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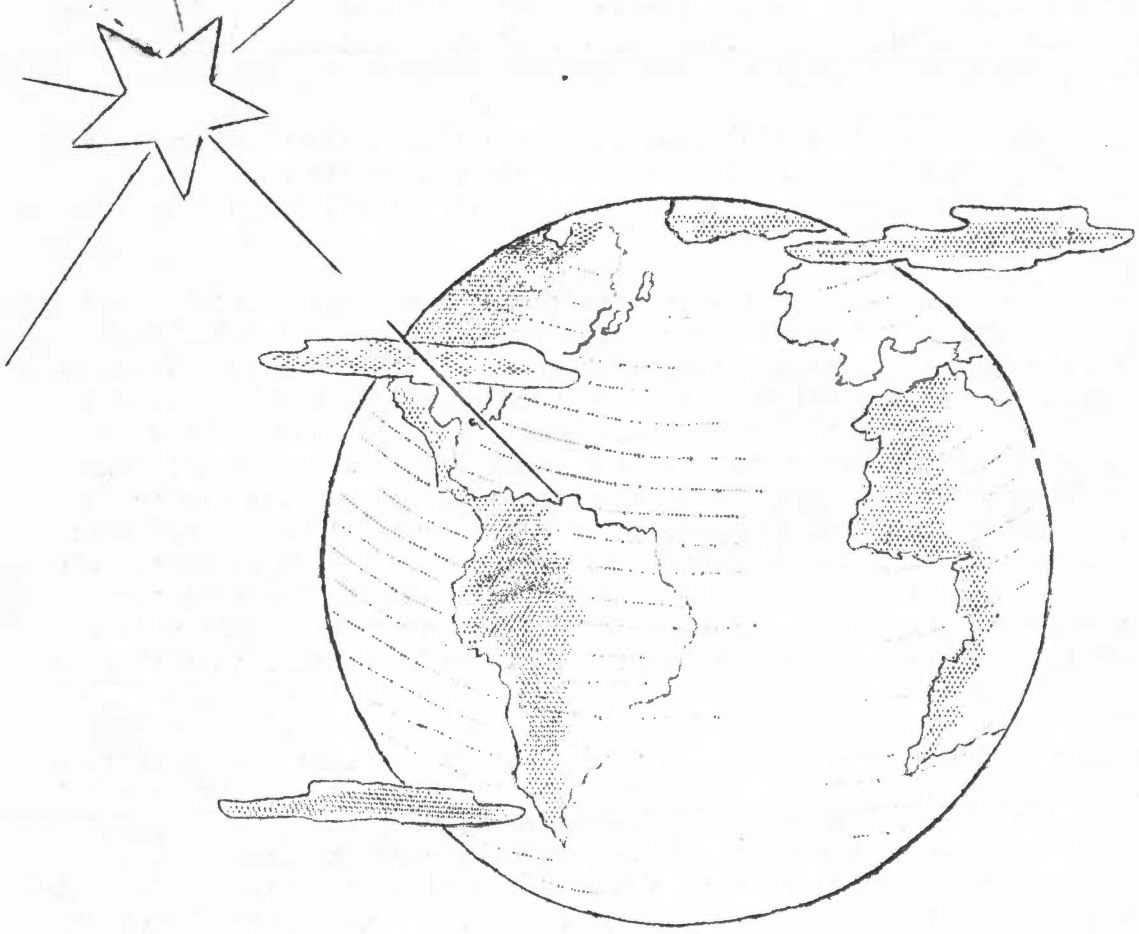
THE STROLLING ASTRONOMER

(Association of Lunar and Planetary Observers)



MAILING ADDRESS

THE STROLLING ASTRONOMER
Institute of Meteoritics
University of New Mexico
Albuquerque, N. M.

ENCLOSED PHOTOGRAPHS

With this issue of The Strolling Astronomer are enclosed two photographs.

