Volume 6, Number 2 February 1, 1952

ASSOCIATION OF LUNAR AND PLANETARY OBSERVERS

The Strolling Astronomer

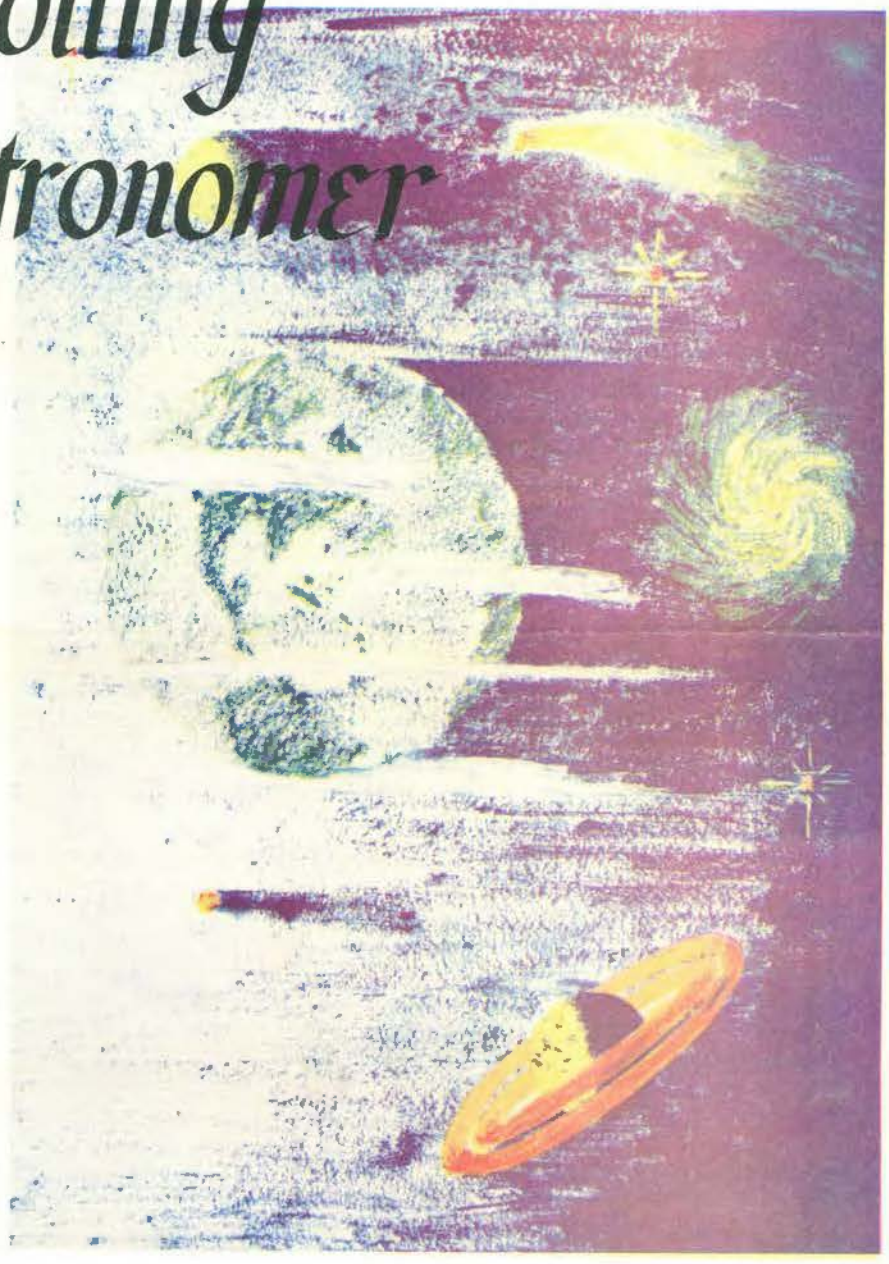

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FIG.1

Venus -2/11/51 -23h 23m UT

S-5; T-5 100x on 3.5 in.refl.

James C Bartlett,Jr

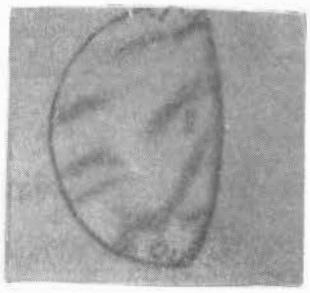


FIG.2

Venus -5/2/51 - 0h 38m UT

S-5; T-3 300x on 10" refl.

L.T. Johnson

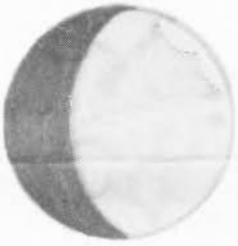


FIG.3

Venus -5/3/51 -8:59 P.M.

(Osaka local time ?)

T. Osawa

FIG 4

Venus

after P. Lowell

STB

SEBs

SEBn

FIGURE 4A
JUPITER'S RED SPOT
July 26, 1951
4h 8m UT
S5, T3
6-in. refl., 240X
E.J. REESE

Numbering of Pages in January, 1952, Issue. Readers are requested to insert the number "15" at the bottom of the back inside cover of the January issue. On this page appeared Section XVI of the Wilkins map. It is planned to number the pages with the Wilkins map sections in each issue in the future for convenience of reference.

Numbering of Wilkins Map Sections. Several readers have noticed that Section XIV of the Wilkins map in the November, 1951, issue followed Section XII in the October, 1951, issue. They have asked about the missing Section XIII. This section is a small corner section and was published along with three other corner sections in our October, 1950, issue. The others are Sections XVII, XXI, and XXV.

Acknowledgement. We express our thanks to all members who contributed material for the A.L.P.O. display at the Astronomical Exhibition in Spain, to be held in March by the Agrupación Astronómica. We were very gratified to be able to send them an excellent sample of recent and current A.L.P.O. studies.

