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 contrast 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.

Concerning This Issue. Readers will observe a number of changes in the format of this issue of The Strolling Astronomer as compared to immediately preceding issues. These have been made with the objective of reducing costs. Like many other astronomical projects, The Strolling Astronomer operates on a very limited budget; and the extreme lateness of recent issues has been due in part to financial difficulties. We hope and think that the changes made have been accomplished without any decrease in the quality of our periodical, either in the clarity of the illustrations or in the amount of material published. We shall be glad to hear from you, our readers, how you like our"new face".

We might mention that it will obviously be some time before the mailing of The Strolling Astronomer can be brought back into step with the calendar months. We assure both old and new readers that in spite of this regrettable situation every subscriber will eventually receive that number of issues for which he has paid.

Reutlinger Sternenbote. Such is the title of a German publication with which we have recently begun to exchange. We are sure that A.L.P.O. members able to manage German will find much enjoyable and instructive reading therein. The July-September, 1954 issue (Volume 5, Nos. 7 - 9) contains 24 pages of text of about the same size as those in The Strolling Astronomer and a cover picture of the partially eclipsed sun on June 30, 1954, taken by Mr. J. Herrmann with the 7-inch reflector at the Reutlingen Observatory. Among the articles in this issue are ones upon the Zeiss Planetarium in the service of archeology, halos around the sun and the moon, the determination of stellar diameters from luminosity and temperature, the building of the Reutlingen Observatory, and the asteroid Hermes. Interested persons should write to Astronomische Station Reutlingen, 14 b Reutlingen, Blücherstrasse 18, Volkssternwarte, Germany.

Important Paper on the Origin of Lunar Craters. We take pleasure in directing attention to a monograph with the title "Formación de los cráteres lunares" published in No. 234 of the Spanish journal Urania in 1953. The author is Mr. A. Paluzie-Borrell of Barcelona, one of our A.L.P.O. members and contributors. In what may truly be called a definitive treatment of work up to now on the problem of the origin of the lunar features, Mr. Paluzie in 78 pages discusses comprehensively all the different theories, 11 figures clarifying the presentation. The bibliography of 177 items will alone be of the greatest value to all students of the intriguing and controversial question of how the lunar surface was molded to its present form. Mr. Paluzie's paper is, of course, in Spanish. Might it be possible to translate this treatise into English and to arrange at least a limited distribution?

THE EVIDENCE FOR SATURN'S RING D

by Thomas A. Cragg

Several people in recent years have reported seeing a faint dusky ring outside the normal confines of Saturn's rings. Since there has been more and more concern recently regarding the "new" feature, it was felt necessary to write a paper concerning it. At the suggestion of Walter H. Haas, Director of the A.L.P.O., the "new" feature will be referred to as "Ring D".

First, it should be mentioned that the region containing Ring D is still within the Roché Limit, using his formula:

$$L = 2.4554R$$

where: L = Roché Limit
R = radius of planet.

The history of this feature reveals that it is not new. According to R. M. Baum[1] this feature was first observed by M.G. Fournier at the Jarry-Desloges Observatory on September 5, 1907. Fournier again observed it on Sept-

ember 7, 1907. Even though it was mentioned in several journals at the time, it was announced as a new discovery by M. E. Schaer of the Geneva Observatory in September, 1908.

Following this announcement, Bower, Lewis and Eddington at Greenwich observed it on October 10, 1908. Apparently the last observation made of Ring D was by Schaer in January, 1909. It should be mentioned that E. E. Barnard was unable to detect it with the 40-inch Yerkes refractor when specifically looking for it.

In more recent times E. Schaer suspected it in 1945[2]. R. M. Baum recovered it with a 6.5-inch reflector on April 1, 1952. Mr. T. R. Cave, Jr. recovered it independently in early 1952, and Mr. T. Cragg confirmed him shortly after[3].

In 1954, most of the drawings of Saturn prior to April 20 submitted to the A.L.P.O. show a very dark border on the south side of the projected ring ellipse[4]. The geometry of the system, according to The American Ephemeris and Nautical Almanac, was such that the shadow of the rings on the ball fell north of the projected rings prior to April 20, 1954. Had only a few drawings shown this apparent error, not much would have been thought about it; but since nearly 90% of the drawings showed an apparent shadow on the wrong side, it would seem that something must have been there to cause the trouble. Since this is exactly where one would expect Ring D to be in projection against the ball, it is easy to assume that the error was due to the presence of Ring D. Such was strongly suspected to be the case until April 22, 1954 when a fine view with the Mt. Wilson 60-inch reflector was had by Cragg (Fig.1). This view clearly revealed

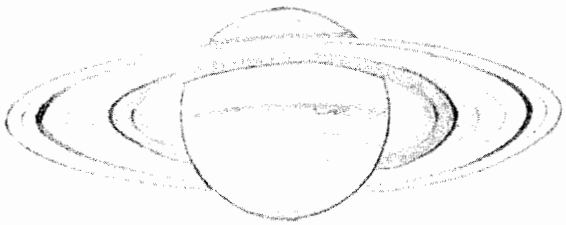


Figure 1. Saturn.
Thomas A. Cragg.
April 22, 1954.
7 hrs., 15 mins.,U.T.
Mount Wilson 60-inch reflector. 250X-700X.
Seeing fairly good.
Sky very clear.

the dusky shading (not a shadow) crossing the ball immediately adjacent to the southern edge of the ring ellipse. A comparison was made between the shadow of the ball on the ring (still visible though very narrow) and the dusky shading, and again the shading was obviously not the shadow of the rings. Through the courtesy of Drs. E. Pettit and R. S. Richardson who were photographing Mars and Saturn on the same night with the 100-inch, a print from one of their negatives was secured showing the same appearance which had been observed visually at the 60-inch.

Several suggestions have been made as to what the dusky band adjacent to the rings could be besides Ring D. One suggestion is that the dusky shading may be the penumbral shadow of the rings, but since the angular diameter of the Sun from Saturn is only 3' of arc, it seems impossible for a penumbral shadow to be as extensive as the dusky band that was observed. Another suggestion has been the possibility of a belt at just the right position to be adjacent to the projected ring ellipse. The specific suggestion was the S.E.B. (South Equatorial Belt). This contention seems impossible because of the previously observed positions of the Saturnian belts. If one computes the Saturnicentric latitude of the south edge of the ring ellipse as seen from the Earth, he finds that during the interval of time pertinent to this problem it varied from 29° to 27° South. It is a little hard to visualize an equatorial belt in this latitude.

It seems that an observation by Cragg on June 5, 1954 with a 12-inch reflect-

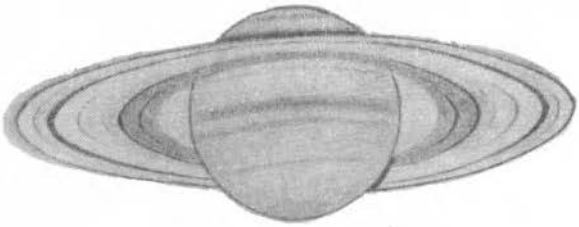


Figure 2. Saturn.
Thomas A. Cragg.
June 5, 1954.
6 hrs., 50 mins., U.T.
12-inch reflector.
168X, 200X, and 336X.
Seeing fairly good.
Sky very clear.

or would settle the issue (Fig 2). By this time a prominent shadow of the rings on the ball was visible south of the ring ellipse, but in this view a faint dusky shading was seen beyond the shadow. This may be interpreted as the penumbral shadow of the rings, but Ring D was seen definitely off the ball. This aspect was confirmed by another observer with a 6-inch reflector without foreknowledge of the position of Ring D.

In looking for Ring D certain facts and precautions should be remembered:

1. Ring D is fainter than Ring C by a factor of a little less than 2.

2. Unless Ring C can be seen rather easily in the ansae, Ring D will probably be invisible.

3. There is a remarkable similarity between Ring D and a "fast seeing pattern". The "fast seeing pattern" appears as a faint fuzzy border to the ring system but surrounds the ball also. Obviously, Ring D appears as a miniature Crape Ring outside of Ring A.

4. The visibility of the "new" ring may well vary due to the changing inclination of the rings to the Sun and Earth.[5]

In connection with item four, it should be mentioned that the inclination of the rings was 0° twice during 1907, but about 1° at the time when Fournier discovered Ring D. If Ring D is made up of homogeneous particles, the apparent density of the particles as seen from the Earth would vary inversely with the inclination angle. In addition to this one must remember that the irradiation of Rings A and B would increase directly with the inclination angle to the Sun. With these data in mind it appears that Ring D has a better chance of being detected at low ring inclination angles.