One of them shows the telescope of Mr. J. Russell Smith, 320 Main Street, Eagle Pass, Texas. He writes of it:

"The instrument is an 8-inch Newtonian of 60 inches focal length. There is a heavy mount, which is cadmium plated, on a concrete pier. The telescope has circles and slow motions in both coordinates. An electric drive with a sidereal time ring is incorporated with the gear on the lower end of the polar axis. The finder has a coated lens 2 inches in diameter and 8 inches in focal length. The four bolts projecting from the top of the split-rings are for attaching various cameras."

We hope that other readers will send us pictures of their telescopes (and observatories) for distribution. The requirements are two in number: snapshots should fit into the envelopes employed for mailing The Strolling Astronomer, and about 90 of them should be supplied.

The second photograph sent out with this issue is a photographic reproduction of a map of Mars. Many readers will recognize it as the one published (not originally) in Popular Astronomy, Volume 49, pg. 32, 1941 (January). The map-makers are Flammarion and Antoniadi. We owe these prints to the generous aid of a subscriber, who prefers to remain anonymous. The small size of the prints was dictated by economic considerations. Nevertheless, they are legible enough, though a magnifier helps in bringing out the finest printing. The map is on Mercator's projection. As is customary, the map has south at the top and west at the right. Here west is named so that Mars rotates from west to east. Since the north pole of Mars will be tipped toward the earth during the next few months, features near the top of the map will not be observable. The white spots on some of the prints are not actual; our subscriber thinks that they are caused by over-age paper.

Our chief thought in distributing this map of Mars is that some members of A. L. P. O. will use it while the planet is close to the earth during the coming months. Studies of Mars are much more fascinating if one knows what objects have been seen and drawn. One needs, of course, to record the time of the observation and to employ it to compute the meridian of Martian longitude(numbered at top and bottom on print) central on the planet. It is necessary to remember that features near the edge of the spherical planet will be much foreshortened, just as on the moon.

Ideally, an observer should use not one map of Mars but several. Perhaps we shall say something in a later issue about some of the best existing maps of the planet. In the opinion of the editor, the enclosed Flammarion-Antoniadi map is probably the most usable map.

A final word of caution may be wise. Observers should draw what they see, not what is on any map. Mars is subject to changes, and it is impossible to predict future appearances.

THE ALTERED CRAPE RING

by Walter H. Haas

In the November issue of The Strolling Astronomer, I reported on a remarkable narrowing of the Crape Ring of Saturn, also known as Ring C. Additional data on this matter from a number of members of the Association of Lunar and Planetary Observers are now at hand. In view of the extraordinary nature of the change, it appears well to present this evidence in detail.

In Albuquerque, New Mexico, I continued to study Saturn with a 6-inch reflector from late October to late November. The width of the Ring C projection on the ball was regularly estimated near the C. M. as 1/2 to 2/3 that of Cassini's Division at the ansae. The best views revealed the greatest narrowness, as is to be expected for features actually very thin. On one occasion the width was estimated as only 1/3 to 1/4 that of the shadow of the rings on the ball, on the opposite side of the projection of Rings A and B. Off the ball at the ansae, Ring C was recorded as extending only 1/3 to 1/4 of the way from the inner edge of Ring B to the ball. According to published figures for the dimensions of the rings on pg. 385 of Volume I of Astronomy by Russell, Dugan, and Stewart, this ratio should be almost 2/3 ($\frac{12,500}{19,500}$). Other recent texts give similar values. I have found Ring C faint off the ball and have thought that it is perhaps more difficult to see there than in the past. The projection on the ball has looked as dark or darker than in 1946-7. The second possibility may confirm the first one; a less luminous Crape would look darker against the bright ball. There is no evidence for any changes in C since mid-September. Whatever happened to it was then completed.

E. J. Reese in Uniontown, Pennsylvania, has reported his observations of Ring C and its projection with a 6-inch reflector from September 12 to November 13. For the breadth of the projection near the C. M. he usually got 1/3 to 1/2 the width of the shadow of the rings, the better views tending to give smaller values. One estimate was "not more than half as wide as Cassini's Division at the ansae." Larger values were obtained for the projection's breadth at the limbs of Saturn, as the geometry of an ellipse requires. Several others confirm this difference. At the ansae Ring C was observed to extend from 1/3 to 4/10 of the way from the inner edge of Ring B to the ball. Mr. Reese wrote in part on November 14: "The present aspect of the projection of Ring C on the globe seems remarkable to me. Near the central meridian the projection is so narrow that it is almost invisible even in fair seeing! I can hardly believe my eyes! What is the explanation? Is the ring system subject to rapid change? Has a catastrophe occurred on Saturn? Do our eyes deceive us? Why haven't large observatories announced the change by this time? (Have they merely neglected to observe Saturn?--W. H. H.)