Illustrations in Current Issue. On pages 16, 20 and 22 readers will find a total of 8 drawings of Jupiter, or a portion thereof, and 6 drawings of Venus. These can and should be carefully studied in connection with the Reports on Jupiter and Venus in this issue by Section Recorders Both and Bartlett respectively.

New Envelopes. Beginning with this issue, The Strolling Astronomer is being mailed in envelopes 6.5 inches by 9.5 inches rather than in business envelopes, as before. It is now necessary to crease each copy only once instead of twice. We hope that your copy will now reach you in better condition and will look more attractive in your files.

This change will not affect readers who made special arrangements to receive their copies unfolded in envelopes 9 inches by 12 inches while the Wilkins map of the moon is being serially reproduced.

THE MARKINGS OF VENUS - SOME A.L.P.O. STUDIES

by James C. Bartlett, Jr.

That Venus occasionally exhibits more or less well-defined markings has long been the subject of doubt and debate. Positions have varied from those of the 17th century enthusiasts who fixed the rotation and constructed maps of Venusian oceans, to that of Herschel who was never able to see any permanent markings whatsoever. Referring to the labors of the early cartographers, Newcomb rather neatly summed up the modern position when he wrote: "The best-informed astronomers of the present day look with suspicion on nearly all these observations....."[1]

A careful review of the literature plus observational material, however, does suggest that from time to time Venus exhibits rather well-defined markings of a permanent nature. The important clause is - "From time to time". In this connection it is suggestive that the 17th century astronomers, some notables among them, were quite convinced of the existence of the markings; whereas in the astronomical Middle Ages there was much less certainty and much more skepticism; and in our day skepticism is the dominant note.

The historical progress from complete credulity to complete incredulity might be thought to relate to progressive instrumental improvement, a suggestion made by Newcomb; but there is an alternative explanation which is strongly supported by A.L.P.O. studies and by other work, namely that the mean level of cloudiness of the Venusian atmosphere may be subject to cyclical variation.

The observations of A.L.P.O. members scarcely leave any doubt of short-term variations; and the probability of longer ones, of the order of centuries and millenia, should not be thought surprising. The work of Douglass with tree-ring records has shown conclusively that the mean transparency of the earth's atmosphere has fluctuated markedly, at least for given areas in given eras of time. This is shown by the relative abundance of rain (and consequently of cloud) and sunshine (which implies clear skies) as revealed by the relative thickness of the annual growth rings. Arid periods must certainly have been characterized by scanty cloud and prolonged sunshine. Humid and glacial periods must have had the reverse. Such alternations may be traced far back in geologic time, and a glacial period is even known in the Pre-Cambrian.[2] It would seem very probable that Venus, so similar to the earth in mass, specific gravity, diameter, and in the possession of a dense atmosphere, may have experienced similar fluctuations. One thing is certain. Any alternations between humidity and aridity which depended upon solar cycles (demonstrated by Douglass by correlation of sunspot periods with tree-ring variations) would necessarily affect Venus; though for several reasons - unknown length of the Venusian day - shortness of the Venusian year - unknown inclination of the Venusian axis of rotation - composition of the Venusian atmosphere, etc., the assumed Venusian cycles would probably not correlate well with terrestrial cycles arising from the same cause. In passing it may be mentioned that the writer does not regard Wildt's theory of "plastic" clouds on Venus very seriously.[3] In practice this means that Venus might be going through a cycle of profound cloudiness coincidentally with an opposite terrestrial cycle, or vice versa. At any rate it is suggested that the earliest observers may have begun their work in a closing period of relative transparency of the Venusian atmosphere. This would explain as well as the instrumental improvement theory why their successors had such poor results with the planet. Perhaps it will explain even better for the "poor" telescopes of the pioneers were nevertheless good enough to reveal the primary division in Saturn's rings to Cassini and the Syrtis Major to Hooke. Certainly, therefore, they should have been capable of showing any markings which might have existed on Venus.

With this brief and incomplete introduction to the subject we may pass to characteristics of the markings as determined by A.L.P.O. observations during the 1951 apparition.

With very few exceptions a characteristic general for all the observations is the relative nebulosity of the markings. They are not only often faint but are almost always diffuse, vague, shadowy spots which fade off imperceptibly, or grayish streaks, perhaps a little more sharply defined, but still relatively inconspicuous. Exceptions are provided by the bright spots, probably local clouds, which are rather clearly delimited. The dark markings may be divided into two classes: Large, diffuse spots tending to oval or rounded shapes like lunar <u>maria</u> or terrestrial oceans, and systems of more or less straight streaks generally better defined. The two classes may also be present at the same time and show some degree of association.

<u>The Large, Dusky Spots</u>.

It is a noteworthy, though unexplained, fact that almost without exception the various observers reported very few examples of this class during the 1951

apparition. It is true, according to Cave,[4] that O. C. Ranck observed several such spots "particularly near dichotomy"; but it may be pointed out that at this phase the terminator shading is often very deceptive. On the whole, as also noted by Cave, the observers agree in reporting belt-like markings or systems of streaks as the dominant type. However, in the course of 55 observations of Venus, from February 8th to August 6th, the writer recorded diffuse, dusky spots on seven dates, streaks on nine dates, and mixtures of both on three dates. The remaining thirty-six observations were negative, showing either a vague shadowing too indefinite to be drawn or a complete absence of markings.

What is more remarkable is the fact that after inferior conjunction, as indicated by the numerous observations of O. C. Ranck, Lee Bellot, and Phil Cluff, large, dusky spots appear to have been more easily seen, though much belt and streak detail is also shown. It is the opinion of the Recorder, that these observations are affected by the unsteady air of winter mornings. Estimates of 2, 3, and 4 for the seeing are common to all three observers, though Ranck seems to have had somewhat the better of it and several times recorded the seeing as 6 and 7 (on a scale of 0 to 10, with 10 best).