Some readers may be interested in the calculation of the latitude of the south edge of the projected rings as referred to above. This subject has been treated by T. Cragg in the Proceedings of the Astronomical League General Convention at Madison, Wisconsin on July 2-5, 1954, pp. 39-41. Here the equations are developed for both an assumedly spherical Saturn and for the actually ellipsoidal planet. If R is the outer radius of the rings, r the radius of a supposedly spherical Saturn, B the Saturnicentric latitude of the Earth, and L the desired Saturnicentric latitude of the outer edge of the ring ellipse, then it is easily shown that:

$$\sin A = \frac{R \sin B}{r}$$

$$L = 180^{\circ} - A - B ,$$

where A is an auxiliary angle. For the actual planet a much more complicated formula leads to almost the same computed latitude.

References

1. Vega , Nos. 12 and 13, pg. 52, Jan. 31, 1954.

2. Private communication from E. Schaer.

3. The Strolling Astronomer, Vol. 6, pg. 160, Nov. 1952

4. The Strolling Astronomer, Vol. 8, pg. 31, March-April 1954.

5. The Strolling Astronomer, Vol. 8, pg. 33, March-April 1954.

Footnote by Editor. One may wonder whether the dark border south of the projected ring-ellipse prior to April 20, 1954 was the shadow of Ring D rather than the Ring D projection upon the ball. It has been found that the Crape Band on the ball of Saturn is at least at times a shadow rather than the projection of Ring C (The Strolling Astronomer, Vol. 3, No. 1 pp. 5-7, 1949). Perhaps it is significant that Cragg writes of seeing the supposed Ring D against the ball to be almost as wide as Ring D at the ansae; for the shadow of D lay south of the projection of D on the ball subsequent to April 20, 1954 (but north of it before that date). The true Ring D projection was less than one-third as wide as Ring D at the ansae during the 1953-54 apparition of Saturn.

MARS

by W. D. Heintz

In the 1954 apparition Mars was in a very favorable position for southern observers. At Mt. Stromlo Observatory (Canberra, Australia), the planet came within 7° of the zenith. From the work which was done here, we show five sketches covering almost the entire surface; and the names of the various regions given in the following description are those from Antoniadi's Mars map as reprinted in "Sky and Telescope", June, 1954.

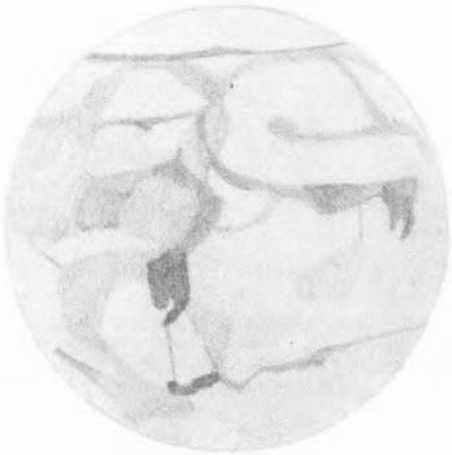


Figure 3. Mars.
W. D. Heintz.
July 4, 1954.
14 hrs. 25 mins. U.T.
9-inch refractor.
320X, 570X.
C.M. = 310° .
Seeing Good.

Fig. 3 shows the characteristic shape of Syrtis Major, extended to N.W. by Nilosyrtis and Nilus. East of it, Thoth-Nepenthes and Casius are seen as a wide, curved band. [Dr. Heintz uses west to mean the direction of increasing longitude on Mars, east, the opposite direction.] Sinus Sabaeus lay in the -

West, with the two tips of the Fork Bay at the end, and Portus Sigaeus, mouth of Phison, in the middle part. Ausonia and Hellas (S.E.) consist of several parts of different brightness, between which Mare Tyrrhenum and Mare Hadriacum are to be seen. The Aeria region, W. of Syrtis, is very bright, except for the shade of Asopos.

Figure 4. Mars.
W. D. Heintz.
August 1, 1954.
10 hrs. 25 mins. U.T.
9-inch refractor.
320X, 570X.
C.M. = 0°.
Seeing very good.

Fig. 4: Sinus Sabaeus is in the middle of the disk, with its mouth into the Hellespontus at the E. end, the Fork Bay at the W. , and Portus Sigaeus in the middle. Hellas is seen as a bright area near the S.E. limb. The darkness of Margaritifer Sinus diminishes in the dimmed light of the terminator side. Near the North Polar Cap, Deuteronilus, Oxus and Indus form a triangle. It will be noted that the bright region N.E. of the Fork Bay (Aeria and Arabia) is seen differently from Figure 3.

Figure 5. Mars.
W. D. Heintz.
June 18, 1954.
12 hrs. 15 mins. U.T.
9-inch refractor.
320X, 570X.
C.M. = 60°.
Seeing good.

Fig. 5: Aurorae Sinus is in the middle, connected by Ganges with the very faint Lunae Lacus north of it. To the W. is Tithonius Lacus, S. of it the remarkable Solis Lacus; the surrounding bright region Thaumasia, being divided by some canals. In the E. Sinus Furcosus and the characteristic curve of Margaritifer Sinus are disappearing. The following dark region of Mare Erythraeum contains the slightly brighter areas of Pyrrhae Regio and Argyre. Mare Acidalium in the North seems to consist of some parts of different darkness.

Figure 6. Mars.
W. D. Heintz.
July 27, 1954.
16 hrs. 30 mins. U.T.
9-inch refractor.
320X, 570X.
C.M. = 135°.
Seeing fair.

Fig. 6: Mare Sirenum lies in the S., with its N. end, Titanum Sinus, close to the terminator. In the E. Tithonius Lacus is connected by Gordii Nodus with Mare Sirenum. In the S.E. parts of Solis Lacus and Thaumasia are still visible. In the middle and W. parts the bright regions are Tharsis and Amazonis. The grey shades there drawn are very uncertain because they are close to the terminator. The Northern Cap is seen divided into two parts.

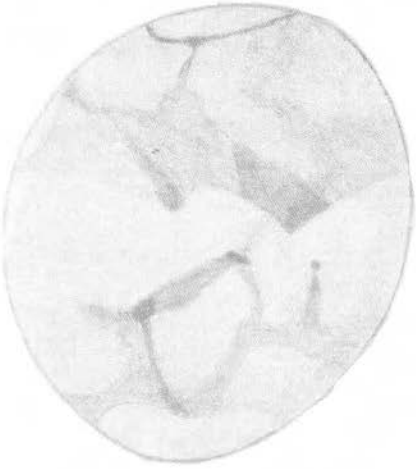


Figure 7. Mars.
W. D. Heintz.
August 14, 1954.
9 hrs. 20 mins. U.T.
9-inch refractor.
320X, 570X.
C.M. = 225°.
Seeing very good.

Fig. 7 shows Mare Cimmerium and its two "creeks", Cyclopum Sinus (W.) and Laistygonum Sinus (E). Between Eridania and Electris, the Scamander canal comes from the South Cap. In the middle lies the bright region Aeolis, N. of it Cerberus and its dark edges: Pambotis Lacus (W.) and Trivium Charontis (E.). In the North, Elysium (very bright) is bounded by Hyblaeus (W.) and Styx (E.). As in most sketches, the melting Southern Polar Cap shows a distinctly dark border, while the increasing Northern one is seen without such a frontier.

The drawings were made with a 9-inch refractor, using eyepieces of 320X and 570X. They should allow a rough view of what one may expect to see in the more favorable 1956 apparition.

For drawing up a program of observations for that next apparition the following remarks may be useful: The usual, convenient diameter of sketches is about 3 ins. so that lines drawn by chance cannot get too much weight. For drawing the planet, it is recommended to wait a few minutes until the eye gets used to the reddish-yellow color. Also, one should not strain the eye by continuing the observation too long in order to avoid seeing features which are not real. It is better to leave the sketch unfinished and to repeat it on some other night. This remark concerns mainly some surface regions (Solis Lacus, Syrtis Major) where the markings are so close together that their separation meets with difficulties even under good conditions. There are warning examples of observations hopelessly disfigured by physiological errors.

