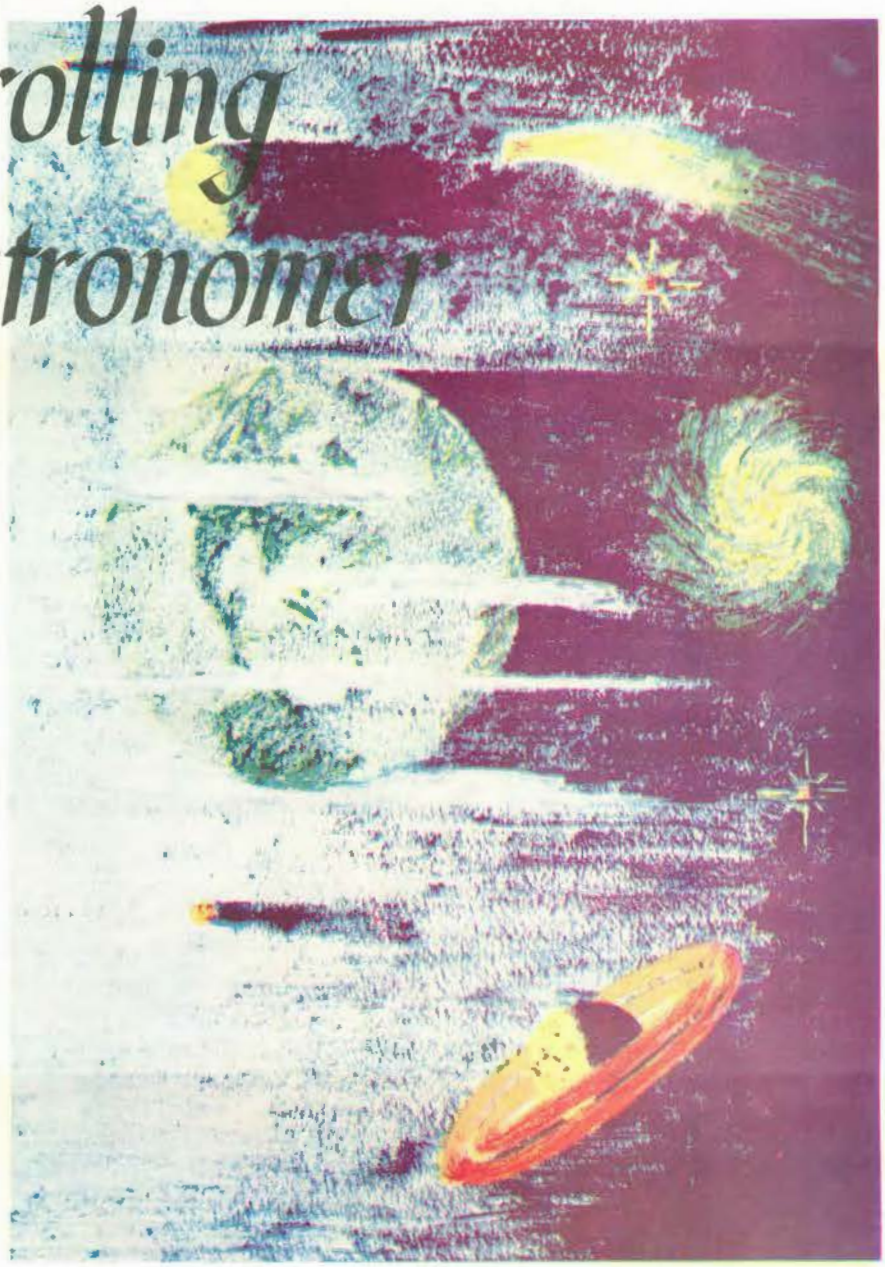
The Strolling Astronomer

Volume 5, Number 7 July 1, 1950

ASSOCIATION OF LUNAR AND PLANETARY OBSERVERS



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STAFF

-Editor-

Walter H. Haas
133 S. Alameda St.
Las Cruces, New Mexico

-Counsellor-

Dr. Lincoln LaPaz, Head of Mathematics Department
Director, Institute of Meteoritics
University of New Mexico
Albuquerque, New Mexico

-Acting Venus Recorder-

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265 Roswell Avenue
Long Beach 3, California

-Acting Jupiter Recorder-

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208 Kingsley Street
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-Acting Mercury Recorder-

Donald O'Toole
114 Claremont Avenue
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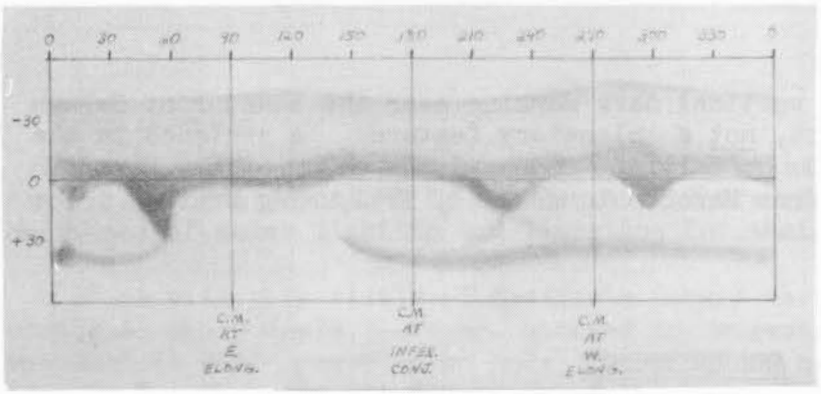


Fig. 1. Map of Ganymede in 1949. Drawn by E. J. Reese.

West ←

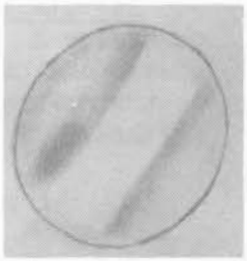


Fig. 2. Uranus. T. Saheki. 8-inch refl. 400X, 500X. March 8, 1951. $11^h\ 28^m$, U.T.

Fig. 3. Red tint west of lunar crater Lichtenberg observed by R. M. Baum on Jan. 21, 1951, at $18^h\ 21^m$, U.T. 3-inch refr. 100X, 120X. Colong. = 76°5

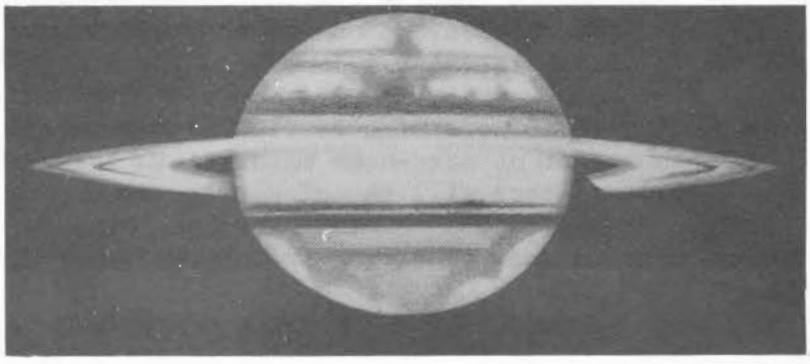


Fig. 4. Saturn
T. Osawa. 6-inch refl.
230X. March 30, 1951.
$16^h\ 50^m$, U.T.