The Belts and Streaks

Contrary to what might be anticipated, as Venus passed from superior conjunction to dichotomy the streak markings became prominent in the records of the observers quite early. The first markings observed by the writer in February (Fig. 1) were some vague streaks observed in the center of the gibbous disc; and as early as March 27th, M.B.B. Heath was recording belt-like detail, which he also saw March 30th, April 4th, April 14th, and May 14th. He remarks (in a letter to W. H. Haas) "....throughout March, April, and May I have drawn such many times...." L. T. Johnson on May 2nd, 1951, at $0^h\ 35^m$, U.T., found many streaks on the gibbous disc; and his drawing (Fig. 2) gives an excellent idea of the general appearance of this class of marking. T. Osawa, Osaka, Japan, has submitted eight beautiful drawings of Venus from April 21st to May 10th in which streak-like markings are associated with dusky areas. However, his seeing was uniformly poor with one exception, May 3rd, when it was very good (Fig. 3).

R. M. Baum has recently made observations of streak-systems which appear to resemble those first reported by Lowell. His drawings are not yet at hand as this Report goes to press; but it would appear from his communications that they will closely resemble the drawings of Lowell. In Fig. 4 is given a copy of one of Lowell's curious drawings, which may be compared to Figs. 1 and 2.

The writer has never seen anything on Venus resembling the "spoke system" of Lowell; yet whatever value is to be placed on Lowell's specific drawings, the occurrence of well-marked streaks on the disc of Venus can scarcely be doubted. Nor is the interpretation of them as difficult as might at first appear. That they represent actual surface features need not be inferred and in any case is very doubtful, though it may well be that they are determined by real, underlying surface features. A system of parallel valleys, for instance, might give rise to atmospheric currents which, by locally dispelling the general cloud cover, would partially unveil the underlying surface in a series of streaks or bands. Short streaks might thus arise, though for those which cross the disc from limb to terminator such an explanation is inadequate.

However, it is clear that if the atmospheric circulation of Venus is in any way similar to the earth's, then a streaked appearance of the surface might almost be predicted. This derives from the fact that belts of alternating high and

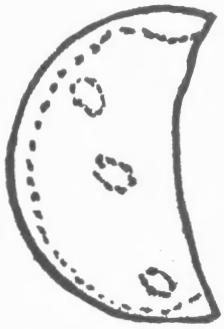


FIG. 5

Venus -7/4/51 -0h 55m UT

S-4; T-3 100x on 3.5 in.refl.

James C Bartlett,Jr

FIG. 6

Venus -6/22/51 -3h 05m UT

S-5; T-3.5 to 4. 125x on

12" refr. Thomas Cragg

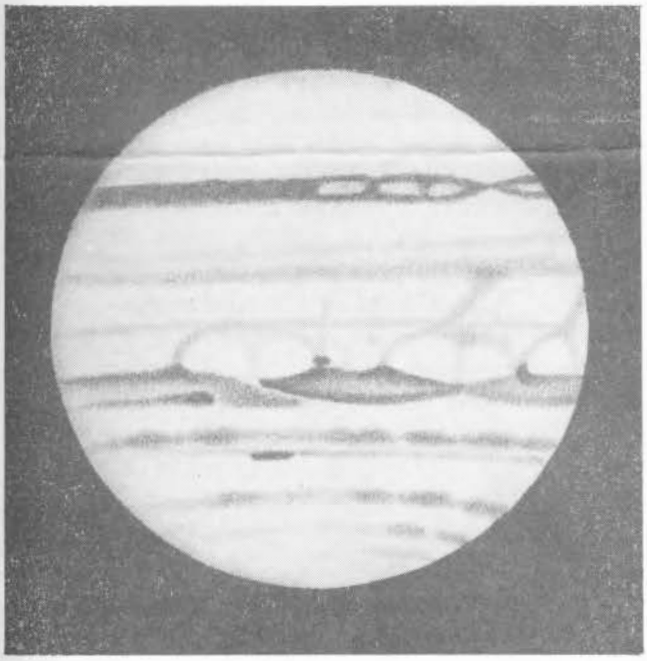


Figure 7. Jupiter
T. Saheki. 8-inch refl.
222X, 330X.
Aug. 10, 1951. 18^h42^m, U.T.
C.M.1 = 134°. C.M.$_2$ = 336°.

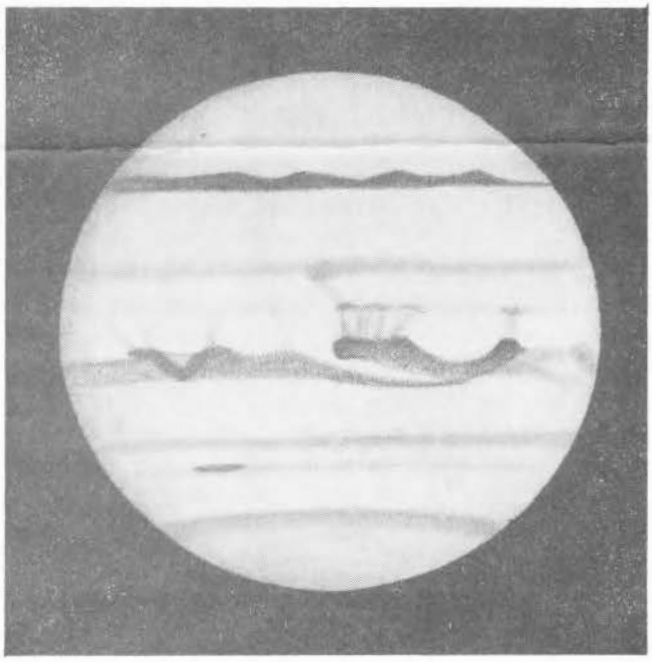


Figure 8. Jupiter
T. Saheki. 8-inch refl.
222X, 330X.
Aug. 30, 1951. 20^h0^m, U.T.
C.M.1 = 101°. C.M.$_2$= 151°.

low pressure might be expected. The "highs" would correspond to belts of relatively transparent air, and the "lows", to belts of cloudy air. The general effect, seen from outside, would be a system of more or less parallel, dusky streaks. It is perhaps not generally recognized that, as seen from Mars, the earth must frequently show streak-like markings.