"I feel confident that the projection is now very much less conspicuous than it was on August 2, 1939, or last spring, even when allowance is made for the changing tilt of the rings to our line of sight. My recent views of Ring C at the ansae have been rather poor due to fog and haze. However, I feel that Ring C is dimmer and narrower than it was last spring -- but not as narrow as its projection seems to indicate!?"

E. K. White reports a good view of Saturn with a 7-inch reflector on October 25. At the ansae Ring C extended 3/10 of the way from the inner edge of Ring B to the Globe. He further noted: "The Crape projection on the ball is narrow; at the globe's center it is certainly narrower than is Cassini's Division at the ansae." He further reports that a drawing he made of Saturn on October 17, 1946, under similar conditions shows Ring C at the ansae extending in 3/10 of the way to the globe; however, the projection is there depicted about twice as wide as Cassini's at the ansae. This change in the width of the projection is considerably more than can be explained by the closing of the rings between the two observations.

E. E. Hare in Owensboro, Kentucky, has submitted a drawing made on October 21 in good seeing with a 7-inch reflector. The view was evidently a good one, for Encke's Division was visible. The breadth of the Ring C projection at the C. M. was called 2/3 that of the shadow of the rings. What chiefly impressed Mr. Hare, however, was a remarkable faintness of the ring off the ball; the brightest part had "only 1/2, perhaps 1/4, its intensity six months ago." The ring was fainter at one ansa than the other, Reese having found similar anomalies. Hare thought that the breadth of C at the ansae was about half the distance between the inner edge of B and the surface of Saturn. A later rough sketch on October 30 shows the projection substantially thinner and lighter than the shadow of the rings. Mr. Hare made these observations with no knowledge of what others had seen.

D. W. Rosebrugh, the well-known variable-star observer, examined Saturn under favorable conditions with a 6-inch refractor on October 22 and 28. On the earlier date he failed to see Ring C off the ball; but he did suspect a dark "line" bordering the south edge of the Ring B projection, "narrower and fainter than Cassini's Division at the ansae." This line evidently must have been the Ring C projection, and Mr. Rosebrugh's observation derives added significance from the fact that he did not clearly realize at the time exactly how Ring C should look. This error is pardonable enough; for many textbooks exaggerate the difficulty of seeing this ring with ordinary telescopes, and I have heard professional astronomers, on visiting nights, describe the Ring C projection as the shadow of the rings. On October 28 Mr. Rosebrugh quite failed to see Ring C either on or off the ball. This man, too, did not know what the others had been seeing when he observed.

J. R. Smith observed Saturn with an 8-inch reflector and <u>excellent</u> seeing on October 30. He saw no difference from the past but stresses that he had never before paid particular attention to Ring C.

Persevering in spite of a long series of cloudy mornings, A. W. Mount in Fort Worth, Texas, finally had clear skies and fairly good seeing on November 1. He employed an 8-inch reflector at 200X. He reports: "A careful inspection <u>failed</u> to reveal the expected projection of the 'C' Ring against the ball of the planet! However, details that are generally more difficult for me, such as bands on the planet, were plainly seen.

"I did observe what I believe to be the 'C' Ring in the ansae, most distinctly in the following end. It seemed quite ragged on the inner edge.

"I have observed the 'C' Ring many times in the past, both in the openings and, of course, across the planet. By these past standards of visibility the conditions of seeing on November 1, 1947, should have easily revealed the ring across the planet; but such was not the case."

C. Fernald in Wilton, Maine, writes that he saw Saturn "decently" on October 18. He opines from memory that the Crape Ring projection near the central meridian was about as wide as Cassini's at the ansae.