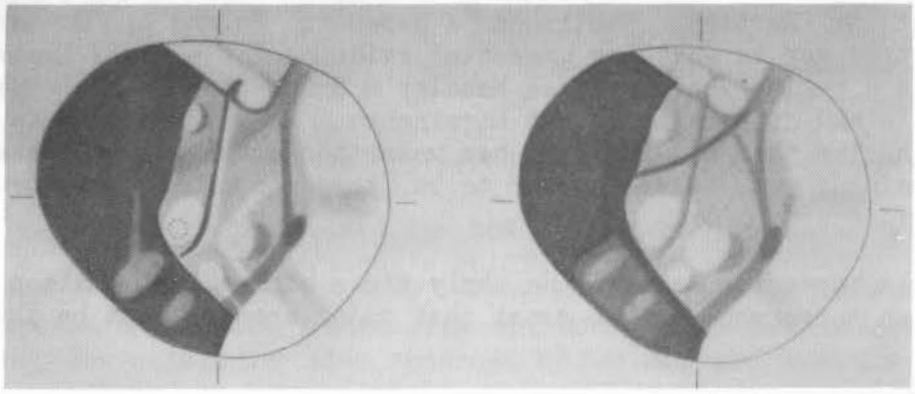


FIG. 5.
JAN. 28, 1950
$0^h\ 0^m$ U.T.
COLONG. = 22°.8
S5-7, T3-4
ORDER: U, V, Z, S.

CONON
6-IN. REFL., 240X
E.J. REESE

FIG. 6.
NOV. 19, 1950
$2^h\ 30^m$ U.T.
COLONG. = 22°.5
S5, T3
ORDER: U, S, Z, V, a.

Errata in June issue. The vertical dark marking near the equator of Saturn on Figure 4 on pg. 1 is a defect, not a planetary feature. A sentence in the lower part of pg. 13 should read: "Bartlett compared the color of the east and west ring-arms on 24 occasions from March 6 to April 1, 1951, using Wratten color filters."

ANNOUNCEMENTS

Bulletin for the Coastal Planetary Observers. This title is that of a mimeographed monthly periodical issued by a group of young and enthusiastic planetary observers in Venice, California. The mailing address is c/o Mr. John Merritt, 3542 Greenwood Ave., Venice, Calif. The June, 1951, issue contains 7 pages. A number of reproductions of planetary drawings appear in each issue. The Bulletin features news of interest to planetary observers in the Los Angeles area. Its editors welcome observations, suggestions, and articles.

Astronomical League Convention and Annular Eclipse. We remind our readers of the National Convention of the Astronomical League at Chapel Hill, North Caroline, on September 1-3, 1951. The Convention Chairman is Mr. G. R. Wright, 202 Piping Rock Drive, Silver Spring, Maryland. The Convention will stress instruction in methods of observing meteors, variable stars, sunspots, and planets. A large amount of take-home material in these fields of observation will be distributed. There will be, of course, papers on astronomical subjects, exhibits, and a demonstration of the Morehead Planetarium of the University of North Carolina. Plan now to attend and to meet your astronomical friends and colleagues!

A novel feature of the League Convention is the near-sunrise annular eclipse of the sun on September 1. Detailed information upon its visibility is given on pp. 196-197 of Sky and Telescope for June, 1951. Various possible observing programs are outlined by Mr. Paul W. Stevens in the May, 1951, issue of the same magazine in an article called "The September Annular Eclipse." Observers in a limited area in North Carolina and Virginia will be treated to a highly dramatic natural spectacle.

EDITORIAL FOREWORD

Some lively correspondence has been carried on in recent months among J. C. Bartlett, Jr., D. P. Barcroft, E. J. Reese, P. A. Moore, and the Editor upon the subject of Maedler's Square. It should be stated for the benefit of our new readers that Dr. Bartlett published a paper in Volume 4, Number 12 of The Strolling Astronomer in which he presented evidence for a major lunar topographical change in a region designated as Maedler's Square and lying between the crater Fontenelle and the walled plain Birmingham. New developments since last December emphasize that Dr. Bartlett has unearthed a real lunar mystery! As Mr. Reese has pointed out, there appear to be three possible interpretations of available evidence:

1. The discrepancies between the early views of Maedler, Neison, and others and the modern appearance are so great that major changes must be invoked to explain them.

2. No change has occurred. The early observers gave flowery and inexact descriptions.

3. Both early and modern observers are essentially correct. The curious geometric patterns described by Maedler and others require special and infrequent conditions of solar lighting and libration for their manifestation.

It is with this riddle of Maedler's Square that the following article by Mr. Patrick A. Moore deals. We are honored to present this paper by Mr. Moore and hope that it will prove to be only the first of his contributions to this periodical. Mr. Moore is the Secretary of the Lunar Section of the British Astronomical Association and is well known in lunar and planetary circles in England. He is the translator of G. de Vaucouleurs' Le Problème Martien from French into English. Our contributor's address is Glencathara, Worsted Lane, East Grinstead, Sussex, England. Mr. Moore invites correspondence on lunar and planetary matters from A.L.P.O. members.

Figure 3 on pg. 5 is a composite drawing of Maedler's Square and vicinity constructed by E. J. Reese from the following:

1. Yerkes Observatory photograph M2 on November 21, 1901, at colongitude 25°.

2. Lick Observatory photograph M3 on January 11, 1938, at colongitude 38°.

3. A sketch by E. J. Reese with a 6-inch reflector on March 18, 1951, at colongitude 31°.

The use of photographs for Figure 3 should insure a high degree of positional accuracy and of correct proportions of features. Figure 4 on pg. 5 is a drawing of Maedler's Square by Mr. Tsuneo Saheki obtained during the same epoch as Mr. Moore's map of the region (Figure 2 on pg. 5). The discrepancies among the modern observers whose work is presented as Figures 2, 3, and 4 on pg. 5 appear rather great to the editor - perhaps great enough to cast doubt upon whether the discrepancies between "ancient" and "modern" observations need be attributed to a change upon the moon.

MAEDLER'S SQUARE

An Alternate Interpretation

by Patrick A. Moore, F.R.A.S.