Lowell's "spoke system" has generally been discredited, though the writer believes that it had some basis in fact. It may be noticed that the salient feature of the Lowellian system was the radiating of the streaks from a central point (or nearly central point) on the disc, like spokes from a hub. This appears to be the result of R. M. Baum's recent work also. An approach at least to such a formation is evident in one of Osawa's fine drawings; though as his seeing was "poor to very bad", its value is diminished. However, it may be noticed that if the streaks shown in Fig. 1 were prolonged they would meet at a common point near the center of the disc. It is very difficult to find a convincing intrepretation of such an arrangement, though because we may not understand a thing is not to say that it is impossible. But whatever degree of reality may attach to radiating systems per se, the writer feels that the existence of linear markings on Venus is well established.

It has been suggested above that the streaks are determined by atmospheric circulation and by local currents arising as a consequence of topographical modifications. In regard to the former, it is rather significant that the streaks commonly show a marked inclination to the terminator, well depicted in L. T. Johnson's drawing and less perfectly in Bartlett's. Such inclination, however, is a common feature of this class of markings and rightly considered may offer analytical tools of considerable value.

The writer proposes that in this observed inclination we have a valuable clue to the nature of the rotation of Venus, though not, alas, to its value. If the streaks arise through atmospheric circulation, then it is clear that the Venusian atmospheric currents have a marked spiral component, which further suggests that the poles of rotation are in or very near to the cusp caps. Assuming this to be so, the northern hemisphere currents indicated in Johnson's drawing would have a deviation to the N.E. as they leave the equator. Now this would correspond to those high altitude terrestrial winds known as the S. W. Antitrades, which show a marked deviation to the N. E. as they leave the terrestrial equator. This deviation is caused by the rotation of the earth. If the Venusian streaks are indeed phenomena of the general circulation of the Venusian atmosphere, then the eastward deviation of the winds producing them is presumptive evidence of a comparatively rapid rotation.

Mention may here be made of the famous Ross photographs taken at Mt. Wilson, which show well marked cloud belts on Venus.[5] Comparison of these pictures to drawings of the streaks herein considered reveals a significant difference. Though some of the Ross photographs show an inclination of the belts similar to the inclincations given in the A.L.P.O. drawings, on the whole the Ross belts tend to lie more nearly east and west. Now this apparent contradiction is easily explained when we remember that the Ross photos were taken by ultraviolet light, which has little atmospheric penetrating power. The Ross pictures then are pictures of cloud strata in the upper levels of the Venusian atmosphere. The winds of the upper atmosphere of the earth are steady westerlies in the northern hemisphere. Hence again we have a strong indication that the circulation of the Venusian atmosphere is similar to the circulation of the terrestrial. It is also significant that the visibility of the highly inclined streaks is favored by the use of a red filter, which presumably enables us to penetrate to lower

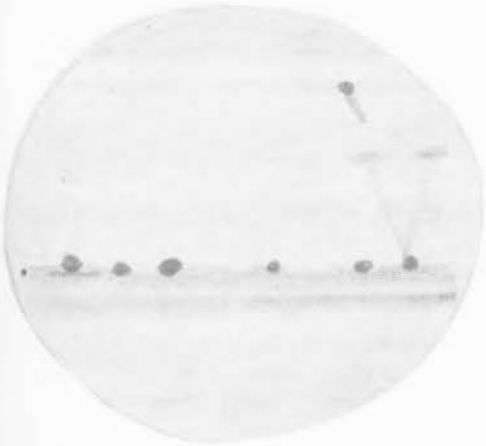


Fig. 9. Jupiter. J.C. Bartlett, Jr.
3.5-inch refl. 100X.
Sept. 1, 1951. 6^h59^m, U.T.
$C.M._1 = 298°$. $C.M._2 = 336°$.

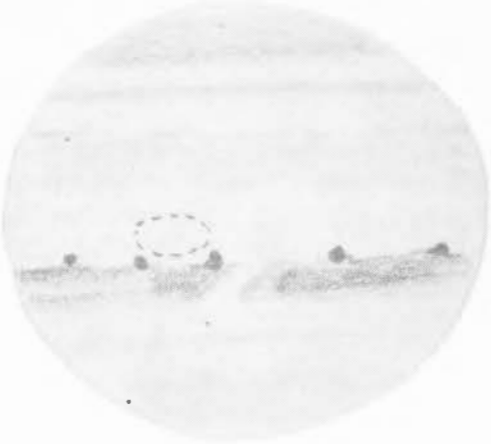


Fig. 10. Jupiter. J.C. Bartlett, Jr.
3.5-inch refl. 100X.
Sept. 4, 1951. $4^h\,14^m$, U.T.
$C.M._1 = 313°$. $C.M._2 = 323°$.
(Dotted oval in E. Z. is bright spot described in text).

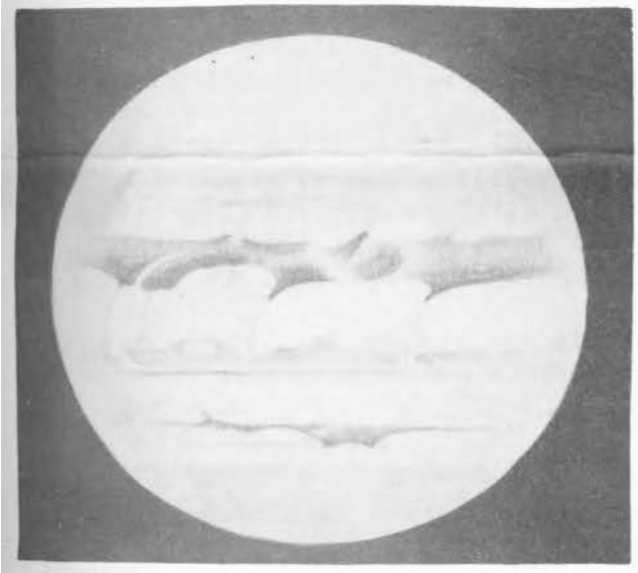


Fig. 11. Jupiter. T. Osawa
6-inch refl. 230X.
Aug. 11, 1951. $18^h\,20^m$, U.T.
$C.M._1 = 278°$. $C.M._2 = 113°$.

