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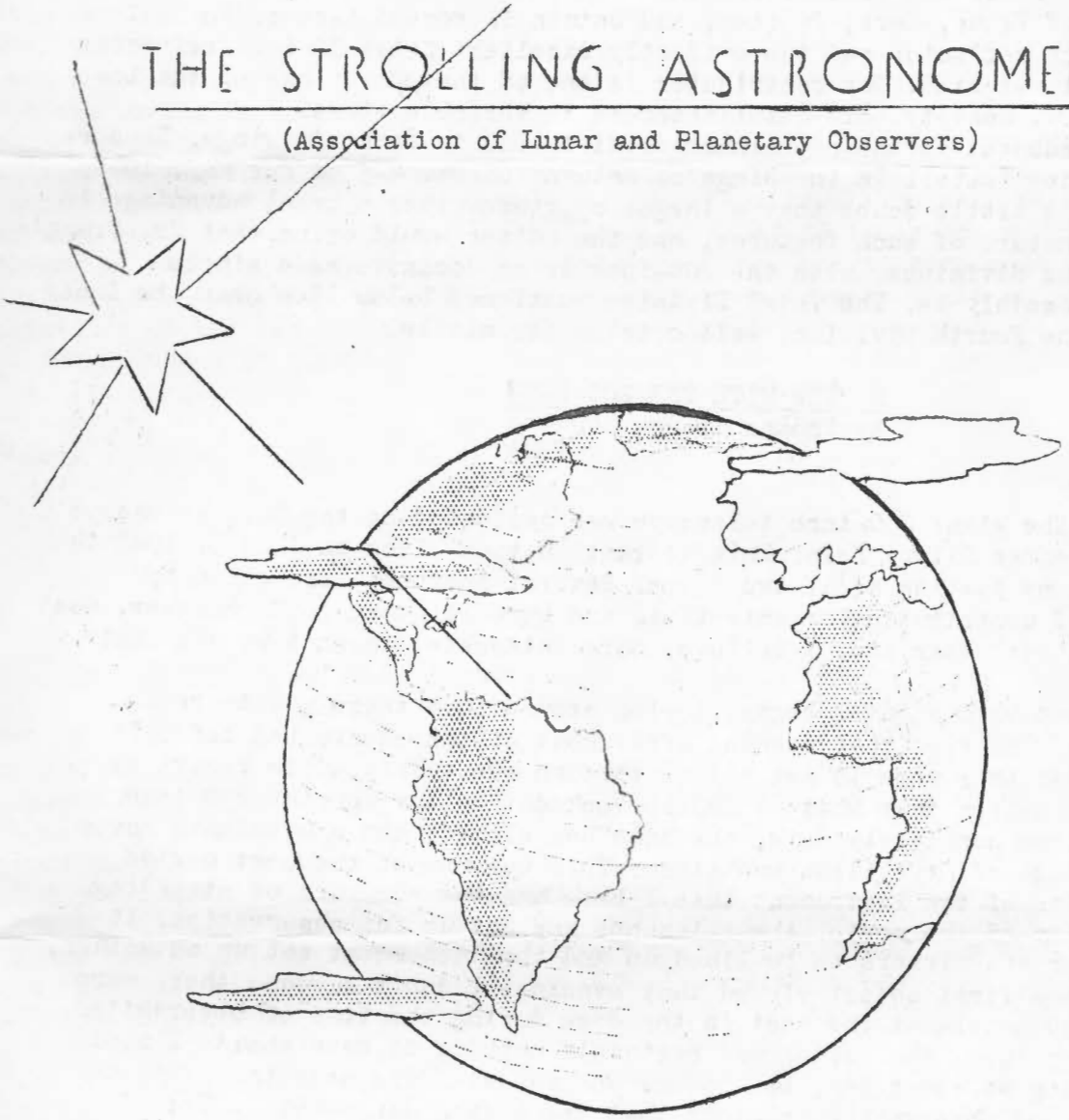

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INTRODUCTION

Though all of us would have liked to attend the dedication of the Palomar Mountain 200-inch reflector in June, very few of us did so. Though all of us may wonder what planets look like in the 200-inch reflector, very few of us will ever see them thus. However, Mr. Thomas Cragg, 1908 S. Burlington Ave., Los Angeles 7, California, has had both experiences. He has described them in the following article, which we are very happy to publish.

Mr. Cragg is one of our most active observers. We have frequently described his observations of Venus, Mars, Jupiter, and Saturn in recent issues. He employs both his own 6-inch reflector and the evidently excellent Zeiss 12-inch refractor at the Griffith Planetarium. Our contributor is one of the sparkplugs of the Los Angeles Astronomical Society. His chief interest is variable stars.

Mr. Cragg's subject is the appearance of divisions in Saturn's rings. Readers might like to review "Detail in the Rings of Saturn" on pp. 4-5 of our May, 1948, issue. There can be little doubt that a large aperture gives a great advantage in telling the real nature of such features, and the editor would opine that Mr. Cragg's view of the various divisions, with the 200-inch is as decisive as a single observation can possibly be. The Third Division mentioned below lies near the inner edge of Ring B; the Fourth Division, well outside its middle.