The valuable and intriguing article by Dr. Bartlett, published in Vol. 4, No. 12 of the "Strolling Astronomer", has aroused a great deal of interest, not only in America but also in Britain. Here, indeed, is a lunar puzzle worthy of the closest investigation. We are faced with the complete disappearance of a lofty and well-marked wall, marking the south-eastern boundary of a conspicuous and even artificial-looking formation referred to as "Maedler's Square".

It may be as well to recapitulate for the benefit of those who have not had the advantage of reading Dr. Bartlett's original paper. Maedler, the great German selenographer of the last century, recorded a regular enclosure with high linear walls between the crater Fontenelle and the large but battered walled plain Birmingham; the object was also recorded by Neison, who described it as "a perfect square, enclosed by long straight walls about 65 miles in length, 1 in breadth, and from 250 to 300 feet in height" ("The Moon", p. 252). This enclosure is today incomplete, lacking the massive S. E. wall recorded so definitely by Maedler and Neison. Moreover, two ridges in the western part of the interior

forming a perfect "Latin Cross", shown by Maedler and Neison, are no longer there; on the other hand, there is a conspicuous mountain mass some twenty miles S. W. of Fontenelle that Maedler and Neison either misplaced or totally omitted.

On these grounds Dr. Bartlett and Professor Haas suggest that a definite change has taken place, transforming the S. E. wall of the Square into the long and inconspicuous winding ridge of today. The present writer cannot agree with this conclusion, and my paper is an attempt to show that the discrepancy is due entirely to one of Maedler's rare errors.

Let us first make an effort to limit the period during which the alleged change could have occurred. Schmidt, in 1874, drew the Square as it is now; this is the latest limit given by Bartlett. I have spent many hours searching through the files of the Royal Astronomical Society and British Astronomical Association, as well as the material in my own possession, and have found a drawing by Celoria, made in 1870, and a good photograph by Draper as far back as 1863, both of which show the Square unmistakably in its modern form. Celoria's drawing is rather crude; but in the Draper photograph Fontenelle and its environs are close to the terminator, and there can be no possibility of error. It is absolutely certain, therefore, that if a change occurred it took place between 1837, when Beer and Maedler's "Der Mond" appeared, and 1863.

The earlier photographs having proved inconclusive, I turned to the maps and drawings made before 1837. Most unluckily, the area is not included in Lohrmann's original four sections. It will be remembered that this famous observer commenced drawing a lunar map on a large scale but after only four sections had been completed was halted by failing eyesight; the map was subsequently finished by Schmidt but did not appear until 1878, fifteen years after the Draper photograph, and is therefore useless for our present purpose. Cassini's very rare map, constructed many years before Maedler's, is inaccurate in the Fontenelle area but does not show the Square at all, which may perhaps indicate that the formation was not then conspicuous enough to catch Cassini's attention.

But the vital testimony is that of the much-maligned Schroeter, whose defects as a draughtsman are far outweighed by his merits as an observer. Schroeter never constructed a complete lunar map, but he did make a large number of drawings; and after a protracted search I discovered one of the area concerned, made in 1809. It is reproduced as Figure 1 on pg. 5; and, as will be seen, the mountain mass (e) is shown in its correct place, the south-east wall of Maedler is omitted, and the low, serpentine ridge is faithfully recorded.

Before trying to come to any conclusions about the conflicting records, let us examine the area in its present state. I sketched it in April, 1951, with my $8\frac{1}{2}$-inch reflector, powers from 200 to 400, under fair conditions; and my results are contained in Figure 2 on pg. 5. Three of the walls of the Square are clear enough, but only the western one (d) is of any altitude - this is the wall adjoining Birmingham. It ends to the north in the quadrilateral B, which is bounded by four hills connected by very low ridges (necessarily somewhat exaggerated in the drawing), and contains much fine detail, including one very low-walled crater (f). The quadrilateral is omitted altogether by Neison, and is only partly shown in Dr. Bartlett's own drawing. It is not at all conspicuous in Wilkins' map; and as I had not looked at the area for some time (I can find no previous personal sketch of it), I was frankly surprised at its prominence under some illuminations. It is clear enough on some photographs I have since examined. The wall h, connecting B with Fontenelle, is very low indeed and shows signs of having cut through one or two old enclosures whose walls have been completely

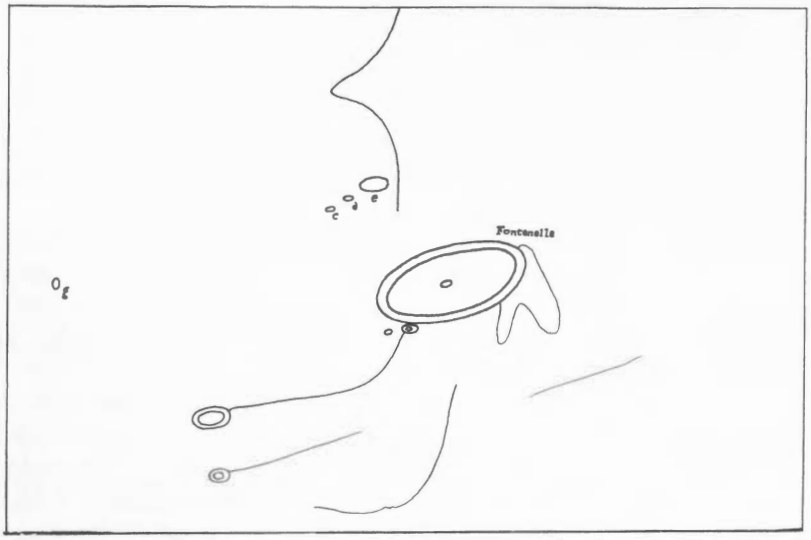


Fig. 1. Drawing of Maedler's Square and Vicinity by J. Schroeter in 1809. (Trace by P. A. Moore)

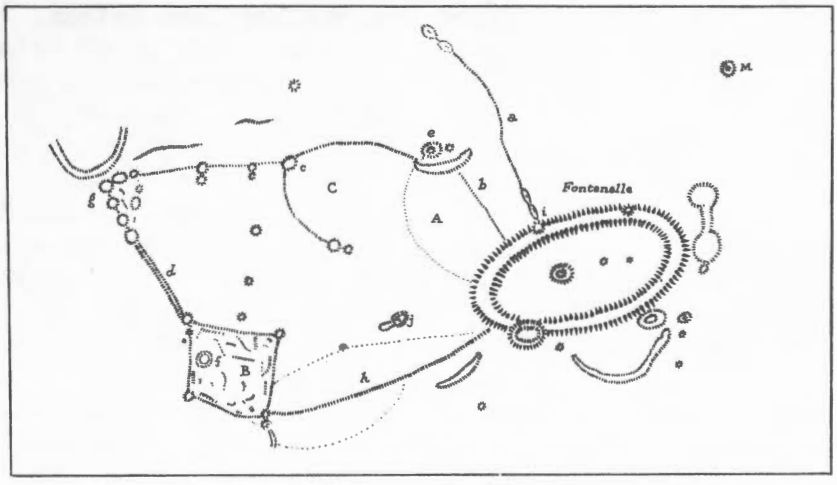


Fig. 2. Map of Maedler'sSquare by P. A. Moore in April, 1951. 8.5-inch refl., 200X-400X.