Finally, R. Missert in Kenmore, New York, has contributed a drawing of Saturn made with a 6-inch reflector on November 2. The Crape Ring projection was seen, narrow and faint. It width was estimated at 1/2 that of the shadow of the rings or even less. The drawing shows it to be, near the C. M., considerably narrower than Cassini's at the ansae. On November 2 Mr. Missert was quite unaware of what other observers had seen, nor had he ever studied Saturn before.

I thank all these observers for their efforts and reports. Their work very clearly establishes, in my opinion, that the inner portion of the old Ring C is now invisible. One could hardly ask for observations more concordant in evidencing a narrowing of this ring.

We may adopt for the present width of the Ring C projection at the C. M. 0.5 times the width of Cassini's at the ansae, on the basis of the preceding reports. Using $13^{\circ}.5$ as a mean numerical value of B, the Saturnicentric latitude of the earth, in September-November, it follows that the unforeshortened width of Ring C is 2.2 times that of Cassini's. Now before attempts were made to correct the measures for irradiation, the width of this gap was supposed to be near 2,000 miles. Since we have used rather small telescopes in our recent studies, it appears wise to employ this value. The present width of Ring C then comes out as 4,400 miles (hardly accurate to within less than 1000 miles). Lowell's measures several decades ago made its width then 11,500 miles; other past observers obtained 10,000 miles or slightly more.

The reports above suggest adopting 1/3 as the ratio of the distance from the inner edge of Ring B to the inner edge of Ring C to the distance from the inner edge of Ring B to the surface of Saturn. Again according to pg. 385 in Volume I of Astronomy by Russell, Dugan, and Stewart, the latter distance is 19,500 miles. The width of Ring C now comes out as 6,500 miles. This new value agrees but poorly with the one given by the projection. I prefer the first result, for Ring C contrasts but little with the dark sky.

Incidentally, our figures of 4,400 and 6,500 miles both include a narrow "fifth division" between Rings B and C, a gap perhaps 1000 miles wide. Lowell's 11,500 value does not include this gap. The present breadth is hence probably close to 4000 miles.

The evidence is fairly definite that Ring C is now fainter as well as narrower. If so, one must suppose that the inner half or so of the old ring has been destroyed somehow. Have the particles been precipitated upon the surface of the planet? If the inner particles were shifted outward, then the present Ring C would have to be denser and hence brighter than the former one.

What has here occurred? Did some external body upset the equilibrium of the system? F. O. Lane and E. J. Reese have suggested that perhaps a comet perturbed the innermost particles in the ring-system while Saturn was near its last conjunction with the sun. Reese points out that such a comet would go undetected for years, even if approaching the sun, because of its still great distance. The comet of our hypothesis must have approached very close to Saturn to produce such results. It appears curious that other aspects of the rings have been unaffected. Perhaps some of our readers have an explanation.

RECENT OBSERVATIONS

It is quite certain that Mars exhibited a brilliant north polar cap and an intense bordering dark north polar band from late October to late November. All observers agree on these matters. On October 25 and 27 Haas thought the north cap the most conspicuous that it had yet been this year. On November 10 he thought that the cap might be growing smaller. Since the vernal equinox of the northern hemisphere came on October 10, such a shrinking is to be expected as the surface cap melts. The north polar band may have been lightening in recent weeks. This change is another seasonal one occurring with the advance of the northern spring. On November 2 R. Missert remarked a greenish blue color in this band.

A south cap also is often visible. Missert on November 2 at C. M. 93° found it yellowish, fainter than the north cap and larger than it. E. K. White writes that on October 25, he saw "a rounded small dull yellow area at the south limb." E. E. Hare wrote on October 18 that the south cap had disappeared for him after August 17. However, he recovered a south cap on October 21; it was then brilliant and smaller than the north cap. On October 30 Hare drew a white and very small south cap. To Haas the south cap varied considerably in size and brightness during October and November; frequently it was invisible. The south cap under discussion is surely a cloud cap, not a surface feature.