Refractor observers should be very cautious about remarks on colors of the Martian regions unless they are sure about the color correction of their instrument. Furthermore, one should never study a Mars map before or during the observation. Certainly, it gives great pleasure to identify the features seen with those from the map; but it must be specially mentioned that uninfluenced work cannot be done in this way. The author did not compare his sketches with any map during all the months of observations this year. Some of the features of the above drawings or older ones may have changed in shape considerably before the 1956 apparition.

Observers should never hurry the drawings but should patiently await moments of good seeing in order to perceive the faint details. A well-completed sketch usually needs at least half an hour of work. However, it is recommended not to spend too much time on simply drawing. The surface details visible in small telescopes are mostly well known, and compilation of too many observations, especially from insufficient telescopes, is superfluous. After having got some sketches under good seeing conditions, the main attention then may be paid to changes of the formerly drawn markings: variation of the brightness of areas, of the width of the dark bands, etc. These changes are probably due to seasonal variations of the Martian atmosphere and may become remarkable after opposition when the planet comes to a more northern declination. Especially the size of the polar caps may be continuously investigated by estimating their width in units of the diameter of the disk.

Some work can be done by color filter observations as the transmission of the Martian atmosphere is probably different in diverse colors. For such observations, the reader is referred to the article "The Filter" by J.C. Bartlett, Jr., in "The Strolling Astronomer", April, 1953. All kinds of information about the red planet may be drawn from the book "The Planet Mars" by G. de Vaucouleurs, which is now obtainable in the English language.

A very useful contribution, however, can be done even with smaller telescopes, namely, observations of selected surface markings passing the central meridian of the disk. Such transit times reliably observed are valuable for checking the rotation period and phase of Mars, if the chosen transit stations are sufficiently determinable in longitude. There are needed only a few surface points, but these should be timed as often as possible. Stations recommended for transit observations, fairly close to the Martian equator, and distributed over all longitudes, are as follows (the approximate longitude and latitude being given in parentheses):

1. Aryn, the bright gap between the prongs of the Fork Bay. It is chosen as the Martian zero meridian ($0^{\circ}, -5^{\circ}$)
2. Aurorae Sinus, west tip ($60^{\circ}, -10^{\circ}$)
3. Solis Lacus, center ($90^{\circ}, -30^{\circ}$)
4. Titanum Sinus, the northern end of Mare Sirenum ($170^{\circ}, -15^{\circ}$)
5. Trivium Charontis, center ($200^{\circ}, +15^{\circ}$)
6. Cyclopum Sinus, northwest end of Mare Cimmerium ($230^{\circ}, -15^{\circ}$)
7. Syrtis Major. north tip ($290^{\circ}, +25^{\circ}$)
8. Fortus Sigaeus, at the northern side of Sinus Sabaeus ($330^{\circ}, -5^{\circ}$)

The easiest stations are Nos. 1, 2, 4, and 7; the other ones are less contrasty or less sharply determined in longitude. The above list is taken from a recent communication of Dr. de Vaucouleurs ("Journal of the Astr. Soc. of Victoria", Melbourne, April, 1954), except that Syrtis Minor, which was very unremarkable during the 1954 apparition, has been replaced by two other stations.

The observations should be done using a clock checked against time signals. Remarks on seeing, size of telescopes, eyepiece, etc. are useful for judging the reliability of the times.

But how to determine the central meridian? This may be done by estimating the line bisecting the area of the disk and the polar caps. This method must make allowance for the eccentricity of the caps. Another method is as follows: In a fixed telescope, the planet gives the E.-W. direction by its motion. The perpendicular line is N.-S. (the earth meridian at the position of Mars); and the position angle of the rotational axis of Mars (which equals the direction of his central meridian), reckoned from north towards east, may be taken from the "American Ephemeris". This method is more difficult, for it needs some experience in estimating angles; but if the observer is fairly sure about that, then, as a byproduct, recordings of the eccentricity of the polar caps may be gained. When the phase angle (the defect of illumination) of Mars is large, the difference between the center of the illuminated disk and the true central meridian has to be applied as a correction. The difference of brightness, however, between the illuminated limb and the dimmed light of the terminator side may cause physiological errors in the estimation of the central line. The transit observations therefore are mainly important during the time of small phase angle, say 12 days before and 12 days after opposition. The first trials, however, may be started earlier so that observers are well-prepared for the days of the much promising 1956 apparition.

MARS, 1954-REPORT NUMBER 1, PART 2

by D. P. Avigliano

This report continues with Mars as seen by our observers during the period of October 1953 to June 17, 1954. The observers contributing to this first report were listed at the beginning of Part 1. Since the first part of this report appeared, drawings and reports have been received from the following additional observers:

Mr. F. M. Bateson	8-inch refr.	Rarotonga, Cook Islands
Mr. E. E. Hare	12-inch refl.	Owensboro, Ky.
Mr. F. Salomon	8-inch refl.	Haifa, Israel
Mr. C. J. Smith	6 and 20-inch refrs*	Oakland, California.
Mr. C. W. Tombaugh	24-inch refr.**	Flagstaff, Ariz.

*20-inch refractor of the Chabot Observatory.
**24-inch refractor of the Lowell Observatory.

All dates and times in this report are in U.T.

The South Polar Cap. Very poor views of Mars obtained before April, 1954 show the S. polar area as lighter in tint than the orange desert areas. The first good views of this area were obtained in the first part of April 1954. On April 2 Capen shows the S. polar cap as having a definite outline and on April 4 he shows the S. cap bright but with indefinite outline. During the remainder of April the observers show the polar area as generally white and with somewhat indefinite outline. On a few occasions during April the cap became brighter and more sharply defined as if the clouds or haze over this area had possibly lifted somewhat. On other occasions in April the cap was shown as having a yellowish-white tint.

During May the observers show the S. cap as lighter and generally brighter

than in April, listing it as more white in tint. On May 5 Avigliano shows it as bright white but on the following night he detected a slight yellowish tinge. On May 20 Capen shows the cap as large and with definite outline and on May 24 Cragg lists the S. Cap as bright white.

What is probably one of the finest sets of drawings ever made showing the transitory nature of the clouds over this polar area during the S. hemisphere mid-winter to late winter (L.S. 139°.5 to 177°.5) is that shown in Figure 8.

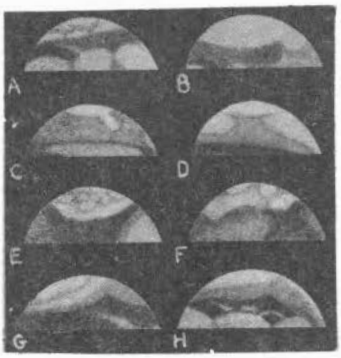


Figure 8.

The south polar cap of Mars from the south hemisphere mid-winter to late winter. From the full disc drawings of Tsuneo Saheki. A-April 2, 1954, B-April 14, 1954, C-April 23, 1954, D-April 30, 1954, E-May 17, 1954, F-May 22, 1954, G-June 4, 1954, H-June 12, 1954. The disc size of Mars during this period varied from 10".0 to 20".5. See text.

This set was taken from the full disc drawings of T. Saheki and it shows in detail the rapidly changing cloud forms over the S. polar area. On June 12 and dates thereafter Saheki shows the normal appearance of a well developed polar cap. On most of the dates in Fig. 8 Saheki shows the area as a bright white. Note especially the mottled appearance of the cap area on May 17 (E-Fig. 8).

In June (up to the 17th) the S. cap was seen by our observers as well developed in form and it was usually listed as either white, very white or bright white.

In summary, the S. cap, when first seen well, was large and probably cloud covered most of the time. Nearing the end of the southern winter the cap appeared to become more and more free of heavy clouds or haze.

The first appearance of the melt-band at the boundary of the S. polar cap was reported by Cave, who wrote, "I first noted the very narrow but definite melt band around the S. polar cap on or very near June 10th. Almost at once rifts were visible after the melt band was first sighted." Cave shows knots or the beginning of rifts in the melt band on drawings of June 11, 15 and 17 (see Fig. 1 in Part 1 of this report). Avigliano suspected the band on June 8, 10 and 11 and saw it on June 12. Bateson shows a very narrow band on June 11 and 13 while on the 14th he shows a well developed band. Westfall shows it on June 13 and 17, Suler on the 15th, Tombaugh on the 16th and Adams and Doucet on the 17th. Saheki shows a faint knotted band on June 16th. Thus we confirm the presence of the S. melt band slightly before the Vernal Equinox of the Martian S. hemisphere. Though the melt band appeared before the S. Vernal Equinox there was no definite lessening of size of the S. polar cap near the end of its winter.