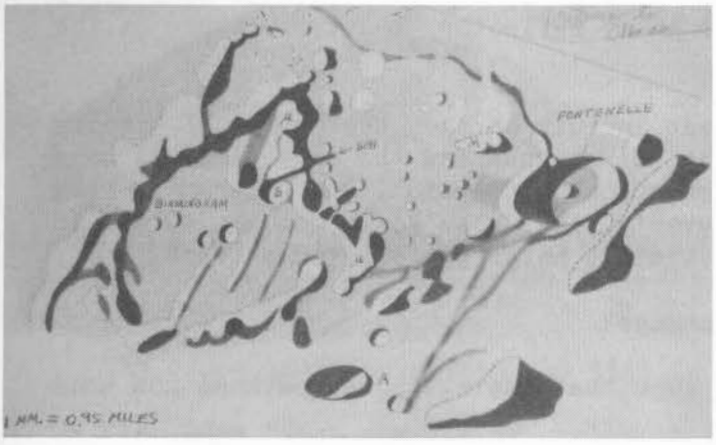


Fig. 3. Composite Drawing of Maedler's Square and Vicinity by E. J. Reese.

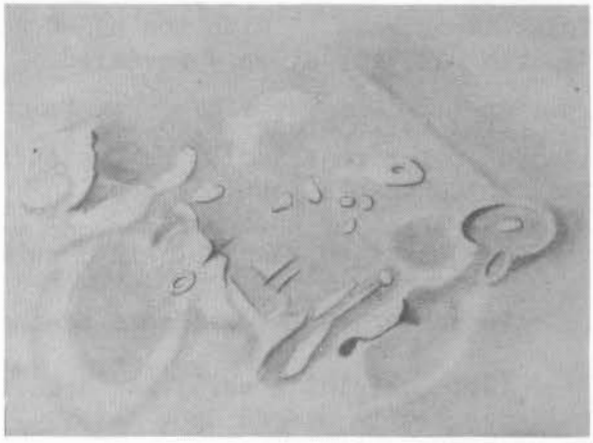


Fig. 4. Maedler's Square. T. Saheki. 8-inch refl. 222X. April 17, 1951. $10^h\ 42^m$, U.T. Colong. = 39°9

levelled so that the enclosures can now be traced only by their slightly darker hue. The other end of the main wall d is marked by a series of heights (g), very conspicuous at times and well shown in the drawing by E.J. Reese illustrating Dr. Bartlett's paper. The wall connecting g to the mountain c is again very low indeed and is perhaps discontinuous; peak c lies on the wall of a very old ring C, about half of whose ramparts can still be traced. The mass e is prominently shown by all the modern observers, as well as by Schroeter; Reese's June 19 drawing shows the main component as a crater, not a mere peak, and this I can confirm. Neison shows something near here, but if his "e" is in fact identical with mine it is far too small and is somewhat misplaced. We now come to an important point. From my observations the wall b, that is to say the famous south-east wall of Maedler and Neison, still exists, although it is extremely low and has to be caught under favourable conditions of illumination. It is definitely not identical with the serpentine ridge a, shown by Schroeter and modern observers but omitted by Neison. Wall b forms the boundary of a very ancient formation A, whose western wall is now traceable only as it marks a slight change in surface hue.

Several facts emerge from this research. The authorities for the former existence of the complete regular Square are Maedler and Neison. It is known that Neison relied largely on "Der Mond" for his map; and in my opinion his evidence is virtually worthless as he published his map, showing the complete Square, thirteen years after we know that it had "disappeared". Bartlett points out that Schmidt had published a correct version two years before Neison's book appeared; but the Draper photograph puts a different complexion on matters, particularly as Neison made most of his observations between 1866 and 1876 and did amazingly little lunar work after 1883. The Rev. T. W. Webb observed the area frequently in his search for the Latin Cross (about which more anon) but states in the 1881 edition of his "Celestial Objects" that the walls of the Square "are very unequal in height, and one is little more than a light streak".

We are therefore forced back solely to Maedler. During the period 1827-1837 the great German observer ranged over the entire Moon, and as he was using a comparatively small telescope - a 3-3/4 in. refractor, occasional inaccuracies are only to be expected. For instance, he records a crater in the northern Heinsius area that does not exist - and once again Neison copies him! The whole area of Wilhelm I. is inaccurate in "Der Mond", and there are other examples.

In the case of the Square, such an error is excusable; in my 3-inch refractor it sometimes looks more or less complete, as the low altitude of wall b is compensated for in part by the darker hue of area A, which gives the boundary a false importance. With the added power of my reflector, the true nature of the "fourth wall" is at once revealed.

The Latin Cross also seems to rest mainly on the testimony of Maedler (Neison being rejected). Webb states that Birmingham saw the object; but I have been quite unable to track down the observation in question, and apparently Webb himself was never successful. At all events, the Cross does not now exist in the form shown by Maedler; and I submit that it never has existed as such!

To summarize the evidence against change:

(1). Cassini's early map does not show the Square, though perhaps not much reliance can be placed upon this.

(2). Schroeter, in 1809, drew the area as it is today; and Schroeter, despite his clumsy draughtsmanship, made surprisingly few bad mistakes.

(3). Neison drew and described the complete Square thirteen years after we have proved that it was non-existent. This indicates that he leaned very heavily on Maedler, and his testimony is therefore of little value. The Heinsius case emphasizes this.

(4). With lower powers the Square can sometimes look complete, as the S.E. wall actually exists, though it is very low, and also marks a change in hue of the surface.

(5). The only real authority for the original completeness of the Square is then Maedler - who was human enough to err sometimes.

The real mystery is that Schmidt apparently made no comment about the obvious discrepancy between his map and Maedler's - but neither, to my knowledge, did anybody else until the publication of Dr. Bartlett's paper. Moreover, it must be remembered that Maedler died as recently as 1874; and it is just possible that the question was dealt with in private correspondence between him and Schmidt.