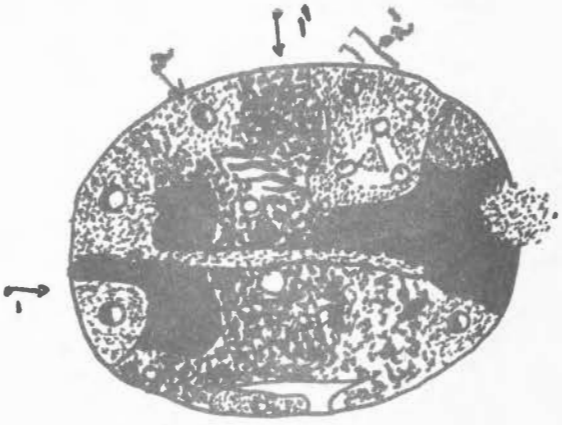


Fig. 14. Map of Plato by T.E. Howe. 4-inch refl., 168X.

levels, where the eastward deviation would be more marked.

A.L.P.O. observers are also in general agreement that short-term variations of transparency of the Venusian atmosphere do occur. This, of course, would favor visibility of lower-level atmospheric phenomena even without the aid of red light. Support for such belief is also furnished by the experience of Ross, who found the atmospheric markings revealed by ultraviolet to be ever-changing. Moreover, Ross was moved to experiment with the unlikely ultraviolet largely because prior attempts at photography by infrared had given negative results. Paradoxical as this appears, it is easily explained if the Venusian atmosphere chanced to be more than usually opaque at the time the infrared pictures were attempted. One thing is certain. The writer has noticed many times that red filters have failed to reveal any markings whatever on the disc, while at other times they have brought them out strongly. This can hardly mean anything but short-term variations in Venusian atmospheric transparency, other factors remaining equal. [It is a curious fact that the late L. J. Wilson in 1940 and 1941 photographed in red light Venusian features looking very similar to those photographed by Ross in ultraviolet in 1927. - Editor.]

The Bright Spots

Observations by Cragg, Bellot, Cluff, Johnson, Osawa, Ranck, and Bartlett have shown the presence of local bright spots on the disc, independent of the cusp-caps or the limb-band. In Fig. 5 three such spots (indicated by dashed ovals) may be seen. Fig. 6, from Cragg, shows others. Both Bellot and Cluff show many similar spots on the morning crescent and gibbous disc. Selections from their drawings will appear in a later report. The nature of such bright spots is hardly open to question. They are almost certainly masses of cloud with mean elevations above the lower cloud strata. Phil Cluff has recorded several instances of the apparent projection of local bright areas above the bright limb, and a similar phenomenon was observed by the writer many years ago.[6]

Although the other observers do not mention independent movement of such bright spots, the writer was fortunate enough to observe and measure such movement in a spot first observed on July 6th, 1951, at $0^h\ 18^m$, U.T., T-5, S-4, 3.5 in. refl. at 100X. When first observed this spot was close to the terminator. Measurement from a drawing made 54 minutes later indicated a displacement in longitude of 14°4. Assuming a uniform rate of displacement, this would give 16°0 per hour, or 360° in 22 hrs., 30 mins. Such measurements, however, are of little value since clouds seldom move with a uniform rate, saving for brief periods, and are thus practically useless for determining planetary rotation periods. Ross found that the rapid movement of cloud masses photographed by him precluded their use as measures of the rate of rotation.

In a forthcoming report, however, the Recorder will discuss observations of other types which indicate a rotation period close to 24 hours, contrary to the generally accepted views.

References

1. Newcomb, Simon; Popular Astronomy; 1878; Harper and Brothers, N.Y., p. 298.

2. Longwell, Knopf, Flint, Schuchert, and Dunbar; Outlines of Geology; 1941; John Wiley & Sons, Inc., N.Y.; Part 2, p. 70.

3. Whipple, Fred L; Earth, Moon, and Planets; 1941; The Blakiston Co., Philadelphia; p. 201.

4. Cave, T.R.; Recent Observations of Venus; The Strolling Astronomer; September, 1951; p. 6.

5. Whipple, Fred L; Earth, Moon and Planets; 1941; The Blakiston Co., Philadelphia; Fig. 122, p. 197.

6. Bartlett, J.C.: Report on the Venusian Markings; Maryland Academy of Sciences Bulletin; October, 1927; p. 59.

SECOND REPORT ON JUPITER, 1951-52

by Ernst E. Both

During October, November, and December, 1951, observations of Jupiter were received from the following members: J. C. Bartlett, Jr. (3.5-inch refl.), E. E. Both (6-inch refl., 8-inch refr.), E. Epstein (6-inch refl.), T. E. Howe (4-inch refl.), L. T. Johnson (10-inch refl.), P. A. Moore (8.5-inch refl.), T. Osawa (6-inch refl.), O. C. Ranck (4-inch refr.), E. J. Reese (6-inch refl.), M. Robins (3.5-inch refr.), and T. Saheki (8-inch refl.).

There has been considerable confusion among our observers because of an error in the First Report on Jupiter in your November, 1951, issue of The Strolling Astronomer. On pg. 11 in the description of the Disturbance in the South Temperate Belt please read "E. Both" instead of "E. Epstein". The Disturbance recorded by Epstein was not the same as the one observed by Both and Bartlett. Epstein's Disturbance was situated on the south border of the S.T.B. and had the following longitudes (II): on August 17, 41°; on August 22, 41°; and on August 31, 232° - surely a different Disturbance than the one observed on August 17 and 22. We hope to give a complete resumé of the Disturbances in the S.T.B. in the next Report. Meanwhile we urge again that all observers look through their notebooks for confirmation of either the Bartlett-Both Disturbance or the Epstein Disturbance.