The North Polar Cap. Figure 9, also taken from the full disc drawings of Saheki, shows undoubtedly the only set of observations made by any observer this apparition showing the N. polar cap from the N. hemisphere mid-spring to mid-summer (L.S. 57°.5 to 114°). At the start of these observations the disc of Mars was less then 4 seconds of arc in diameter and these drawings obtained by Saheki are the result of his skill and long experience as an observer of Mars. The diameter of the N. polar cap during its dwindling over this period was measured by Saheki as follows:

	Diameter of N. polar cap
First 10 days of Oct. 1953	1745 kms.
Second 10 days of Oct. 1953	1572 kms.
Last 10 days of Oct. 1953	1545 kms.
First 10 days of Nov. 1953	1465 kms.
Last 10 days of Dec. 1953	949 kms.
First 10 days of Jan. 1954	570 kms.
First 10 days of Feb. 1954	291 kms.

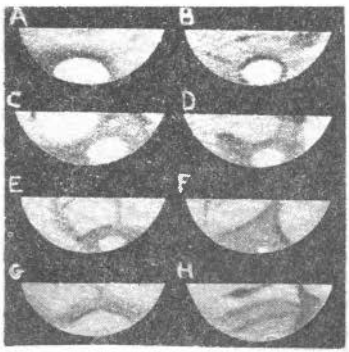


Figure 9.
The north polar cap of Mars from the north hemisphere mid-spring to mid-summer. From the full disc drawings of Tsuneo Saheki. A-Oct. 4, 1953; B-Oct.19, 1953, C-Oct. 29, 1953, D-Nov. 6, 1953, E-Dec. 23, 1953, F-Jan. 11, 1954, G-Jan. 25, 1954, H-Feb. 8, 1954. The disc size of Mars during this period varied from 3".8 to 6".5. See text.

Note the very dark fringe around the cap on Oct. 4 (A-Fig.9) and Oct. 19 (B-Fig 9). On Oct. 29 (C-Fig. 9 , L.S. 68°.5) Saheki noted the disappearance of this fringe and it was not again seen. In color Saheki noted the fringe as, usually, blackish and on one occasion (Oct. 4, 1953) dark bluish-green. On the drawing of Feb. 8 (H-Fig. 9) note the very tiny remnant of the N. polar cap in N. mid-summer (L.S. 114°) and the light haze area surrounding it.

The first record we have of any ofthe other observers seeing the N. cap is on April 2 when it was seen clearly by Capen as small and free of any haze. Capen also saw the N. cap very small but bright on April 4 (see Fig. 2 in the first part of this report). On April 8 Avigliano saw the N. polar area as a dull white.

In May the N. polar area was usually reported as hazy white, whitish or yellow-white. The tiny polar cap was seen shining through arctic haze (not clouds) on May 20 by Capen. Cragg, from observations made on the 24th and 25-th of May, believed the lighter areas he saw in the N. to be due to cloud action.

On June 3 Avigliano saw the N. cap very small and bright apparently shining through a light polar haze (see Fig. 4 in Part 1 of this report). On June 10 (C.M. 18°) Dove reported a small white spot (cloud cap?) and a larger greyish area in the N. polar region while on the same date Avigliano records the area as yellowish (C.M. 62°). On most of the dates in June (up to the 17th) the N. polar area was recorded by our observers as white, faintish white or dull white.

Thus we note the diminishing of the N. polar cap to the very small remnant that was seen comparatively few times during March to June by our observers. The observations indicated growing haze and clouds over this area as the start of N. Autumn (L.S. 180°) was approached.

The majority of the information on the polar caps in this report has been supplied by the following observers: Bateson, Capen, Cave, Cragg, Dove, Hake, Suler, Tombaugh, Westfall and Avigliano. We are especially indebted to Saheki for his most unusual and excellent work done on these areas.

Clouds, Obscurations and Light Areas. A large amount of material has been received on cloud areas. Due to space limitations only the clouds that were observed on more than one occasion or by more than one observer are listed here. A few exceptions have been made when a cloud of unusual interest was seen on one occasion only. The list is arranged in order of date. The observer's name is given in parentheses after each description. The dates covered by this list are from April 2 to June 17. (w-white, y-yellow, bt. - bright, btr.-brighter, cld.-cloud, term.-terminator).

April 2, w area in Candor bordering the Ganges (Capen).

April 2, large w area with diffuse edges over Noachis (Capen).

April 3, w area in Candor (Capen).

April 4, w area in Candor (Capen).

April 4, w area over Noachis (Capen).

April 4, a very small, almost star-like w-grey projection beyond the term. and detached from it. Seen at 12:56 U.T. It appeared to be over the Deucalionis Regio region. It disappeared at 13:20 U.T. (Capen and Tombaugh).

April 7, w area (frost or haze) was seen in Chryse (Tombaugh).

April 7, Noachis region w but not as bt. as in previous observations (Capen).

April 8, possible frost in Isidis Regio region (near term.) (Tombaugh).

April 23, Noachis region lighter y-w (Saheki).

April 30, y term. bulge over the general Zephyria-Aeolis regions (Saheki).

During the first few days of April Tombaugh reports the Noachis and Argyre I regions as w. Noacnis was seen btr. than the S. polar cap up until April 7 when the reverse then became the case (Tombaugh).

May 2, large y-w term. area over Chryse at 10:00 U.T. It appeared to project (Avigliano).

May 5, an unusual whitish equatorial band extended entirely across the disc. Nearly the whole Chryse region was whitish. The band then narrowed passing between Aurorae Sinus and Lunae Lacus, wiping out the Juventae Fons and part of the Ganges. It deviated N. to bypass the Coprates triangle, then back to the equator again to the morning limb of the planet. This whitish band continued to be seen through May 7 (Tombaugh).

May 5, term. swell over Chryse area at 10:00 U.T. (Avigliano).

May 24, bt. limb cld. or frost in the general area of Isidis Regio-Neith Regio at 07:40 U.T. (Cragg).

May 24, bt. limb cld. or frost in the Isidis Regio-Neith Regio regions at 08:40 U.T. (Avigliano).

May 25, the Isidis Regio-Neith Regio cld. or frost (y-w) was recorded as btr. and lighter than on May 24 (07:45 U.T.) (Avigliano).

May 25, the Isidis Regio-Neith Regio cld. or frost seen very prominent at 08:40 U.T. (Cragg).

May 31, Clds in Ulysses area (Capen).

May 31, bt. term. cld. over Ulysses-Gigas junction at 09:10 U.T. (Cragg).

During April and May Tombaugh reports considerable haze activity over the Chryse and Tempe regions.

June 2, at 08:15 U.T. a large w. cld. in the general area of the canal Ulysses. At 10:50 U.T. the area appeared farther S. and as a smaller oval cld. with well defined edges now over the Phoenicis Lacus area (Avigliano).

June 2, Clouds in Ulysses area (Capen).

June 3, bt. w clds in Ulysses area near the term. from 08:15 to 11:30 U.T. See Fig. 4 and accompanying text in the 1st part of this report for details of these clouds (Avigliano).

June 3, Clouds in Ulysses area (Capen).

June 4, Term. cld. area in Ganges region at 08:30 U.T. It appeared to project (Avigliano).

June 5, Term. cld. in the S. portion of Chryse, slightly larger and more diffuse than the June 4 Ganges cld. (Avigliano).

June 6, Prominent term. cld. in Chryse region at 07:00 U.T. (Avigliano).

June 7, greyish-w term. area in the Indus canal and Chryse regions at 07:00 (Dove).

June 8, dull w term. cld. in the Chryse region at 07:15 U.T. It appeared to project at 07:45. At 09:20 this cld. had become btr. and was seen also to cover the general area of the Ganges canal (Avigliano).

June 10, the w area covering the Ophir-Candor regions was seen to consist of a w frost or snow area surrounded by a duller greyish-w haze (Capen).

June 12, w term. cld. over Tharsis at 13:20 U.T.; at 14:15 this cld. appeared to project from the term. At 15:50 the Tharsis patch (very bt. w) appeared more N. than before. This patch could still be seen (though smaller) at 16:45 (Saheki).