Taking all the facts into account, therefore, it seems that the evidence for change is totally inadequate, quite apart from the intrinsic improbability of any large-scale alterations in an area of this nautre. What has been proved, however, is a major error by Maedler and a piece of insufficient checking by Neison. The whole question is of absorbing interest, and lunar observers will be most grateful to the author of the original paper for raising it. I suggest that it would be a fitting gesture to attach the name of "Bartlett" to the curious formation that has been referred to in this paper as Maedler's Square.

SECOND EDITORIAL FOREWORD

We are honored to present a second article by a second new contributor, Mr. R. M. Baum, c/o Stock Lane Post Office, 1, Dee Bank, Boughton, Chester, England. Like Mr. Moore, Mr. Baum is an active observer in the Lunar Section of the British Astronomical Association; and like Mr. Moore again, he has illuminated for us a very interesting lunar subject. Our colleague has been composing an extensive catalogue of lunar maps and textbooks - a work of considerable magnitude, as lunar students can easily imagine! The completed catalogue is to be distributed privately, and Mr. Baum has kindly agreed to furnish the A.L.P.O. with a copy. He will be glad to discuss lunar affairs in correspondence with interested A.L.P.O. members.

Apart from its intrinsic interest, the report below of a red color near the lunar crater Lichtenberg may be regarded as an excellent model of how observations should be recorded. The seeing, or atmospheric steadiness, is here expressed on a scale of zero (worst) to ten (best). Carefully recorded observations such as appear below are worth many hundreds of random, casual views or of poorly remembered, unwritten observations. Beginning observers can very profitably imitate the procedure followed by Mr. Baum.

The exact location of the red tint is shown by Figure 3 on pg. 1.

When Baum first saw the red color at $18^h\ 19^m\ 10^s$, U.T., on January 21, 1951, the colongitude, or the lunar eastern longitude of the sunrise terminator, was $76^\circ.5$. This same colongitude will exist again in 1951 near $8^h\ 0^m$, U.T., on

August 16 and near $8^h\ 10^m$, U.T., on October 14; many other future dates can be found by using The American Ephemeris and Nautical Almanac. Searches on August 16 and October 14 are hence strongly recommended to amateur observers in the United States and Canada. Of course, if the red color is very sensitive to small changes in the sun's selenographic latitude and in libration, it may well fail to reappear on the dates mentioned. Even so, the area deserves attentive observing from students of the moon.

On October 18, 1940, at colongitude 114°.6 D. P. Barcroft observed a reddish brown or orange tint around the crater Lichtenberg, using a 6-inch reflector at 96X and 144X. He saw the color again on October 19 at colongitude 126°.6, and it was still faintly present on October 22 at 163°.1. He later observed this color in other lunations. In 1941, 1942, and 1943, W. H. Haas made 28 observations of a dark area west of Lichtenberg with a 6-inch reflector and an 18-inch refractor. Sometimes a copperish tone of variable intensity was noted; sometimes the area was instead bluish, purplish, or even gray. The color as observed by Haas appeared to undergo changes quite independent of the solar lighting. The copper tone was intermittently visible over almost all of the time that Lichtenberg is in sunlight. It appears doubtful that Barcroft and Haas have observed the same phenomenon as Baum, and it is also uncertain that they have recovered Maedler's famous red tint.

OBSERVED RED TINT WEST OF THE LUNAR CRATER LICHTENBERG

by R. M. Baum

While engaged upon a general survey of the region north of the great ringwall Otto Struve on January 21, 1951, a curious phenomenon was detected towards the lower reaches of the telescopic field. Suspecting that this definite red tint - for such was the appearance - was due to optical causes, the area was closely studied, first while at the edge of the field of view, then at the center, at which point the red tint became a little brighter and clearer in appearance and showed itself to be purely local in extent.

From the detection of the color at $18^h\ 19^m\ 10^s$, U.T., until its apparent fading at $18^h\ 38^m\ 29^s$, U.T., four estimates of the position of the central region were made, from which it would appear that the center lay at latitude 31° 24' 15" N., longitude 66° 10' E.

The following remarks from my journal give the complete observations of this remarkable phenomenon:

"1951, January 21. $18^h\ 19^m\ 10^s$, U.T. 90X. Seeing 7. While sweeping area to the north of O. Struve a tiny red spot was detected in lower reaches of telescopic field, apparently west of Lichtenberg. Optical effect?

"$18^h\ 20^m\ 36^s$, U.T. 90X. Seeing 7. Spot in center of field, of a delicate rose shade and purely local. Lunar surface around the tint gray and drab-looking. Sketch made. [Figure 3 on pg. 1.]

"$18^h\ 25^m$. 100X. Seeing 7. Spot has taken on a nebulous appearance, extending over a larger area.

"18h 30m 20s. 100X. Seeing 9.5. Really fine moment of seeing: it is fortunate indeed to have such a fine spell of seeing during a rare phenomenon, as is being watched now. In the spot no decided change has taken place; the extent and color remain as before. Estimate of position places center at longitude 66° 10' E. and latitude 31° 24' N.

"18h 31m. 100X. Seeing 9.5. Position of center longitude 66° 08' E. and latitude 31° 25' N. Suspected fading, though uncertain.

"18h 33m 16s. 100X. Seeing 9.5. No change in appearance, position of center longitude 66° 10' E. and latitude 31° 23' N.

"18h 37m 20s. 100X. Seeing 9.5. Fading of spot detectable; the nucleus is no longer rosy but is taking on a grayish or ashen appearance. The fainter shading surrounding the nucleus is very difficult to detect. Center estimated as at longitude 66° 12' E., latitude 31° 25' N.

"18h 38m. 100X. Seeing less than 8. Conditions deteriorating, clouds forming. Spot barely visible, no longer a bright glaring red but shot through with an ashen gray pallor.

"18h 38m 29s. 100X. Seeing less than 5. No longer visible, area grayish in color, no trace at all of the nucleus.

"20h. 90X. Seeing 6. Suspicion of area? A closer study reveals no trace which can be recognized as belonging to the red glow of an hour or so ago.

"20h 15m. 90X, 100X. Seeing more than 6. Definitely no trace of the area."

The instrument used during the observation was a 3-inch refracting telescope.

Whether the red tint is the "lost tint" of Maedler is difficult to say. Barcroft reported having observed a reddish tint west of Lichtenberg in 1938; but apart from this solitary observation, no one else appears to have detected it. [However, refer to the observations by Barcroft and Haas as described above-Editor.] So far as can be judged the actual tint observed by Maedler lay under the west outer wall of Lichtenberg, while in the observation here recorded the actual definite redness lay farther to the west, though a trace of a vague ruddiness extended over the dark zone and close to the wall. The reason that many observers have failed to detect the tint may lie in the fact that the observation of the color requires a certain definite altitude of the sun in the lunar sky along with certain libratory conditions and, last but not least, good seeing conditions.