SATURN WITH THE 200-INCH

by Thomas Cragg

As we know, the giant 200-inch telescope was dedicated as the Hale Telescope in honor of Dr. George Ellery Hale. This dedication took place on June 3, 1948 in a very fine ceremony lasting about two hours. Several speeches were given by various members of contributing organizations and were all very good. However, most of the readers of our paper are, I believe, more interested in what we did that evening.

It all started when a rumor began flowing around that there was to be a "Press Conference" later on that evening after most of the people had left. It was understood that they were to get a look through the telescope to report to the public of the nation just what an object looked like through the 200-inch. Before it had become completely dark, the dome was closed; and a 45-minute movie taken by Edison Hoge of Mt. Wilson was given. This was one of the best movies on the construction of the instrument that I have had the pleasure of attending. Upon the conclusion of the movie, the telescope was set up for observation. It took some time for the mirrors to be lined up and the instrument set up on Saturn, which was to be the first object viewed that evening. I don't suppose there were more than 40 or 50 people at the most in the dome during the time of observation. Of course, with my luck, the seeing was certainly nothing to rave about. I would estimate the seeing at about 2* ; Dr. Bowen, who was standing near the eyepiece during the course of observation, claimed that the seeing was about 1. When I placed my eye at the coudé focus of the telescope, the first thing that impressed me was that the object was so brilliant that finer details were obscured on the ball itself. Especially true when working with planetary detail is the interesting effect that occaisionally, when looking with bad seeing, the seeing will steady down for a moment and permit details to be observed quite well. Such was the case now. The first thing I thought of was to find out what the rings were like, as I knew that with smaller telescopes the seeing would have to be excellent in order to see anything at all. When the sudden steady moment did occur, the following could be said to have come out: 1) Encke's Division was resolved as a band of definite width but was distinctly a band and not a complete space gap void;

2) Cassini's Division was the space gap division it is usually contended to be and was easily visible around the entire visible part of the ring; 3) the Third Division came out, very thin, but to me it appeared definitely to be a black line or a space gap rather than a band as has been described by most of the A.L.P.O.; 4) the Fourth Division was also seen and was just a mere trifle thinner than the Third Division, but was also a space gap rather than a darkening. During one observation with a twelve-inch Zeiss refractor, Mr. Tome Cave of Long Beach, Calif. and I were under the impression that the Third Division was really two very narrow thin streaks, but this observation with the 200-inch seems to confirm what was originally thought by members of the A.L.P.O. (a single division); 5) The Crape Ring was definitely visible around the entire visible part of the ring, but the division which has been observed in this ring was not found by me with the 200-inch that evening; 6) the space gap between the Crape Ring and Ring B was also not visible during this observation. The alarming thing that struck the author besides the extreme brilliancy of the ball were three satellites which were in the field of view at the time. They were of about 10th magnitude, and through the big telescope they looked about like third magnitude stars in a six-inch telescope. By this time it was the next person's turn in line so I had to leave the eyepiece. I was trying to wait for another good spot in the seeing, but no more came along. This observation, I believe, should certainly give considerable light on the disputed existence of the two divisions many of the A.L.P.O have observed. During the course of the observation a seven-inch focus negative telescope was used for an eyepiece (so I understand) giving a power of around 700x.

*On a scale of 0 to 10, with 10 best.

VENUS PASSES THE SUN

by Walter H. Haas

It is well known that the horns of the planet Venus extend considerably beyond a semicircle near inferior conjunction, partly merely because the sun is larger than the planet but chiefly because the sunlight is diffusely reflected in the atmosphere of the planet. The appearance is often ascribed to refraction; however, H.N. Russell has shown in Ap.J., Volume 9, pg. 284, 1899, that it must be imputed to reflection, though refraction can explain the luminous ring around Venus during its rare solar transits. The purpose of this article is to summarize some observations made near the inferior conjunction on June 24, 1948. We limit attention to ones made when the phase-angle i was at least 160°. This i is the angle at the center of Venus between lines drawn to the centers of the earth and of the sun. The participating observers are: W.H. Haas with a 6-inch reflector in Albuquerque, New Mexico; D. O'Toole with a 3.5-inch reflector in Vallejo, California E.J. Reese with a 6-inch reflector in Union town, Penna.; C.B. Stephenson with the University of Chicago 6-inch refractor; and E.K. White with a 7-inch reflector in Kimberley, B.C., Canada. Powers employed ranged from 50X to 200X; low ones were most effective on the brilliant sky near the sun. We list below observed angular perimeters p of the bright limb.

