13 weeks in the first three months of the year, April 1 is on a Sunday. Thus we have a perpetual calendar with equal quarters and with, for example, every July 4 on Wednesday and every November 11 on Saturday. There are only 364 days in the four quarters; therefore, it is proposed to introduce December 31 or W at the end of each year and June 31 or W between June and July in leap years. These might be World Holidays. Every month has 26 working days.

The World Calendar Association has made heroic efforts to persuade the governments of the world to adopt this calendar. These attempts have largely met with apathy, certainly in the United States. Perhaps the chief objection to the World Calendar is the familiar one that people dislike change. Certain religious groups have pointed out that the sequence of seventh-days is broken in this proposed calendar. It was broken when the Gregorian Calendar replaced the Julian, and it is broken now for everyone who crosses the International Date Line.

This imperfect summary scarcely does justice to Mr. Watkins' entertaining, informative, and really delightful book. The opening chapters describe the historical development of the calendar among different peoples. Many early calendars were lunar calendars, and the Moslems use a lunar calendar with a 354-day year today. The adoption of the Gregorian Calendar in England in 1752 is discussed. The writer questions the reality of the "riots" said to have accompanied the dropping of 11 days in order to make the change. The modern history of calendar reform proposals before the League of Nations is treated in detail, and recent debates in Parliament are reported. The League of Nations Committee actually considered some hundreds of possible calendars, most of them doubtless too novel for adoption. One scheme was for a year of 9 months, each with 40 days; and another abolished months and numbered the days from 1 to 365. The League was eventually to conclude that only the World Calendar was a practical solution. Mr. Watkins stresses that calendar changes, no matter how logical and worthy in themselves, which involve great changes in people's habits have little chance of adoption. Thus the French Revolution Calendar with equalized months and decimal subdivisions of the day lasted only 13 years, and Russian experiments in 1929 and later with a five-day week eventually came to nothing. On this basis a year beginning at an equinox or a solstice, however appealing to astronomers, would probably not succeed in practice.

Time Counts will not succeed in its goal of changing the calendar in 1956, when January 1 is a Sunday in both the Gregorian and the World Calendars. It has, however, persuaded this reviewer that the World Calendar is a desirable innovation; and he recommends the book to all persons interested in the matter.

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The True Book About The Stars, by H. P. Wilkins; Frederick Muller Ltd., London; 1954; 135 pages and many illustrations. 6 shillings.

Reviewed by Walter H. Haas

This book is written for children, say those from 12 to 15 years old. It is certainly a good introduction to astronomy and would be a splendid birthday or Christmas gift for a teen-ager. Indeed, an adult just beginning to study astronomy can find much useful information and many interesting sidelights in this little book. The author is our colleague, Dr. H. P. Wilkins, the Director of the Lunar Section of the British Astronomical Association. His visit to the United States in 1954 will be pleasantly remembered by many A.L.P.O. members who heard him lecture then.

The style of the book is easy and clear, and it appears to be remarkably free of errors. The order of presentation of material is fairly conventional: the earth, the sun, the moon, the planets, comets and meteors, the stars, and clusters and nebulae. Lunarians will be especially interested in a drawing of the environs of Copernicus on pg. 34, made by Dr. Wilkins with a large telescope (probably the Meudon 33-inch refractor); there are shown a host of small, shallow crater-pits on the outer walls of Copernicus and as far west as Stadius, many of them apparently located on radial lines pointing toward the center of Copernicus. There is a rather long chapter on constellation study and one on the telescope, the book ending with some simple and brief instructions for making a small refractor. We commend the book to Junior Astronomers.

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The True Book About The Secret Service, by Ronald Seth; Frederick Muller Ltd., London; 1953; 142 pages and many illustrations. 6 shillings.

Reviewed by Walter H. Haas.