Zones. During October, November, and December, the North Tropical Zone and the South Tropical Zone appeared to diminish in brightness. The South Tropical Zone, however, was still a little brighter than the North Tropical Zone. No special structural change was observed in either the S. Tr. Z. or the N. Tr. Z. Most of the other zones were rather dull in appearance and were more or less equal in brightness.

The Equatorial Zone alone showed some interesting structure in recent months. T. Saheki, observing with an 8-inch reflector on August 8 at C.M. 180° (I) found the E. Z. to be "shaded in a yellowish color, and it showed many white to yellow spots", giving the zone a granulated appearance. Saheki saw this appearance again on August 10 at C.M. 172° (I): "dusky yellowish gray, with many yellowish or white spots." On August 11 at C.M. 332° (I) Saheki noted: "rather shaded, many spots or streaks being glimpsed". The E. Z. appeared to continue to show many white to yellow spots in the succeeding months, as recorded by many observers (Both, Ranck, Saheki, and others).

Belts. Color estimates of some of the belts were secured by E. E. Both during November and December. Working with a 6-inch reflector and an 8-inch refractor, Both found the following colors: North Temperate Belt, dark brownish gray; North Equatorial Belt, reddish brown changing to brownish gray in December;

South Equatorial Belt, brown with a yellowish tinge; South Temperate Belt, gray and rather dull.

Some of the belts showed very interesting appearances:

South Temperate Belt. On August 7 at C.M. 235° (II) Saheki observed; "S.T.B. strongly seen but very irregular in shape". Again on August 8 at C.M. 37° (II) he noted: "The S.T.B. is the darkest belt.... [It is] bluish dark gray showing white spots of great intensity". Again on August 27 at C.M. 32° (II) Saheki remarked: "The S.T.B....is the darkest belt, strongly defined but rather irregularly shaped." The S.T.B. was one of the most interesting features on the planet in October, November, and December, showing a number of white spots and at times being very irregular in shape. A complete resumé of both the many dark spots in the N.E.B. and the interesting white spots in the S.T.B. will appear in our next Report.

North Equatorial Belt. This belt was also very dark; but the number of black spots ("First Report on Jupiter in 1951,"The Strolling Astronomer, Vol. 5, No. 11, 1951), which had been so conspicuous during July, August, and September, appeared to decrease during October and November.

The Polar Regions. These were in interesting contrast to each other. The South Polar Region, as observed by Saheki, Osawa, Both, Ranck, and others in August-October, was distinctly bluish gray in color and changed very little in either color or appearance. The North Polar Region, however, appeared to be more unstable in both color and appearance. Its color changed from a dusky bluish gray in August to a dark cool gray in September and to a more brownish gray in the following month.

Festoons and Gaps. Although the number of dark spots in the N.E.B. appears to have decreased since earlier in the apparition, some very unusual long and dark festoons, beginning in the N.E.B. and reaching deep into the E.Z., were frequently recorded. Saheki on September 5 at C.M. 337° (I) saw near the west limb two dark and straight festoons, reaching from the N.E.B. far into the E.Z. A similar festoon was recorded by L. T. Johnson on October 13 at C.M. 328° (I), also reaching from the N.E.B. into the E.Z.

The Red Spot. E. J. Reese has submitted a list of longitudes of the Red Spot as determined from central meridian transits, together with some estimates of its color. His results on longitudes are summarized below, where the number in parentheses is the number of transits on which each position given rests. The longitudes are all in System II.

	July-Aug.	Sept.-Oct.	Nov.
Preceding end Red Spot	240°5±0°8(4)	240°7±0°9(7)	244°0±0°3(6)
Center Red Spot	253.8±0.4(4)	255.6±1.1(9)	257.7±0.4(6)
Following end Red Spot	268.3±1.1(3)	270.0±1.6(9)	271.6±0.9(5)

[The Red Spot is clearly continuing the motion in increasing longitude which has characterized its rotation-period since 1936. However, this increase has proceeded at a very irregular rate. Up to 1936 the Spot had been moving in decreasing longitude at a fairly uniform rate for many years. - Editor.]

The color of the Red Spot was observed as yellow to orange ochre most of the time. However, Saheki found its color to be chiefly shadings of gray.

Summary of Observations in October-December, 1951.

1. The most conspicuous Zones were still the S. Tr. Z. and the N. Tr. Z., though both were diminishing in brightness.

2. The very irregularly shaped S.T.B. was at times darker than the N.E.B.

3. Although the N.E.B. had been conspicuous in July-September because of its many dark spots, the S.T.B. now showed many white spots, which were rather short-lived.

4. The E.Z. was very complicated in structure in that it appeared to consist of a great number of white to yellowish spots of irregular brightness and shape.

5. The Red Spot was rather faint.

OBSERVATIONS AND COMMENTS

A number of A.L.P.O. members observed Mars in the autumn of 1952, and T. Saheki and T. Osawa in Japan obtained results deserving great praise; but we shall defer discussing these observations until our next issue because of lack of space.

Figure 14 on pg. 22 is a map of Plato made by T. E. Howe from visual observations with his 4-inch reflector at 168X in September-November, 1951, and partly also from a photograph he took on October 13, 1951, (U.T. date) near colongitude 61° (about four days after sunrise on Plato). The near-central craterlet, at the intersection of the arrows marked 1 and 1', was shown on the photograph. Curiously, Mr. Howe has never yet seen this craterlet, although it is usually considered the brightest and most conspicuous one in Plato. At the intersection of the arrows marked 2 and 2' Mr. Howe has seen a ridge, a feature rarely observed in this position. Readers may wish to compare Figure 14 to drawings of Plato by several different observers published in The Strolling Astronomer in 1950 and 1951 and to E. J. Reese's map on pg. 5 of our January, 1952, issue. If agreement is far from perfect, it must be realized that the spots, streaks, and shadings in Plato are difficult objects, certainly for only four inches of aperture.