June 13, a very w oval limb area over the Niliacus Lacus -Mare Acidalium regions. At 03:50 U.T. it was easily visible, at 04:00 visible, at 04:10 difficult and at 04:15 only a possible trace of it could be seen (Hake).

June 15, very bt. w term. patch over Candor area at 13:25 U.T. At 14:05 this w area extended into the N.W. portion of Thaumasia and it bulged slightly from the term. At 14:50 this area was a bt. w and extended somewhat over Tharsis (Saheki).

June 16, bt. w term. area over Candor and part of Tharsis at 13:30 U.T. This frost or cld. area was still bt. at 14:20 (Saheki).

In the last part of May and the first part of June Capen reports the Ascraeus Lacus area as "covered over with the most remarkable equatorial cloud band"; to Avigliano much of the detail in this general area during these dates appeared abnormally faint, some of it being completely obscured.

Canals. As soon as the first good views of Mars were obtained certain of the canals were apparent. As the disc grew larger they were more easily seen,

some of them as quite prominent band-like markings and others as quite narrow lines. In the following lists of canals observed from December 18, 1953 to June 17, 1954 the canal is listed first; the figures in parentheses following each canal give the approximate meridian of longitude at which the center of the canal may be found; and finally, in some cases, brief comments have been added. Canal and oasis names used in this report are as shown on the 1954 A.L.P.O. map of Mars (this map uses primarily the nomenclatures of Lowell and Antoniadi).

Confirmed canals. In this section are listed only the canals that were independently seen in accurate positions by at least two (usually more) observers.

Acheron (130°).

Adamas (245°). Seen by Capen as a filled-in double.

Agathodaemon (75°). Well seen by many observers.

Ambrosia (90°).

Amenthes (250°).

Astaboras (295°).

Baetis (65°).

Bathys (105°).

Cerberus I (210°). In combination with the Trivium Charontis one of the darkest areas on Mars. Well seen by many observers.

Cerberus II (230°).

Casius (265°). Well developed area.

Chrysas (70°).

Chrysorrhoas (75°).

Coprates (85°).

Chaos (210°).

Corax (80°). Seen fainter and narrower in May than in June by Capen.

Djihoun (360°).

Daemon (100°).

Deuteronilus (355°). Well seen by many observers.

Eosphoros (100°).

Erebus (180°).

Eumenides (135°).

Euonostos I (230°).

Eunostos II (245°).

Euphrates (335°). Seen double by Tombaugh on one occasion.

Ganges (65°). Well seen by many observers. Appeared double to Avigliano on two occasions. Double to Saheki on several occasions. At certain angles of foreshortening the double appearance of this canal might be ascribed to a possible view of the two canals, Dodon and Ganges, but on occasions with the Ganges near the C.M. an appearance of the Ganges as a fairly wide parallel double was seen. Also appeared as a parallel double to Cave on one occasion.

Gigas (140°).

Gehon (10°). Seen by a number of observers. Shown double by Capen on three occasions; on one occasion by Tombaugh and on one occasion by Saheki.

Gyndes (225°).

Hades (190°). Well seen.

Hiddekel (345°). Shown by McClelland as a probable double on one occasion.

Hyblaeus (230°).

Hydraotes (35°).

Indus (20°). Well seen.

Jamuna (45°).

Laestrygon (200°).

Nectar (75°). Well seen by many observers.

Nilokeras I (55°). Well seen by many observers. A wider canal converging toward the Lunae Lacus.

Nilokeras II (50°). The area between the Nilokeras I and II was seen as shaded. Saheki showed this wide set of canals as early as December 23, 1953 with the Martian disc at only 4".9 !

Nilosyrtis (280°). Seen by many observers.

Orcus (170°). Seen double by Capen.

Oxus (15°).

Phison (320°). Seen double by Tombaugh on one occasion.

Protonilus (315°). Well seen.

Pyriphlegethon (140°).

Styx (200°). Well seen. Shown as a converging double on two occasions by Cragg.

Tartarus (185°).

Thoth-Nepenthes (260°). Very well seen by many observers. Well developed. Presented a double appearance to Cave on one occasion.

Titan (170°).

Tithonius (90°). Well seen by many observers.

Uranius (85°). Seen with double appearance on one occasion by Avigliano.

All cases of doubtful canal observations have been omitted from the above list.

Probable canals. In this list are the canals that were each well seen by one of the more experienced observers and were more vaguely indicated on independently made drawings of at least two other observers.

Alcyonius (250°).

Araxes (120°).

Callirrhoe (360°).

Cyclops (225°).

Dargamanes (50°).

Dosaron (300°).

Gorgon (140°).

Nar (235°).

Pierius (305°).

Phasis (110°).

Phryxus (50°).

Sirenius (125°).

As some of the observers tend to draw the more difficult canals quite narrow and other observers show them as wider markings only the most general remarks regarding their appearances have been given here. Terrestrial seeing conditions and/or Martian haze or clouds over the canal areas influence greatly the telescopic appearance of canals. A number of observers see canals to be of varying widths at the same observation. A special report on the canals and their varying appearances will appear at a later date. Of the observers with very small apertures, Westfall, with a 4-inch refractor, was able to detect a good number of the more prominent canals.

Oases. These objects, especially the smaller of them, are generally more difficult to observe than are some of the canals. However, a pleasing number of drawings and reports have been received confirming a number of the oases at these earlier dates.

Confirmed oases. The oases listed below were independently seen in accurate positions by at least two (usually more) observers. The longitudes are given as a general aid in identifying these features on a map and thus are only approximate.

Ascraeus Lacus (100°).

Coloe Palus (295°).

Craneum (55°).

Hypelaeus (180°).

Ismenius Lacus (335°). Well seen. Shown with two centers by Tombaugh on one occasion and by Cave on one occasion.

Juventae Fons (65°). Rather dark when well seen. Seen as early as December 22, 1953 by Saheki with the Martian disc at only 4".9.

Lunae Lacus (65°). Seen as prominent by many observers.

Maeisia Silva (80°).

Messeis Fons (85°). Divided into Hebes Lacus and Echus Lacus by Saheki on two occasions.

Morpheos Lacus (225°).

Niliacus Lacus (30°). Well seen by many observers. With two centers as seen by Tombaugh on one occasion and by Capen on one occasion.

Nodus Gordii (140°).

Oxia Palus (15°). Well seen.

Pambotis Lacus (220°).

Phoenicis Lacus (110°).

Propontis I (175°). Reported by Capen as very dark green in color.

Siloe Fons (10°).

Tithonius Lacus (95°).

Trivium Charontis (200°). In combination with the Cerberus I one of the darkest areas on Mars. Well seen by many observers.

The Nodus Alcyonius-Nubis Lacus development (Nodus Laocoontis) was seen as a large area during these earlier dates by many observers, some with instruments as small as 4 inches in aperture (250°). More about this most unusual development will follow in a later report.

Probable oases. These oases were well seen by one of the more experienced observers and were more vaguely indicated on independently made drawings of at least two other observers.

Arsia Silva (115°).

Biblis Fons (125°).

Sithonius Lacus (235°).

Photographs. Lyle T. Johnson has sent in good photographic prints of Mars that he took with his 10-inch reflector on the dates of May 23 and June 13. Some of the images obtained on June 13 show very good detail (C.M. 12°.5 to 14°). Details of materials etc. that he used will appear, most probably, in Report Number 2, which will cover Mars at the dates near opposition.

A.L.P.O. MAP OF MARS IN 1954

A map of Mars showing the individually confirmed features seen by members of the A.L.P.O. is now available. It is a large chart (approx. 10" x 17") that shows nearly 300 named features. The current A.L.P.O. Mars Reports will be based on the nomenclature used in this map; and as the map shows the areas that have recently undergone considerable change, it will be valuable to students for work in 1956. The map can be obtained for $1.00 postpaid from: D.P. Avigliano, 678 W. Manzanita Ave., Sierra Madre, California.

JUPITER IN 1953-54: INTERIM REPORT

by Robert G. Brookes

This is the last Interim Report for the 1953-54 apparition of Jupiter. We plan to publish in the next issue of The Strolling Astronomer all the numerical data that is on hand and to give a summary of the work done by the contributing observers. If any observer has material on hand that he has not already sent to the Jupiter Recorder, he is urged to do so at his early convenience.