Though this book has nothing to do with astronomy, we enjoyed reading it and we are sure that many of our members would also enjoy it. Like Dr. Wilkins' book, it is written for teen-agers. The writer was himself a British Secret Agent in World War II. He describes such techniques of spying as the use of secret inks and codes, disguises, the training of spies, and the composition and working of a spy-ring. It may come as a surprise to many to learn that Daniel Defoe, the author of Robinson Crusoe, was also the founder of the modern British Secret Service.

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OBSERVATIONS AND COMMENTS

Posidonius and Brayley. J. E. Westfall drew Posidonius on January 10, 1954 at colongitude 335°.8 with a 4-inch refractor at 180X. A curious aspect of his drawing is a black band of shadow running east-west and located in the north part of the floor. Although this band agrees well in position with a known cleft, it is shown to be far wider than any other cleft. Mr. Westfall drew Brayley and vicinity on January 15, 1954 at 36°.4 with a 4-inch refractor at 180X. Brayley is a small crater in the Mare Imbrium on Section V of the Wilkins map. Under the low lighting prevailing the drawing shows a number of black lines, probably the shadows of very low ridges; but it is difficult to confirm these on the Wilkins map. The detection of such features often depends upon having just the right solar lighting.

Uranus. A remarkable amount of work on this distant planet was carried out in February-April, 1955 by Owen C. Ranck with a 4-inch refractor and by Leonard B. Abbey, Jr., with a 6-inch reflector. Figures 18, 19, and 20 are perhaps typical of their best results. On April 3, 1955 both observers quite independently drew Uranus, Mr. Abbey at $2^h\ 30^m$, U.T. (Figure 20) and Mr. Ranck at $2^h\ 45^m$, U.T. Their agreement is very good indeed; for each one saw a white area on the southeast limb, a duskiness of the rest of the limb, and nothing more. Refer also to Figures 17 and 18 on pg. 148 of our November-December, 1954 issue. Mr. Ranck draws on Uranus what appear to be belts parallel to the equator, sometimes a white spot and sometimes a dusky area upon the earth-turned pole, frequent bright areas in the zones between the belts (Figure 19), and sometimes a bright crescent along the west limb (Figure 19). Mr. Ranck interprets this last feature as part of a white Equatorial Zone. There thus appear to be strong analogies between Uranus and Jupiter and Saturn and some evidence that detail on Uranus is rather variable.

It would be most excellent if this very promising work on Uranus can be confirmed with larger telescopes. Perhaps Messrs. Ranck and Abbey have shown us that a few years of intensive study can accomplish more than have decades of rather casual looking.

Plato. Among the current observers of this famous walled plain are L. B. Abbey, Jr. (6-inch refl.), W. F. Barber, Jr. (3.5-inch and 6-inch refls.), P. W. Budine (3.5-inch refl.), A. K. Herring (8-inch refl.), and R. Oxford (4-inch refr.). Our nomenclature for the markings on the floor of Plato follows that of Figure 21, a preliminary but very laudable map of Plato constructed by Elmer J. Reese some years ago. Mr. Herring saw A and C as shadow-holding craterlets on February 1, 1955 at colongitude 13°.8 and on April 1, 1955 at 11°.9; he found no visible floor detail on December 15, 1953 at 20°.3 but probably only because the transparency was extremely poor. Besides Herring, Barber and Budine also drew Plato on April 1, 1955. Barber saw no detail on the floor; Budine suspected two white spots and two dusky ones, but they do not agree with Herring's drawing or with maps. Budine did, however, record many bright ridges on the east and southeast walls, two small craterlets and a mountain on the north wall, two mountains just outside the northwest rim, and two shadow-filled valleys running north and west from Plato to two mountains. He also remarked a whitening of the south-

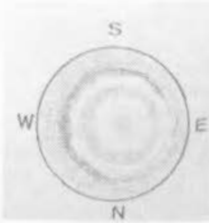

Figure 18. Uranus
Owen C. Ranck.
4-inch refr.
March 24, 1955.
$0^h\ 20^m$, U.T.
Seeing fair.
Sky clear.