As to the nature of this area, the observed color may just possibly be due to the reflection of the solar light from a deposit in a crystalline state. Indeed, it would be exceedingly difficult to explain such a phenomenon by any other means apart from natural coloration of the surface.

OBSERVATIONS AND COMMENTS

Figure 1 on pg. 1 is a map of Ganymede, or Jupiter III, as observed in 1949 by F. E. Brinckman, Jr., T. R. Cave, Jr., T. A. Cragg, W.H. Haas, H. Oberndorfer, and W. Sandner. The map was drawn by Mr. E. J. Reese, who was Jupiter Recorder of the A.L.P.O. in 1949. The telescopes employed in this study varied in aperture from 4 inches to 12 inches. Needless to say, large apertures score very

heavily in observing features upon the tiny disc of this satellite; and it is further obvious that excellent optics and steady seeing are the most important success. In drawing the map it was assumed that Ganymede always keeps the same face toward Jupiter (as the moon does toward the earth), and the zero meridian of longitude was taken as the one on the central meridian at a superior conjunction of the satellite. Mr. Reese's map may be profitably compared to Mr. E. E. Hare's discussion of detail recorded on Ganymede in 1950 (The Strolling Astronomer, Vol. 5, No. 3, pp. 8-10, 1951). If our successes with detail on this satellite to date have not been striking, a more serious effort with the larger and better telescopes available to A.L.P.O. members may still be definitely worthwhile.

H. Le Vaux has submitted a drawing of Uranus made with a 10-inch reflector and 400X on February 26, 1951 at 5^h, U.T., the seeing being very good. He depicts a white area near each of the south, west, north, and east points of the disc. A dark band lies along the central meridian of the disc, and two fainter bands perpendicular to it at its north and south ends are in the northwest and southeast quadrants respectively of the disc. Figure 2 on pg. 1 is a drawing of Uranus by T. Saheki, which has already been described on pp. 12-13 of our June issue.

Mr. E. J. Reese invites attention to two of his drawings of Conon, which are reproduced as Figures 5 and 6 on pg. 1. Quantity S is the seeing on a scale of 0 to 10, with 10 best; and quantity T is the transparency on a scale of 1 to 5, with 5 best. The two drawings were thus made under almost identical solar illumination (as measured by the colongitude) and under rather similar atmospheric conditions. The "order" given by Reese on Figures 5 and 6 is the order of decreasing conspicuousness of certain dark streaks on the floor, his nomenclature for features in Conon being shown on his map of the crater published in our February, 1950, issue. On Figure 5, "Cleft V" is very dark and conspicuous, lying in a north-south direction and being bordered on its east side by its own brightly sunlit wall; on Figure 6 "Cleft V" is faint and unnotable. On Figure 6 the curving "Streak S" in the south half of the floor is the darkest feature on the floor; on Figure 5 "Streak S" can scarcely be recognized. To the editor at least, such discrepancies between results secured by the same skillful observer with the same telescope, the same magnification, essentially the same solar lighting, and similar atmospheric conditions indicate very strongly that changes quite independent of the solar lighting occur upon the lunar surface. It is puzzling, however, that F. E. Brinckman on January 28, 1950, found "Streak S" very dark and narrow in an observation only 4 hours and 10 minutes after Reese's view on that date. May it be that very rapid changes sometimes occur in lunar features?

Photographs prove that "Fault B" in Conon, a dark streak at the foot of the northwest inner wall, was present and prominent in 1937 and 1938. Apparently qualified visual observers found it invisible or very inconspicuous in 1941 and 1942. By 1947 and early 1948 "Fault B" was often visible to visual observers as broken sections. In 1949 and 1950 it was continuous and prominent to them. Is is just possible that an obscuring lunar haze formed above "Fault B" between 1938 and 1941 and began to thin out in 1947, vanishing entirely in 1949? One could wish for more homogeneous evidence and a series of well-spaced photographs of excellent quality!

We have recently received drawings of Conon by T. Saheki with an 8-inch reflector on December 19, 1950, at colongitude $31^\circ.9$ and on April 17, 1951, at $39^\circ.7$ and by E. J. Reese with a 6-inch reflector on April 18, 1951, at $48^\circ.9$. In

their independent April views, which were about 18 hours apart, Saheki and Reese both drew a near-trapezium formed by dark streaks U, B, S, and Z. All four streaks were fairly conspicuous, though B was perhaps the easiest. They also agree well about three readily seen dark bands on the east wall of Conon and about a darker knot at the junction of streaks U and Z. Neither observer recorded any sign of "cleft V". Messrs. Reese and Saheki do differ rather widely, however, in their respresentations of several white areas on the floor of Conon, Reese's April 18 drawing appears to show a low mound or hill near the foot of the south inner wall.

In a letter dated May 9, 1951, Mr. Reese reiterates his confidence that a dark wall band in Aristarchus presented a very abnormal aspect on October 8, 1949, at $5^h\ 5^m$, U.T. Interested readers should review The Strolling Astronomer, Vol. 4, No. 9, drawings on pg. 1 and text on pp. 12-13, 1950.

Possessors of the Wilkins map of the moon are requested to note that Mount Barker on Section V has been renamed Mount Whipple, in honor of the first lunar photographer. Mr. Robert Barker had already been commemorated by the crater formerly called Sasserides B. Section V of the Wilkins map was published in our March, 1951, issue.

R. M. Baum wrote in part as follows on May 7:

"To dwell on certain lunar matters I mention that I have a decided leaning towards the views of Prof. W. H. Pickering as regards vegetation. On this point, early last year I undertook a short study of variable dark spots. The results were rather interesting, coming out as follows.

1. No spots found north or south of latitude 60° N. and 60° S. respectively.

2. Majority of spots near equator.

3. Families of spots; areas have a tendency to form groups.

4. Spots connected to cracks or small craters.

These are the salient features of the research. To my mind the areas are areas of some vegetational growth. Here [in England], however, these views are regarded with some reserve; a few observers do hold to such views, but only a few."

Mr. Baum's results in his general surveys of variable dark spots on the moon are similar to those obtained by W. H. Pickering more than 50 years ago and published in Volume 32 of Harvard Annals. Good examples of these dark spots can be found in the craters Alphonsus, Atlas, Eratosthenes, Riccioli, and Hansteen. The spots are most conspicuous and apparently darkest (but not necessarily absolutely darkest) under high solar illumination. They are thus well-developed far from the terminator and upon the full moon. An obvious test of whether or not these variable areas can be lunar vegetation is one that the Editor has proposed before, namely, whether their appearance on the earthlit moon is the same as on the full moon. Probably an aperture of 10 inches or more is needed for such an examination of the earthshine. The large telescope thus employed would not need to be of excellent optical quality; the problem is one of light-grasp.