Observers

During the period March 1, 1954 to May 28, 1954 reports were received from the following observers:

Name	Telescope	Station
Leonard B. Abbey, Jr.	6-inch refl.	Decatur, Georgia
R. M. Adams	4 1/3-inch refr. 10-inch refl.	Neosho, Missouri
Howard G. Allen	6-inch refl.	Coatesville, Pa.
D.P. Avigliano	6-inch, 8-inch and 12.5-inch. refls.	Sierra Madre, California
Richard M. Baum	9-inch refl.	Boughton, Chester, England
Phillip W. Budine	3.5-inch refl.	Walton, N.Y.
Helene Calamaras	6-inch refl.	Woodside, N.Y.
Charles Cuevas	6-inch refl.	Long Island City, N.Y.
Charles M. Cyrus	10-inch refl.	Baltimore, Md.
Eugene Epstein	10-inch refl.	Hollywood, California
Edwin J. Gilmore, Jr.,	6-inch refl.	Allentown, Pa.
Lyle T. Johnson	10-inch refl.	La Plata, Md.
Alan P. Lenham	3½-inch refr. 6-inch & 9-inch refls.	Swindon, Wilts.,England
Eugene A. Lizotte	6-inch refl.	Long Island City, N.Y.
Toshihiko Osawa	6-inch refl.	Osaka, Japan
Edgar M. Paulton	6-inch refl.	New York, N.Y.
Owen C. Ranck	4-inch refr.	Milton, Pa.
E.P. Wallner, Jr.,	6-inch refl.	Bethpage, N.Y.
John E. Westfall	4-inch refr.	Oakland, California

Brief Description

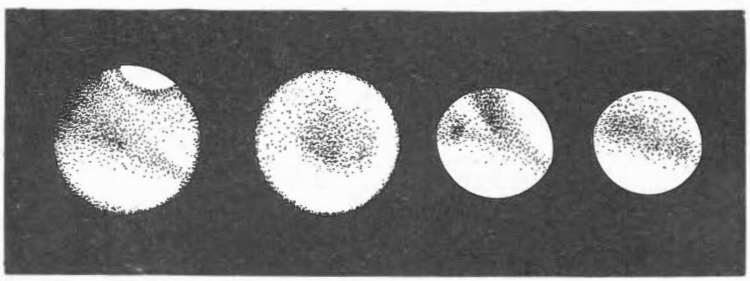
The Planet. Jupiter displayed very little change during the period covered by this report. The colors, conspicuousnesses and intensities of the belts and zones have showed no marked change since the last report was written.[1]

Owen C. Ranck saw the E.B. as late as April 13, 1954; also, he has shown the N.E.B. as being triple on a number of occasions. D.P. Avigliano has made periodical color checks with a set of matched color filters. He writes "... during 1954 (to March 20) the colors of the main belts of Jupiter were generally found to be an orange-red with possible traces of red-purple. The N.E.B. was generally darker toned than the S.E.B. These filter observations, thus, compare well with those made without filters." Mr. Avigliano usually used a 12.5-inch reflecting telescope in his filter studies. The Red Spot area still has the aspect of the Hollow. The R.S.H. is not very conspicuous and only three or four observers have recorded it with any regularity. Alan P. Lenham writes that observers in England have been unable to see any sign of the R.S.H. this apparition.

The Satellites. We propose to give here a report of the general appearance of the Galilean Satellites during the past apparition based on a very limited number of observations. There are at hand drawings received from: Richard M. Baum, Thomas A. Cragg, Alan P. Lenham and Owen C. Ranck. D. P. Avigliano, also, made a number of Satellite observations which he reported in his recent paper.[2] On August 30, 1953, 10:40 U.T. Mr. Cragg observed JIII (Ganymede) (Figure 10). He notes that the drawing is very similar to other

Figure 10. Jupiter III.
Thomas A. Cragg.
August 30, 1953. 10 hrs., 40 mins., U.T.
12-inch reflector. 168X, 336X.
Seeing poor to fair. Thin to very heavy fog.

drawings made in recent years. This drawing shows both polar caps and a dark equatorial belt. Again on October 20, 1953, using the 60-inch Mt. Wilson reflector, Mr. Cragg observed JIII and saw the polar caps and the equatorial belt; no finer detail was recorded. He remarks, "... a line parallel to the apparent equator of JIII is inclined to the equator of Jupiter by something near 15°." On November 4, 1953, 21:10 U.T., Lenham observed JIII. This observation showed a bright southern polar region and a fairly bright northern polar region and limb. There was a dark triangular-shaped central marking on the disc; the base of the triangle was on the south side. On January 4, 1954, 22:40 to 22:50 U.T., Mr. Baum made drawings of all four of Jupiter's primary satellites (Figure 11).



III IV I II

Figure 11. The Four Large Moons of Jupiter.
R. M. Baum.
January 4, 1954. 22 hrs., 45 mins., U.T.
9-inch reflector. 240X.
Seeing rather poor.

He recorded JIII as having a very bright southern polar cap and what appeared to be an equatorial belt. He recorded the color of JIII as being a golden-yellow. JIV (Callisto) displayed a central dark spot of a diffuse nature possibly extended toward the southeast side of the disc. The markings seen on JI (Io) and JII (Europa) were not nearly so sharply defined as those seen

on the other two satellites. It might be noted that JI and JII were elliptical in shape. On January 24, 1954, 17:20 U.T., Alan P. Lenham made a drawing of JIII (Figure 12). This drawing shows the darker equatorial marking with an extension to the northwest and the southern polar cap was bright.

Figure 12. Jupiter III.
Alan P. Lenham.
January 24, 1954. 17 hrs., 20 mins., U.T.
9-inch reflector. 265X.

From March 11 to April 14, 1954 Owen C. Ranck made six drawings of JIII and four drawings of JIV. On every drawing he showed JIII as having a bright equatorial region and shaded polar regions; also, he showed a dark spot on five of the JIII drawings that corresponds very closely to feature 4 on Mr. Avigliano's map.[3] He showed JIV as having a shaded limb and bright interior on all his drawings of that satellite. Figure 13 shows the two satellites as Mr. Ranck usually saw them.

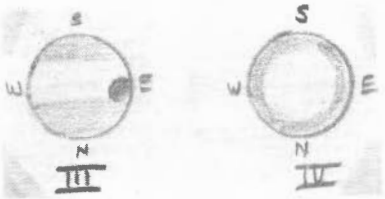


Figure 13. Jupiter III and
Jupiter IV.
Owen C. Ranck.
March 19, 1954. 0 hrs., 2 mins., U.T.
4-inch refractor. 240X.
Seeing good. Sky clear.

Observations and Comments

An excellent series of photographs has been received from Mr. Lyle T. Johnson. During ten nights of observing, from August 1953 to February 1954, Mr. Johnson secured 13 sets of photographs consisting of 80 separate images of the Giant Planet. Fine detail was visible on a number of these photographs. From these photographs we have been able to secure measurements of the latitudes of some of Jupiter's belts. These measurements will be published at a later date. Mr. Johnson uses a 10-inch modified Gregorian reflecting telescope with a focal length of 180 inches. Some of his photographs were made at the f: 18 focus and some were made using a Gramatzki Barlow lens which gives an equivalent focal length of about 500 to 530 inches. He used Microfile, Plus X and Super Tomic film exposed for periods of from $\frac{1}{4}$ (?) to 2 seconds.

The Naked Eye Visibility of the Satellites. A discussion of the naked eye visibility of Jupiter's four primary satellites occurred at the February 24, 1954 meeting of the British Astronomical Association.[4] We will give here a summary of that discussion. Mr. P. M. Ryves brought the subject up, while giving his monthly report on forthcoming astronomical events, when he stated: "There is a lady, Mrs. Janet Hitchman, who can see the four satellites with the naked eye." Mr. H. Wildey qualified the above statement: according to the account in his morning paper, the lady only saw two of the satellites. "The other six were invisible as they were at that time behind the planet !" This statement was greeted with laughter. Mr. P. A. Moore remarked that of the two newspapers he saw, one reported the lady as seeing four satellites while the other reported she only saw two of the satellites. The lady's reliability as an observer might be questioned; however, there is the possibility that she saw the satellites as one when two or more were favorably grouped on one side of Jupiter-Recorder.) The discussion continued with the following remarks: Mr. H. Thomson reported that in a recent letter

in the Daily Herald, Mr. W. C. Fenwick, F.R.A.S., wrote that he could occasionally see two of Jupiter's satellites (as one?) with the naked eye. Mrs. V. Reade said that her grandfather told her father that he had seen the satellites with his naked eye by occulting Jupiter behind a "chimney pot". Dr. W. H. Steavenson remarked that he believed it was on record that some practiced observers had seen two of the satellites as one object when they were close together. Mr. G. F. Kellaway reported seeing all four of the primary satellites with his naked eye; however, they only appeared as a dim "star" to the naked eye but upon examining "the star" with binoculars its true nature was revealed, a loose grouping of the four primary satellites. Mr. Ryves quoted a case by Chambers (see below) where someone reported a "small star" near Jupiter; and when a telescope was directed toward Jupiter, the "small star" was resolved into the four primary satellites grouped together. Mr. E. H. Noon quoted the case of an African who had wonderful eyesight. "He went to his settler employer and said: 'Master, you see that brilliant star; he swallowed two little stars, but it is all right - he just spat them up again'".