On November, 1952, near colongitude 30° Howe recorded a "mist" in the central portions of Plato. It would be very interesting to hear whether any other members observed Plato on November 9 (U.T.), and if so, whether they saw anything unusual. There is in the literature a number of examples of apparent lunar atmospheric obscurations of features on the floor of Plato, some of them recorded by skillful and experienced lunarians. At all events Plato will bear watching.

On December 7, 1951, at colongitude 9°.9 O. C. Ranck made a drawing of the huge, shallow enclosure containing Thebit, Birt, and the Straight Wall - the "lunar railway" of the imaginative Gruithuisen but actually a geological fault in the lunar surface. Mr. Ranck made the drawing with 480X on a 4-inch refractor and was very pleased with the quality of the view under such a very high power. Although the editor doubts that 480X can possibly be the most effective magnification with a 4-inch telescope, he would urge readers to experiment with

a very wide range of powers. You might just possibly find something more effective than what you now customarily employ.

In a letter dated December 26 Mr. H. G. Allen says in part: "I've seen color on the moon only once; and I think that it is the same as that which the Japanese observers saw, as mentioned on pg. 7 of the November, 1951, Strolling Astronomer. It appeared as a brownish shading over the gray area which includes the crescent-shaped crater northeast of Aristarchus. This area was bordered on the northeast by a watery yellow wash. I don't remember the date or the conditions under which the color was seen." Being with the American Army in Europe, Mr. Allen is not at present able to furnish additional details. Without them we can hardly decide whether or not he observed the colored lunar region examined by Saheki and Osawa in August, 1951. However, it will do no harm if lunarians will be attentive to the vicinity of Aristarchus.

Mr. A. W. Mount offers some additional comments on a cause of possible false lunar meteors, i.e., moving bright specks seen against the surface of the moon. His original discussion is on pg. 15 of our December, 1951, issue. Mr. Mount remarks: "One seeming fallacy of my assumption is that it is hard to see how a dust particle, crossing the focal plane image of the moon; can ever be actually brighter than the lunar surface. Of course, there will be some reflected light to illuminate the eyepiece side of the particle,perhaps some translucent effects, and possibly other effects as well. However, the eye and mind are easily deceived, especially on an unexpected event of very brief duration, where recording must rely entirely on memory and impression. In this case there would be contrast, and how our minds would work in recording relative brightness is anyone's guess."

The editor would conjecture that impressions of whether a moving object is brighter or darker than the background against which it is seen should be fairly accurate. Surely the rankest novice can tell whether a Jovian satellite seen projected against its primary looks bright or dark, when he is able to see the satellite at all. However, we thank Mr. Mount for his contribution to the subject; and as he has said, some experimenting might be informative.

R. M. Adams of Neosho, Missouri, has submitted two drawings of the lunar crater Conon, obtained with a 10-inch reflector at 288X and 430X. The first one is on December 7, 1951, at colongitude 11°1, and the second is on December 8 at 23°2. It is very curious, and extremely hard to explain, that the dark streak S of Reese, Hare, Brinckman, Haas, and others appears to be present in part as a bright streak on Adams' later drawing! On December 7 this reversed Streak S is shown extending far into the sunrise shadow in Conon, which then covered about half of the floor. Do we have a ridge paralleling Streak S and overlooked by all our observers for many years? On December 8 Adams drew an apparent low, rounded hill a little northwest of the center of Conon, which may well coincide with Reese's bright area O (Figures 5 and 6 on pg. 1 of our August, 1951 issue). Using a 6-inch telescope, Reese has never felt sure of the topographical nature of O. Four or five days after sunrise its position is covered by W. H. Pickering's large, triangular "floor cloud" in the northwest quadrant of Conon, then near its maximum size.

Mr. P. A. Moore writes that Mr. F. H. Thornton, an active lunarian in the British Astronomical Association, has observed a peculiar appearance in the crater Haze. Mr. Thornton has not yet described fully what he has seen; but he

urges that other observers examine Haze, particularly at sunrise. Rather high powers are recommended. Haze is easily identified as a ring-plain immediately southwest of the walled plain Petavius, on the west shore of Mare Fecunditatis, and having roughly half the diameter of Petavius. It is further characterized by a fair-sized craterlet, A, in its northwest portion. Haze (or Hase) can be quickly located on Section X of the Wilkins map, published in our August, 1951, issue. Sunrise here comes at colongitude 299° so that Thornton's appearance must be looked for on the young, crescent moon, which will ride high in the early evening sky in northern latitudes during the next several months. The following local civil time evening dates will afford excellent opportunities for observers in the United States: February 27 and 28, March 28, April 26 and 27, and May 26. Therefore, please direct your telescope to Haze on these dates; and let us know what you see, preferably by means of a drawing of the crater.

Mr. J. T. Carle of Fresno, Calif., who is one of the very newest members of the A.L.P.O., had a good view of the craterlets on the floor of the walled plain Plato on December 9 (U.T.) at colongitude 35°7 (about two days after sunrise). Using an 8-inch long-focus reflector at 180X, Mr. Carle drew seven craterlets; on Reese's chart, Figure 1 on pg. 5 of our January issue, six of these can be identified as follows: the near-central craterlet A, craterlet C in the southeast part of the floor, white splotch B in the east central part of the floor, the twin craterlets D northeast of A (Carle was not certain of dividing them), and spot i near the foot of the northeast wall. Carle's seventh craterlet is absent from Reese's chart and lies near the foot of the west-northwest wall but was hard to see. These floor craterlets in Plato are a fascinating study with adequate optics, say 6- to 12-inch telescopes of good quality. It has been the opinion of many skilled and experienced lunarians that the craterlets vary in conspicuousness from time to time quite independently of the solar illumination or the conditions of observation.