Mr. Lyle T. Johnson, Box 187, La Plata, Maryland again invites amateurs in the Middle Atlantic States to join him in planned, cooperative, simultaneous searches for possible lunar meteors and lunar meteoritic impact-flares. Mr. Johnson spent a total of 120 minutes in such searches on April 10 and 11, 1951, using his 10-inch reflector at 221X. The diameter of the telescopic field of view was 13'. As usual recently, Johnson examined Grimaldi and its vicinity near the dark limb of the moon. These searches gave negative results except that a flash of stellar magnitude 7 was suspected at the south edge of the field of view at $2^h\ 39^m\ 30^s$ (within 15 seconds), U.T., on April 11. Telescopes as little as 6 inches in aperture can be profitably used in lunar meteor searches, though the increased light-grasp of large instruments is here a very important advantage.

We acknowledge with thanks the arrival of observations of the brightness of Uranus from J. A. Anderer, H. A. Le Vaux, W. A. Reid, D. W. Rosebrugh, and C. Tarwater. Other colleagues write of having been kept inactive by bad weather. Mr. Tarwater was the most active of the reporting observers and observed the brightness of Uranus on 12 dates from February 12 to April 25 (by P.S.T.). We remind A.L.P.O. members of the similar project with the brightness of Neptune described upon pp. 2-4 of our May issue. These warm summer evenings should be very pleasant for carrying out this simple program. We request that any still unreported observations of the brightness of Uranus in 1951 be sent to us at once.

Observations of Saturn in March, April, and May have been submitted by J. C. Bartlett, Jr.(3-5-inch refl.), T. R. Cave, Jr.(12.5-inch refl.),P. F. Froeschner (6-inch refl.), W. H. Haas (9-inch refl., 12-inch refl.), L. T. Johnson (10-inch refl.),P. A. Moore (8.5-inch refl.,3-inch refr.), P. J. Nemecek (10-inch refl.), T. Osawa (6-inch refl.),O. C. Ranck (4-inch refr.),and T. Saheki (8-inch refl.), Dr. Bartlett displayed remarkable energy in observing the planet 52 times on 38 dates from April 2 to May 31, a greater quantity of work than that compiled by all the other observers combined! We congratulate our Baltimore colleague on this very laudable performance.

Transits of satellite Titan across the face of Saturn were observed by Johnson on April 7 and by Cave on April 23. The satellite is so much less bright than the central portions of its primary that it appears black when projected against them, and both observers falsely supposed that they were watching the shadow of Titan. Johnson on April 7 estimated that Titan was on the central meridian of Saturn at $4^h\ 16^m$, U.T.; and this value agrees very well with the mean of $4^h\ 17^m.5$ found from the ingress- and egress-times listed in the 1951 Handbook of the British Astronomical Association. Cave comments on the beauty of the transit and remarks that contrasts were greatly enhanced in his 12.5-inch reflector beyond what they had been in past transits of Titan observed with his 8-inch reflector. These improved contrasts are a very important advantage of large apertures.

L. T. Johnson points out an error in our interpretation of an observation that he made in December, 1950. On pg. 13 of the April issue we stated that Johnson then saw a gap between the rings and their shadow, such being the Editor's interpretation of Mr. Johnson's report that he "resolved" the projected rings and their shadow. What Johnson meant, however, was that he could separately identify rings and shadow.

The rings were almost on edge during the period under discussion, for the Saturnicentric latitude of the earth diminished from 2°.8 on March 13 to 1°.0 on May 24. Between the same dates the Saturnicentric latitude of the sun increased

from 2°.6 to 3°.7. Both earth and sun lay north of the plane of the rings. The shadow of the rings on the ball was very prominent south of the projected rings in April and May; the shadow of the ball on the rings was also visible. Most of the observers could see Cassini's Division near the ansae and a black wedge of sky between the rings and the ball, as well as the difference in brightness between Rings A and B. It is remarkable that T. Osawa on March 30 in rather good seeing in addition recorded Ring C off the ball, Encke's Division near the ansae, and a greater darkness of Ring A outside Encke's (Figure 4 on pg. 1). Bartlett in early May thought that the rings were growing dimmer as they closed and that they were then no brighter than the dusky limbs of Saturn. Nemecak drew the rings darker than the ball on April 1. Johnson on April 24 and May 2 found the projected rings brighter than the east limb of Saturn but dimmer than the Equatorial Zone farther within the limb. In March and April Johnson drew the rings of the ball brighter than the temperate and polar portions of the planet. The projected rings were certainly hard to see with ordinary-sized telescopes.

On pg. 13 of our June issue we described a curious difference in color sometimes observed between the east and west ring-arms (west is to the left in a simply inverted view with south at the top). L. T. Johnson compared the two arms with his 10-inch reflector at powers of 221X to 526X on March 26 and April 7 and 10, using five Wratten color filters (red, yellow, yellow-green, green, and blue). He found the two arms always the same in color and brightness. J. C. Bartlett also made such comparisons with his 3.5-inch reflector at 100X and standard color filters. In 20 observations from April 2 to 29 Bartlett 13 times found the two arms the same yellowish white color. He 6 times made the west arm red and the east arm blue and once saw the reverse appearance. In 21 views from May 2 to 31 Bartlett 14 times saw no difference in color. Three times the west arm was red and the east one, blue; three times the west arm was red and the east one, yellowish white; once the east arm was yellowish gray and the west one, blue. As in the past, Bartlett thinks that the colors affect chiefly Ring A. He occasionally finds very rapid changes in the colors, including a very definite interchange of the red and blue arms on April 4 between $1^h\ 33^m$ and 4^h22^m. Such rapid changes suggest that the colors are illusions; however, such changes have been confirmed with color filters.

On pg. 13 of the June issue we mentioned Bartlett's curious experience that the west arm of the rings was dimmer when transparency was poor, although the two arms were equally bright in a clear sky. He repeatedly observed this effect in March and April; but it became somewhat variable in April, and during the latter half of May the arms remained equally bright with poor transparency. The mystery deepens! Have other readers seen any such appearances?