Recently Mr. Leonard B. Abbey, Jr. sent some material from an old astronomy book by Chambers[5] that dealt with the naked eye visibility of the primary satellites of Jupiter. One case that Chambers reported is probably the same as Mr. Ryves quoted above. The observer was Mr. C. Mason, the time April 15, 1863. Mr. Mason made a systematic attempt to determine whether the satellites are visible to the naked eye. On the above date after a close watch on Jupiter he saw what appeared to be a "little star" close to Jupiter, and upon directing his telescope on Jupiter he found the "little star" to be all four of the satellites grouped on the same side of the planet. Chambers also reported in the same book: "Wrangel, the celebrated Russian traveller, states that when in Siberia he once met a hunter who said, pointing to Jupiter, 'I have just seen that larger star swallow a small one, and vomit it shortly afterwards' (an occultation of III)."

Perhaps some of our readers would be interested in trying their eye on naked eye observations of the four primary Jovian satellites. Their best chance of seeing them will be when Jupiter is well up in the sky on moonless nights when the seeing and transparency are excellent. The observer should make his observation without knowledge of the satellites' configuration, so do not consult the Ephemeris until after the observation has been made. If anything is seen that resembles a dim star close to Jupiter, check it with a telescope or binoculars to determine its true nature. If at all possible, have someone confirm your observation.

We will be interested in receiving reports of all such observations, either positive or negative.

Transit Observations

Transit observations were sadly neglected during this apparition. All together we have less than 500 transits recorded for the 1953-54 Jovian apparition, where 2000 is regarded by the authorities as being the minimum number of transits necessary to get a complete picture of the rotation of the various currents in Jupiter's atmosphere.

Transit observations are probably the most important Jovian observation open to the amateur observer; they are absolutely essential in the computation of rotation periods. By making such observations and sending them to the Jupiter Recorder, so that they can be tabulated, the observer will be contributing directly to the store of knowledge that is being accumulated about the Giant Planet's atmosphere.

Transit observations are very easily made. They consist of recording to the nearest minute the time when a spot or marking is on Jupiter's central meridian. The watch or clock used shouldn't gain or lose more than one minute during the period of the observation. A good idea for those who have a short wave radio is to set their watch by WWV time signals before each observing period. WWV time signals are broadcast continuously over wave lengths of 2.5, 5, and 15 megacycles. The description and location of the marking should also

be given. The longitude of the spot or marking can be determined by the precepts set forth in the article, "For the Beginner: The Computing of Central Meridian", published in the July 1953 issue of The Strolling Astronomer. If the observer is unable to reduce his observations to longitudes, he should send the times of his transits to the Recorder, who will then do the reduction. However, the observer is urged, when at all possible, to reduce his own observations.

Please include transit observations in your observing program for the current 1954-55 Jovian apparition.

References

1. The Strolling Astronomer, Vol. 8, Nos. 1 & 2, 1954, pp. 6-9.

2. Ibid, pp. 11-15.

3. Ibid, figure 7, pg. 12.

4. Journal of the British Astronomical Association, Vol. 64, No. 5, 1954, pp. 189-191.

5. Descriptive Astronomy, George F. Chambers, F.R.A.S., Clarendon Press, Oxford, 1867, pp. 109-110.

OBSERVATIONS AND COMMENTS

Linné. The small and difficult craterlet inside the white area has recently been observed well by D. P. Avigliano (Figure 14) and Thomas Cragg. Mr. Avigliano says of his observation: "The craterlet was seen easily and for

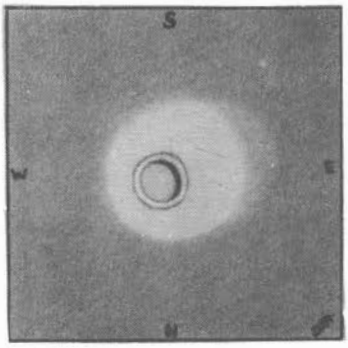


Figure 14. Linné.
D.P. Avigliano.
12-inch Zeiss refractor,
300X. (Griffith Observatory).
Wratten No. 15 (yellow)
Filter employed.
August 17, 1954. 6 hrs., 30 mins
Colong. 129°.0.

seconds at a time. It held a thin black crescent shadow. This is the earliest evening illumination that I have ever seen the craterlet shadowed. The appearance of the craterlet was similar to other larger craters in the general area; at this lighting it appeared as a miniature rimmed and floored crater. The general appearance and position of the craterlet, its size and the shadow it held were confirmed with certainty by Thomas A. Cragg who was also observing. The position of the craterlet at this observation was definitely to the N.W. of the center of the white spot, more to the W. than to the N. The craterlet's rim was bright. The Wratten No. 15 (yellow) filter improved the clarity of the finer details." We remark in passing that many lunar observers find a yellow filter or a neutral-tinted filter very helpful because it reduces the glare of the moon. Mr. Cragg's observation was with a 12-inch reflector at 420X on September 5, 1954

at 3 hrs., 15 mins., U.T., the colongitude being 359°.6. Thus only a day from the sunrise terminator, the Linné crater was almost full of shadow and had a diameter more than half that of the surrounding diffuse white area. Cragg remarked that the crater had a very obvious lip-like rim and a deep, concave bottom.

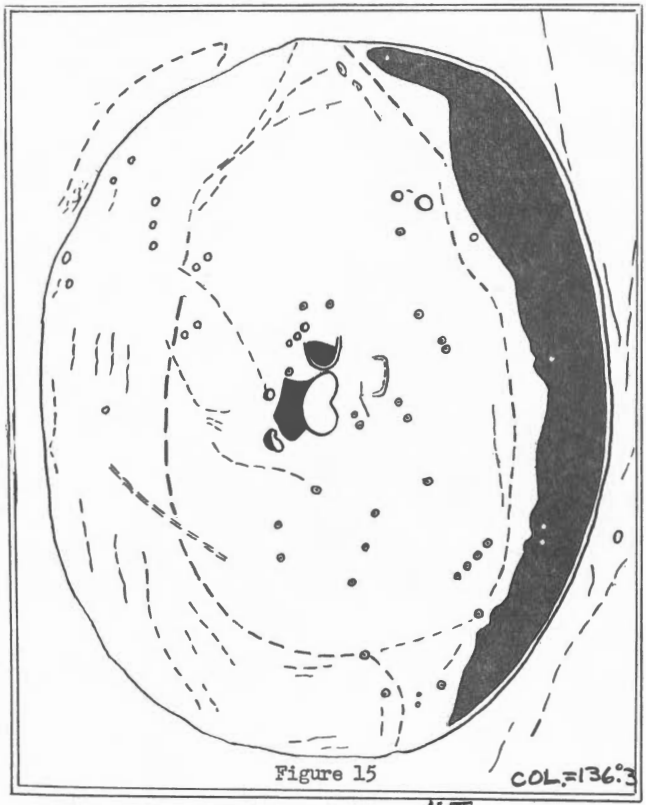


Figure 15

Piccolomini. 1953 Set. 26, 23h40m U.T. 25-in. O.G. × 400.
(Cambridge Observatory.) Patrick Moore, F.R.A.S.