Mr. David P. Barcroft has communicated the following discussion under the title "Craterlet on Floor of Proclus":

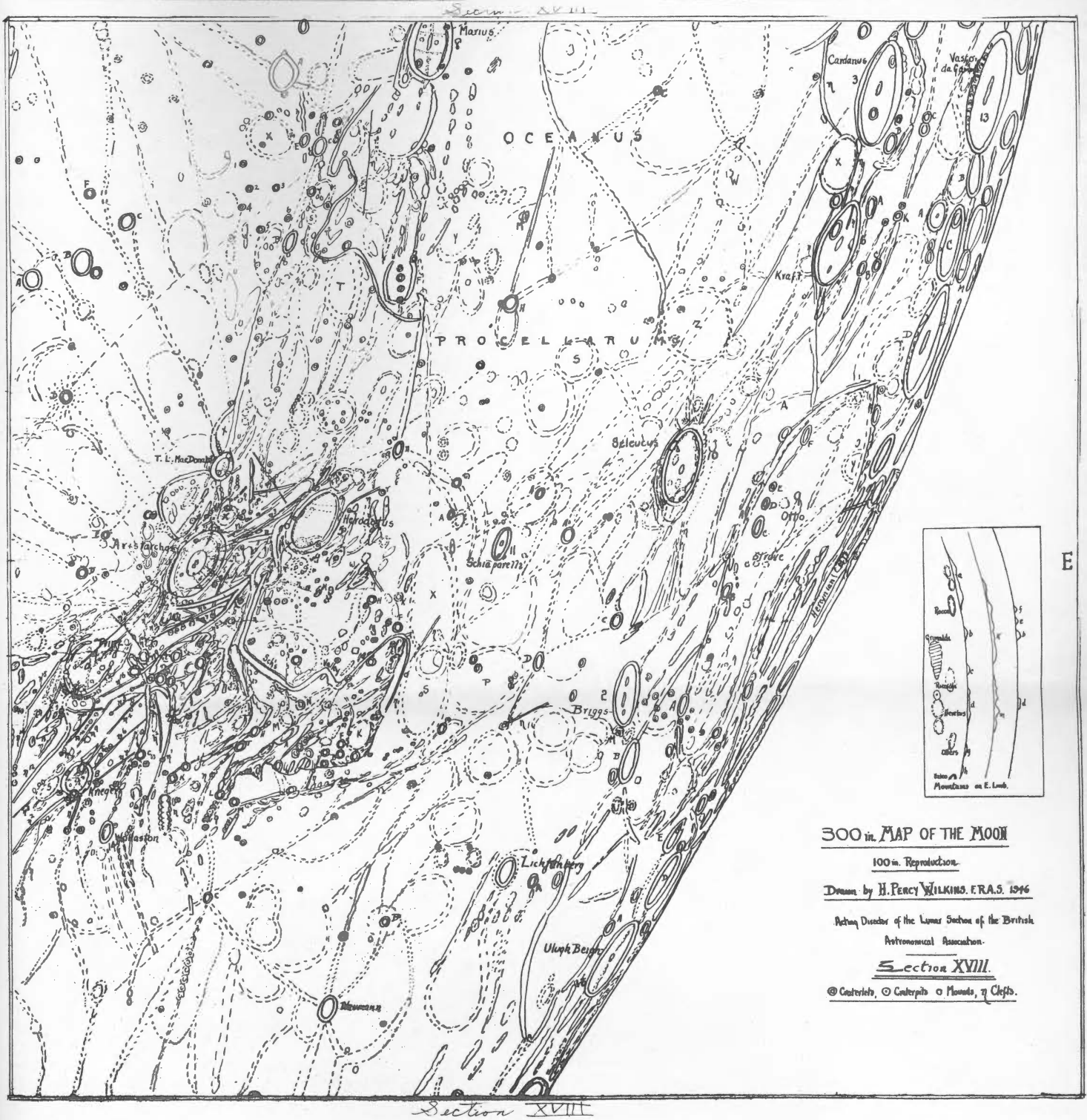
"On the night of Dec. 13-14, 1951, Thomas R. Cave, Jr. detected a craterlet on the floor of Proclus; and subsequent observations by Cave and David P. Barcroft on Dec. 14-15 were confirmatory of its reality. [The Universal Time dates were December 14 and 15, and the colongitude was near 98° and 111° respectively.] It is not one of the objects mentioned by Goodacre as being in or near the east and west walls. It is, however, close to the position where two small circular formations, adjoining each other, are indicated on the Third Edition of Director Wilkins' map, where Dr. S. M. Green saw two bright spots in 1938. (Eleventh Report Lunar Section B.A.A., page 20.)

"To Barcroft the central portion of the floor, which was well presented for observation, appeared lead-colored and had a mound-like appearance. On all sides save the east the central portion of the floor seemed encircled with a brown-colored band, which possibly extended up the west, south, and north inner walls for a short distance; and from this feature there were Aristarchus-like bands extending to the top of the white westerly walls. Cave saw three of these on each night; Barcroft saw them the first night but could only see two plainly the second night. On the first night Barcroft caught glimpses of two furrow-like features running north-and-south over the floor, and on the second night he saw what looked like a hillock on the floor southeast of the craterlet. The craterlet was lighter in color than the floor and appeared shallow.

"On December 15 from $8^h\ 1^m$ to $8^h\ 15^m$, U.T., rough sketches showing the craterlet were made at the telescope. Barcroft's is herewith; Cave's will be sent separately. Observations referred to were made at the Observatory of Thomas R. Cave, Jr., at Long Beach, California. Principal work was done with Cave's 12.5-inch reflector, powers up to 380X."

Barcroft has also communicated a drawing of Proclus by J. T. Carle with an 8-inch reflector at 180X on January 4, 1952, at colongitude 352°9, thus under forenoon lighting whereas Barcroft and Cave had observed under afternoon lighting. Mr. Carle recorded a small craterlet in the east part of the floor, a light-colored area in the northeast part of the floor, and several dark bands on the south, east, and west walls; moreover, he suspected a craterlet or bright spot in the northwest part of the floor.

Perhaps some of our readers would like to examine Proclus for themselves in oder to see whether they can confirm these features described by Barcroft, Cave, and Carle.



SECTION XVIII

OF

H.P. WILKINS 300-INCH MAP OF THE MOON

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