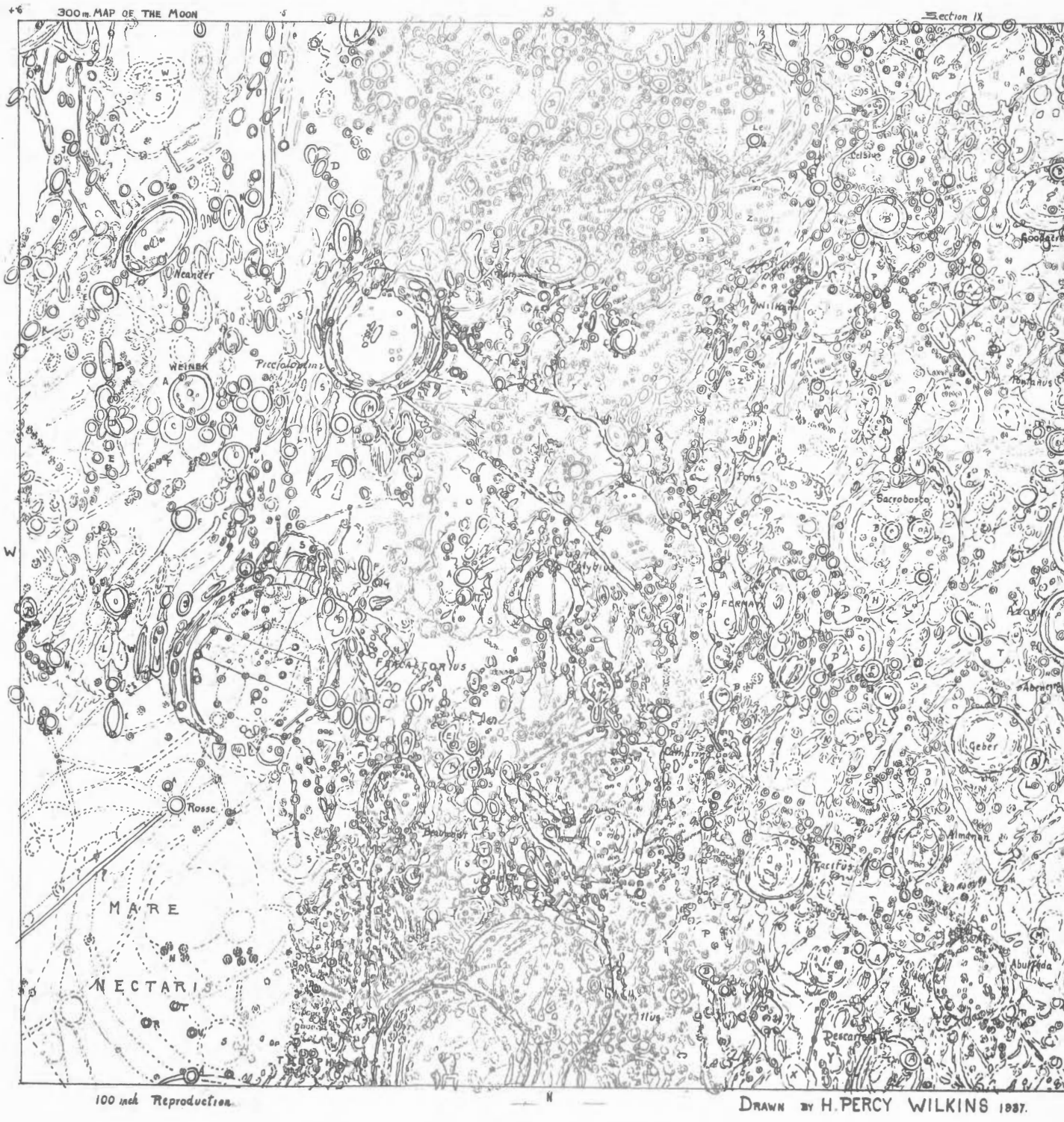
Although several observers paid some attention to the satellites of Saturn, only P. A. Moore estimated their brightness. It has been proposed that simple visual step-estimates of the relative brightness of these bodies are of value. Observing from mid-March to mid-April Moore found Tethys unexpectedly dim. On April 6 at $4^h\ 39^m$ Bartlett found Rhea about as bright as Titan, thus presumably abnormally bright.

Bartlett's observation on April 6 at $4^h\ 39^m$ may be very significant in another aspect. The night was very clear; and the seeing was rather good, as indicated by the sharpness of the ansae, the tininess of the images of the satellites, and the steadiness of the spurious disc of the star Arcturus. However, all detail on the ball was very faint and ill-defined; it was impossible to get a

sharp focus. Bartlett suggests as an explanation of this anomaly a general murkiness or haziness of the Saturnian atmosphere just above the visible surface; it would not be necessary to assume a planet-wide obscuration but only one affecting the two principal belts, one at a low latitude in each hemisphere. The incident is very forcibly reminiscent of the occasional large-scale atmospheric obscurations of Mars which cause portions of the planet to look vague and ill-defined under very favorable conditions of observation. Did Bartlett chance to witness some rare murkiness or haziness of the Saturnian atmosphere? With a potentially important observation of this kind it is extremely desirable to have confirmation by other observers. We hence urge that our readers examine any records of Saturn that they may have near $4^h\ 39^m$ on April 6, 1951, and report to us the appearance of the ball, which looked normal to Bartlett on April 4 and 7.

A dusky South Polar Region was usually drawn by most of the observers, though it occasionally blended with the dusky zones to its north so that the ball then looked uniformly shaded from the conspicuous South Equatorial Belt to the south limb. Bartlett in May frequently noted a small and very dark south cap on the limb. The color of the S.P.R. to Bartlett was usually brownish or grayish, rarely greenish. Johnson, Moore, and (occasionally) Bartlett recorded a South Temperate Belt about midway between the S.E.B. and the S.P.R.; and Osawa saw two faint belts near this position in his good view on March 30 (Figure 4 on pg. 1). The South Temperate Zone was dull to Bartlett, though much less dusky in April and May than in March; its color was usually brownish yellow, sometimes grayish yellow, occasionally greenish. Both tone and color changed rapidly and irregularly, according to Bartlett. This observer found the South Tropical Zone to imitate the tone and color of the South Temperate Zone until May 17, when it looked bright and unshaded for the first time since a lone observation on February 19. The S. Tr. Z. was yellow to Bartlett during the last half of May. On April 15 and May 23 Bartlett glimpsed a lacework of dusky festoons across the South Tropical Zone. An ill-defined and dim S. Tr. Z. was drawn by Saheki just south of the S.E.B. on March 8.

The South Equatorial Belt was wide, dark, and conspicuous; it consisted of two components, Ranck doing very well to divide them with only a 4-inch telescope. Bartlett found its color normally chocolate brown. The same observer saw many dark humps and bright bays at the south edge of this belt, while the north edge was flat. On one date he noted: "The general appearance was strikingly suggestive of a range of thunderheads as seen in the sky, i.e. a flat base from which arise tumbled masses of rounded cloud." Osawa on March 30 saw many dark projections at the south edge of the S.E.B. (Figure 4 on pg. 1). Several observers caught glimpses of much fine detail in this doubled belt, but it was too difficult to draw.



SECTION IX

OF

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