Views of the canals, maria, etc. are still rather unsatisfactory because of the distance of the planet. White and Haas have found Hellas brilliant on the limb or terminator, so much so as to simulate a south cap. White saw Acidalium very plainly on October 25. In early November Hades canal looked less intense to Haas than it had a month previously.

In the following table we give the values of four physical quantities important to observers of Mars: D, the apparent angular diameter; $D_{\oplus}$, the areocentric latitude of the earth, positive when north; ⊙, the areocentric longitude of the sun, so measured as to be 0° at the vernal equinox of the northern hemisphere of Mars; and C. M., the meridian of longitude central on the disc. The data are given for 5 a.m. by E.S.T., 4 a.m. by C.S.T., 3 a.m. by M.S.T., and 2 a.m. by P.S.T. In interpolating to dates and times other than those given, it is useful to remember that C. M. increases at a rate of 14°.6 per hour.

DATE	D	$D_{\oplus}$	⊙	C. M.
1947, December 6	8".4	+20°.7	27°.2	283°
December 12	8 .8	+20 .8	29 .9	227
December 18	9..3	+20 .9	32 .6	170
December 24	9 .8	+20 .9	35 .3	115
December 30	10 .3	+20 .8	38 .0	59

Observations of Ring C of Saturn are discussed elsewhere in this issue.

The chief belt on the ball of Saturn continues to be a doubled South Equatorial Belt. The components require fairly good definition to be divided. The Equatorial Zone between this belt and the Ring C projection continues to be the brightest part of the ball, though Haas in November considered it distinctly duller than last spring. The ball is dull south of the South Equatorial Belt, and sometimes a faint and diffuse South Polar Band is seen near the limb. The ball north of the rings is rather bright. Hare, Reese, White, and Haas have all observed a narrow, and hence delicate, North Temperate Belt about midway between the shadow of the rings and the north limb. Hare on October 30 placed it nearer to the north limb. Encke's Division in the rings has been seen by Hare and White, and Haas has suspected it. Hare noted on October 21 what may be an exacting test of optical quality for telescopes of ordinary apertures: the phase of Saturn was visible in that the terminator was less bright than the limb.

Haas examined Uranus with his 6-inch reflector on a number of October and November dates. The appearance was not the same as in early August (pg. 4 of September Strolling Astronomer). Instead, the easiest Uranian feature was now a dark band near the north limb of the small disc. Perhaps some of our readers would like to try their luck with Uranus. This brief ephemeris may be helpful:

Date (U. T.)	Right Ascension	Declination
1947, December 5	$5^h\ 36^m.6$	$+23^\circ\ 29'$
December 13	5 35 .2	+23 28
December 21	5 33 .7	+23 27
December 29	5 32 .2	+23 27

Not far from Uranus is the third magnitude star Zeta Tauri, with coordinates $5^h34^m.5$ and $+21^\circ7'$.

M. Williams in Santa Monica, California, has been displaying remarkable energy in systematic searches for lunar meteoritic phenomena, either meteors or impact-flares. He has in recent weeks spent 17 hours in such searches with an 8-inch reflector. As yet, Mr. Williams has seen nothing unusual, no moving lunar specks and no stationary flashes. His practice is to observe a small area near the moon's terminator and the adjacent non-sunlit region. The editor thinks that it is better to keep the sunlit moon entirely out of the field of view and to examine the dim earthshine instead. One should have as faint a background as possible when looking for luminous phenomena some 240,000 miles away. The editor also thinks that searches for these appearances have little chance of success unless conducted before First Quarter and after Last Quarter. Mr. Williams says of his preference for the terminator regions that he should be fascinated to see a new crater formed there by an impinging meteorite!

E. E. Hare writes that on October 24 he had a good view of the delicate cleft in the southwest part of the floor of the lunar crater Conon. E. J. Reese and E. K. White have also observed it. The best evenings to look for the cleft during the coming month will be those of December 21 and 22 (civil time dates).