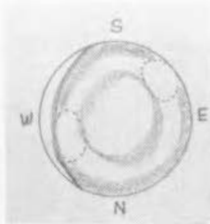

Figure 19. Uranus
Owen C. Ranck.
4-inch refr. 300X.
April 11, 1955.
$1^h\ 5^m$, U.T.
Seeing good.
Sky very clear.

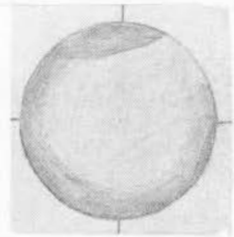

Figure 20. Uranus
Leonard B. Abbey, Jr.
6-inch refl. 300X.
April 3, 1955.
$2^h\ 30^m$, U.T.
Seeing fair.
Transparency very poor.

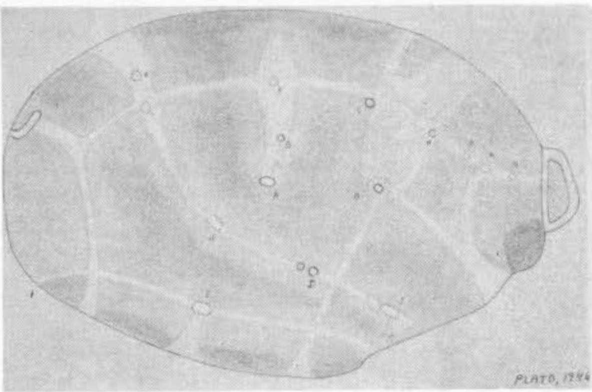

Figure 21.
Preliminary Chart of
Plato in 1946-7 by
Elmer J. Reese.
Based on 14 drawings
with a 6-inch Refl.

east corner of the floor at $3^h\ 0^m$ U.T.; but this whitening was not drawn by Herring at $3^h\ 45^m$ or by Barber at $0^h\ 34^m$. Oxford drew A, C, and D (single) as whitish spots on April 4, 1955 at colongitude $47^\circ.6$. Abbey saw A as a shadow-holding craterlet and B as a mere spot on January 3, 1955 at $19^\circ.2$. It is a severe test of a 6-inch telescope to see the craterlets as such and not just as spots.

<u>Proposed Systematic Search for Possible Lunar Meteors</u>. In recent years Mr. Robert M. Adams has been our most active member in searching for possible lunar meteors and possible lunar meteoritic impact-flares. We might remind our newer readers that if the moon has no atmosphere, the meteorites striking its surface at cosmic velocities will give rise to impact-flashes easily observable from the earth. However, an exceedingly thin atmospheric blanket, one not discoverable by most methods of investigation, will suffice to destroy many of these meteorites or at least to reduce their velocities enough that they can cause only dim impact-flashes. There will also thus result lunar meteors visible to us as brief and short streaks against the lunar surface and inconspicuous in ordinary telescopes. Now it is quite certain that meteoritic impact-flares are <u>not</u> recorded in appreciable numbers, and in addition a number of A.L.P.O. members <u>have</u> reported what certainly appear to be lunar meteors. It is thus important to watch the moon for such objects; except for the unusual opportunity of a total eclipse of the moon, we shall do best to observe the earthlit areas when the moon is a narrow crescent. In June, 1955 Mr. Adams wrote in part as follows: "Of about 30 searchings for flashings averaging half an hour apiece, there were only two very momentary occasions that I <u>thought</u> I saw flashes ...... These were so brief that I consider it possible they might be labeled subjective phenomena ...... I have a proposal to make on this subject of lunar flashes. I would be willing to undertake the leadership [on a tentative basis] of such a project. Before such a project could be effective, it would seem that there should be a number of people who would agree to observe

at stipulated times. A time schedule could be worked out in advance so that it would be certain two or three people were observing at the same time. It would be natural that only a small fraction of the observers would be working at the same time because of other duties, weather conditions, etc. Fairly accurate time should be kept but not necessarily precisional time because the location of the object by two observers would clinch the identity of the object."