Piccolomini and Large Telescopes. Figure 15 shows the appearance of the walled plain Piccolomini to an experienced lunar observer employing a large telescope. During the last few years Dr. H.P. Wilkins and Mr. Patrick Moore have had occasional access to the Meudon Observatory 33-inch refractor and to the Cambridge Observatory 25-inch refractor and 30-inch reflector. They have been more than pleased with the lunar scenes revealed by these giant telescopes; they have in fact discovered hundreds of previously unmapped craterlets, hills, clefts, etc. quite beyond the grasp of ordinary-sized telescopes. They emphasize that these large telescopes performed so superbly even when conditions were only moderately favorable. A number of the drawings made by Wilkins and Moore with the Meudon 33-inch appear in Dr. Wilkins' Our Moon, which was reviewed in the March-April 1954 issue of this periodical. Would it not be most excellent if at least one American observatory could occasionally grant a few hours of a large telescope's time to advanced amateurs for lunar and planetary work? We realize, of course, that professional astronomers work on an exacting schedule and must use every hour of clear sky to best advantage. But might not a rare exception be made?

Figure 15 shows Piccolomini under late afternoon lighting with shadow advancing down the east inner wall. Its appearance here may be compared to its aspect on Section IX of the Wilkins map. Mr. Moore's drawing is somewhat stylized; the ovals are hillocks, and the ovals with dots in the center are crater-cones.

The fortunate possessors of large telescopes will surely enjoy trying to confirm the features shown. We might note that this drawing shows nothing of a dark streak or cleft on the floor of Piccolomini, a feature which received some attention in the press in 1954 as a supposedly new lunar object.

Mersenius. To those persons who may not be able to use a 25-inch telescope for their lunar looking, we suggest that Figure 16 should be both an inspiration and an example. Mersenius is a walled plain on the east shore of the Mare Humorum and may be found on Section XX of the Wilkins map. The detail seen by Mr. Reese with only a 6-inch telescope is a great tribute to the excellence of his optics and to the skill which he has acquired through long years of active observing. Mr. Reese says of this drawing: "On the floor were seen six craterlets, five hills, a curving whitish streak to the south, and a thread-like white streak west of center. The thread-like streak may be a cleft, however no shadow was seen except for a small isolated patch on the southeast side of the white streak. The east edge of the floor appeared very dark - almost black in two places". The "thread-like streak" may be identical with a cleft shown in approximately the same position on the Wilkins map. The extreme darkness of the east edge of the floor under morning lighting suggests that the floor of Mersenius is convex, a similar aspect being visible in many other lunar craters.

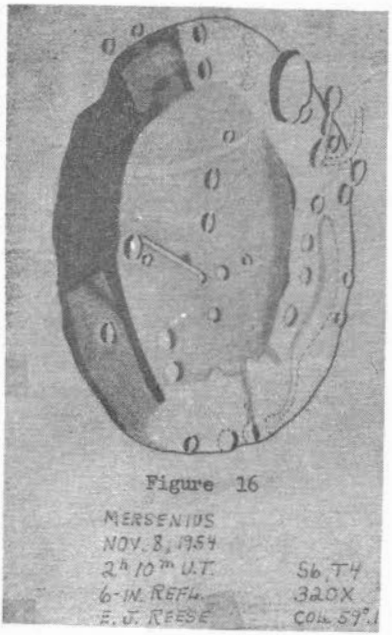


Figure 16

An Occultation of a Star by Vesta. Mr. Chalmers Myers of Terminal Island, Calif. has reported an observation with his 10-inch reflector of the occultation of the star B.D.+19° 945, of stellar magnitude 9.1, by the asteroid Vesta on December 22, 1954. The observers were Charles W. Dayton, John G. Dayton, Jr., John G. Dayton, Sr., Frank Daley and Chalmers Myers. At the request of Mr. Thomas Cragg, they attempted to determine how long the star was hidden by the asteroid. First contact of the asteroid with the star was observed to occur at 5 hrs., 57 mins., 30 secs., U.T.; Vesta "broke away" from the star at 6 hrs., 0 mins., 40 secs., U.T. Imperfect seeing and dew forming on the flat hampered the observation. Noting that Vesta of approximate stellar magnitude 7.1 on December 22 was two magnitudes brighter than the star, the Editor would think that accurate times would have been difficult to estimate. If others observed this occultation, it will be interesting to compare their times with those of Mr. Myers and his associates.

Birt, Plato, and Cavelerius. These lunar objects have been observed by one of our newer members, Mr. Jack Eastman of Manhattan Beach, Calif. His telescope is a 6-inch reflector, usually employed at 140X or 210X. On the east inner wall of Birt Mr. Eastman has seen three dusky wall bands, hence one more than Mr. Moore mentions in his Guide to the Moon. Birt is readily identified as a deep crater 11 miles in diameter and just east of the famous Straight Wall. On December 9, 1954 at colongitude 77°.4 Mr. Eastman suspected two dark bands on the southeast inner wall of Cavelerius, a ring-plain just north of the giant plain Hevel on Section XIX of the Wilkins map. These lunar wall bands must indeed be rather numerous. A view of Plato under poor conditions on December 9, 1954 showed nothing unexpected. This observer has found yellow and green filters

helpful for reducing glare in his studies of the moon.

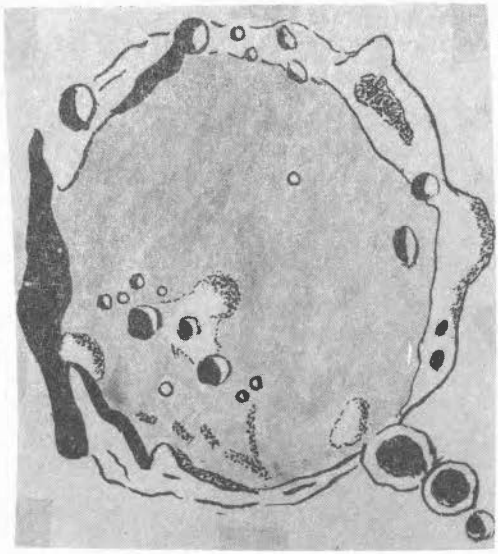


Figure 17. Walter.
Frank J. Kelly.
June 10, 1954. 1 hr., 30 mins., U.T.
4-inch refractor. 150X.
Seeing fairly good. Sky clear.
Colongitude 15°.6.

Walter. There are, alas, lunarians who lack both 25-inch refractors and Mr. Reese's talent for observing and drawing. Therefore, we should like to present here as Figure 17 a drawing by Mr. Frank J. Kelly, a comparatively new lunar observer, with a 4-inch telescope. Walter is a giant walled enclosure on Section VIII of the Wilkins map. Mr. Kelly writes: "It was my impression that the trio of large craters were part of a triangular shaped hill which was at its highest point at the corner which faced the center of the ringed plain". Our readers might check on this impression; it will be best to study Walter both under morning lighting (soon after First Quarter) and under evening lighting (soon before Last Quarter). Mr. Kelly's triangular hill is shown rather well on Section VIII of Goodacre's map of the moon.

Aristarchus, Herodotus, and Schroeter's Valley. Mr. Frank Suler of Richmond, Texas drew Herodotus and Schroeter's Valley on July 13, 1954 at colongitude 60°.2 and drew Aristarchus and Herodotus on September 11, 1954 at 72°.8. He employed a 5-inch reflector at 210X. Neither view showed him the slightest sign of Dr. Bartlett's pseudo-peak in the center of Herodotus (refer to our July-August, 1954 issue). Detail in Aristarchus on September 11 included two dark bands on the east inner wall, a third band on the north inner wall, the central peak, a crater on the southeast rim, and a dusky border at the north edge of the floor. Mr. Suler draws the three dark bands mentioned to widen from the foot of the inner wall to the rim of Aristarchus.

Hercules D. Such is the name of the largest crater on the floor of the ringplain Hercules. We mentioned on page 43 of the March-April, 1954 Strolling Astronomer that O.C. Ranck once drew two white spots, perhaps peaks, within Hercules D. Attempting to confirm these markings, Howard G. Allen drew D on July 17, 1954 at colongitude 110°.2 and on July 18, 1954 at 122°.4. He employed a 6-inch Cave reflector at 300X. Sunset shadow filled about one-fourth of Hercules D on July 18. Mr. Allen was unable to confirm Mr. Ranck's two white spots. He did distinguish a brighter area near the west edge, and another near the south edge, of the rather gray crater; their topographical nature is uncertain. Peaks should have shown up well under the oblique solar lighting, but it will be worthwhile to keep on looking. In a drawing of Hercules on June 7, 1954 at 338°.8 with a 4-inch Tinsley refractor Ranck shows D more than half full of shadow and without interior detail. He also shows a diffuse white area near the center of Hercules, a feature absent from his previous drawings of it.