Hare also writes that he observed Linné on October 23; it was then about two days within the sunrise terminator. Inside the familiar white area was a small crater, and in this crater Hare observed a black shadow. This crater has been seen by a number of other members of A. L. P. O.; a doubtless incomplete list of observers and instruments might be: F. R. Vaughn (7-inch reflector, 18-inch refractor, 8-inch refractor); H. M. Johnson (8-inch refractor); E. K. White (9-inch reflector); C. M. Cyrus (10-inch reflector); E. J. Reese (6-inch reflector); A. W. Mount (8-inch reflector); and W. H. Haas (18-in refractor, 6-inch reflector, and 4-inch refractor). Nevertheless, the crater is a delicate object. The present object would certainly have escaped the pre-1866 views of Maedler, Lohrmann, Schmidt, and others; still less could they have measured its diameter to be as much as seven miles. The best evenings to examine Linné critically during the coming month will be those of December 19 and 20 (civil time dates).

NEW NAMES?

Fellow Members of the A. L. P. O.:

Should we refer to ourselves as "lunarians" and "planetarians" instead of using the more cumbersome terms "lunar observers" and "planetary observers"?

Those of us who observe the moon are clearly entitled to the first title. Webster's International Dictionary, 1944, gives as the second definition of lunarian: "(b) a student of the moon, formerly one who ascertained longitude by observing the moon."

Planetarian is defined as: "1. An astrologer (obsolete). 2. An inhabitant of a planet (rare)." I propose we give it a third and modern meaning: "A student of planets and their satellites."

What about it, fellow lunarians and planetarians?

(signed) Planetarian, D. W. Rosebrugh

THIS AND THAT

On pages 4 and 5 of our October issue we described a "brilliant flash" on the floor of the lunar crater Plato observed by Mr. Francis H. Thornton. We have now received a letter from Mr. Thornton. In response to the editor's question about the stellar magnitude of the flash, which he had compared to an ack-ack shell-burst ten miles away, our confrère estimates that it was as bright as a fourth magnitude star. Perhaps Mr. Thornton had in mind such a star seen on a clear and dark sky. The editor rather doubts that a star of this brightness could appear "brilliant" against a near-full-moon background in a 9-inch telescope. At any rate, Mr. Thornton's flash in Plato now appears more comparable to Mr. A. W. Mount's similar object.

Mr. Hugh M. Johnson, 1108 East 65th Street, Chicago 37, Illinois, in criticizing magnitude estimates of moving lunar specks and stationary flashes seen upon the moon, urges an instrumental approach to this problem: "With one eye at the eyepiece observing the moon, let there by reflected into the other eye light from various other point sources in dark fields. The magnitudes of these sources must be known; but they need not be celestial if the magnitudes of distant land lights can be determined, as through Argelander's step-method from celestial sources. Let the eyes be adjusted so as to fuse the point image in one eye over against the moon surface image in the other. The actual appearance of a star of given magnitude seen against the moon will then be arrived at. Certain techniques will be necessary. For example, although the two pupils are normally always equal in size . . . . visual purple would not form equally on the two retinae so that the eyes would have to be repeatedly alternated at the eyepiece until a fairly equal and stable sensitivity had been achieved, i.e., both eyes would have to be 'moon-blind', and equally."

The suggested instrumental project appears important to us. We should be very glad to hear from anyone who would like to carry out Mr. Johnson's suggestions.

We have been asked to print the following note:

"An artificial disk-drawing experiment is being carried out, by means of which it is hoped to learn more about subjective errors in drawing planetary and lunar objects. Considerable data are now on hand; but more are desirable, espicially from observers who have had some experience with the moon and the planets. Instructions are enclosed with each set of objects to be drawn. These may be applied for from:

Frank R. Vaughn
934 W. Gunnison
Chicago, Illinois."

The editor wishes heartily to second Mr. Vaughn's request. In interpreting drawings, it is very important to know as exactly as possible what subjective errors to look for. For example, is a bright limb often shown on drawings of Venus real and due to the planet's atmosphere, or is it a contrast illusion due to the differing brightness of the planet and the sky?

Active observers who have not yet done so should order their 1948 American Ephemeris and Nautical Almanac now. The price is two dollars; and the book is sold by the Superintendent of Documents, Washington 25, D. C.

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S T A F F

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