We very heartily commend Mr. Adams' suggestion to A.L.P.O. members. Certainly the skeptic will be very doubtful that lunar meteors exist until one has been observed independently by two observers. Certainly such a duplicate observation is not likely to be made by chance; it will instead require very careful planning. But if one were made, it would be a very real achievement for our A.L.P.O. Mr. Adams invites all seriously interested readers to write to him at 324 South Valley, Neosho, Missouri.

Walter. Mr. Kelly's drawing of this lunar walled plain on pg. 125 of our September-October, 1954 issue encouraged two other A.L.P.O. members to make drawings. Mr. Donald Rosenfield sketched Walter on April 1, 1955 at colongitude $11^{\circ}.6$ with a 10-inch reflector; and Mr. Bill Hartmann did so on April 2, 1955 at $23^{\circ}.6$ with a 2.4-inch Unitron refractor. Hartmann shares Kelly's impression that the highest part of the triangular area in the northwest part of the floor is its southeast corner, the one facing the center of Walter; in fact, Hartmann and Rosenfield draw a sharp hill rising there. With higher solar lighting than the other two observers had, Hartmann remarked several bright rays on the floor of Walter. Rosenfield with a larger aperture than the other two observers resolved the triangular area into craters and hills.

Herodotus. On April 5, 1955 at colongitude $59^{\circ}.7$ R. Oxford drew this ring-plain with a 4-inch refractor at 180X and poor conditions. He saw no sign of Dr. Bartlett's pseudo-peak; the floor was a uniform gray. R. M. Adams on May 4, 1955 at $53^{\circ}.0$ with a 4.3-inch refractor found almost all of the floor in shadow; he speaks of a "faint diffuse light" near the east wall, which had become brighter and larger by $53^{\circ}.6$. The manner in which the light spread interested Mr. Adams very much, but it may be a normal development.

"An Unusual Sky Phenomenon". Under this title the leading article in Vol. 2, No. 25 of Vega, Mr. R. M. Baum's excellent publication, describes a really amazing observation by Mr. Harold Hill, Dean Brook House, Abbeylakes, Near Wigan, Lancashire, England. Whatever one may think of "flying saucers" - and it is perhaps difficult by this time to say much new about them - we here have a careful observation by an outstanding lunar observer of more than twenty years' experience in astronomical work. Mr. Hill will give his own opinion as to what was seen upon request. We here summarize from Vega the observation itself.

On July 8, 1954 near $20^{h}\ 30^{m}$, U.T., at his observatory in Abbeylakes Mr. Hill suddenly noticed at an altitude of about 55° in the southern sky a bright, apparently stationary, star-like object. With 33X and 50X on a 12-inch reflector the "star" was resolved into a bright silvery object of indeterminate shape, accompanied to the left by a loose cluster, with perhaps 15 to 20 members, of what appeared to be minute stars of varying magnitudes. These were constantly moving about, a "hive of activity". After a short break caused by clouds, Mr. Hill saw two bright objects close together. The cluster had vanished, though perhaps merely outside the field of view of the telescope. "My attention was directed to the two bright objects which showed sensible motion. They were separating as I watched and not only appeared to be gyrating and flashing but also exhibited a slow pendulum movement about each other in a manner similar to dancing partners! The increased movements of the objects made following with the 12-inch a difficult affair, and they passed out of the field as an adjustment had to be made to the telescope." They were also lost to Mrs. Hill, who had been simultaneously watching with binoculars. Clouds ended the observation at $20^{h}\ 55^{m}$, U.T. Mr. Hill's impression was that the objects were at a very great height. "The two principal members defied description, they flashed as they gyrated as though metallic surfaces were reflecting the rays of the Sun (now below the horizon). Probably the closest analogy to what was seen is to be found in the flashing of the facets of a diamond as it is turned in strong light."