No.	Date(U.T.)	Observer	i	p
1	1948 June 15.1	Haas	159°7	220°
2	June 16.1	Haas	161.7	235
3	June 16.9	Stephenson	163.4	190
4	June 18.1	Haas	165.9	230
5	June 19.1	Haas	167.9	240
6	June 20.7	White	171.2	236
7	June 21.0	O'Toole	171.8	200
8	June 21.8	O'Toole	173.4	200
9	June 24.6	Reese	176.6	360

No.	Date (U.T.)	Observer	i	p
10	June 26.0	White	175°2	180°
11	June 26.9	White	173.4	360
12	June 27.7	White	171.8	230
13	June 27.7	Reese	171.8	213
14	June 30.7	Stephenson	165.7	360
15	July 1.9	White	163.2	200

Some comments on these observations may be worthwhile. Haas found the ends of the horns so thin and dim that it was difficult to estimate the perimeter. He thinks that his values must be regarded as minimum ones and that a larger telescope or a darker sky would have supplied greater perimeters. The same point is stressed in the fact that O'Toole's 3.5-inch gave smaller perimeters than the larger apertures. Reese's observation on June 24 was at the very hour of conjunction with the sun. He clearly saw the planet as a complete ring of light, but the south half of the ring was indeed faint. The "conspicuous" portion of the ring had a perimeter of 212° and remained easily visible when thin cirrus clouds passed in front of Venus. The brightness of the ring did not diminish uniformly from its thickest part to the opposite point; instead, some alternate brighter and dimmer arcs presumably indicated inequalities in the Venusian atmosphere. White's first observation of June 26 was in a slightly hazy sky, which doubtless explains his negative result. In his second view on June 26 he saw the complete ring during the best moments. Stephenson's seeing Venus as a complete ring on June 30 is very interesting because this feat is usually thought impossible with i only 166°. It hence appears well to give some details. He writes that he was barely able to make out the complete ring of light but that there is no doubt in his own mind of its reality. There were many fair-weather cumulus clouds, which obligingly covered the sun without obscuring the planet from time to time. The sky between the clouds was very clear, remarkably so for Chicago. Stephenson thought that the faintest portion of the ring was perhaps not exactly opposite the sun. Reese on June 24 saw three dimmest arcs, none centered exactly opposite the sun. Later on June 30 H.M. Johnson joined Stephenson at the Observatory. The sky, alas, was now almost clear of clouds and less transparent than earlier, and neither of them could even suspect the ring.

Let us inquire about the height h of the diffusely reflecting layer of Venusian atmosphere. Let $l = \frac{1}{2}(p - 180°)$, where p is the perimeter. When i is 90°, it is easy to show that $h = R(\sec \varphi - 1)$, where R is the radius of Venus or 3850 miles and φ is the atmosphere-caused component of l. More generally, it can be shown from spherical trigonometry that at any phase one has approximately: $\sin(\varphi + 0°.22') = \sin i \sin l$. Here 0°.22' is the angular radius of the sun as seen from Venus. If φ is fixed, it is evident that l will increase as i increases from dichotomy to inferior conjunction and that l will reach 90°, making p equal to 360°, when i is close enough to 180°. The observations listed above may be then reduced as follows:

No.	φ	No.	φ
1	6°.4	8	0°.7
2	7.9	9	3.0 or more
3	1.0	11	6.2 or more
4	5.5	12	3.0
5	5.6	13	2.0
6	3.7	14	13.9 or more
7	1.0	15	2.5

The average of the 14 determinations is 4°.5 or more. If one omits number 14, the average is 3°.7(or more). But in view of the huge variations in φ and some of the remarks given above, it appears likely that the smaller values of φ represent only the brightest part of the extensions. I should opine that the actual value of

φ is between 5 and 7 degrees. The depth h of the diffusely reflecting layer is unfortunately sensitive to small changes in φ because of the secant function in the formula. One has these corresponding values.

φ	h
4°	9.2 miles
5	14.6
6	21.2
7	28.9
8	37.7

Some of the observers reported the dark hemisphere of Venus to be darker than the adjacent sky. Such was its appearance to C.Tombe on June 23 "in a perfectly clear sky" and to Reese on June 24. Stephenson on June 16, and F.M. Johnson and W. Lorenz with him, also found the dark part of Venus slightly darker than the sky. On June 30 Stephenson and Johnson again usually thought the dark hemisphere darker than the sky, but on this date they also sometimes saw a difference in the opposite sense; and Stephenson, reporting for them, stresses the psychological effects involved in the observation. White and Haas remarked no definite difference between the interior of the crescent and the sky.

Now this curious darkness of the interior of Venus had been reported by some other observers near past inferior conjunctions. It has been suggested that the appearance is caused by a faint extension of the solar corona, dimming with increasing distance from the sun. Since Venus occults such coronal light, it would then be dimmer than the sky. Stephenson and Johnson have sought to check this interpretation by comparing the dark hemisphere of the nearly new moon to the adjacent sky during daylight or bright twilight. The two regions have appeared to be much the same intensity under these conditions, perhaps because the coronal illumination of the sky is balanced by the earthshine on the moon, perhaps only because of obvious observational difficulties. Again, the moon can scarcely be observed as close to the sun as Venus often is near inferior conjunction; and the supposed outer solar corona must be correspondingly dimmer near the moon.

It is tempting to wonder whether Stephenson's huge value of φ on June 30 may represent a temporary elevation of Venusian gases, as he himself suggests as possible. Observations 12,13 and 15 quite fail to evidence such abnormal elevation on June 27 or July 1; in fact, they suggest that φ was less than average on those dates, though they were made under unusually good conditions. But maybe it is the amateur's privilege - and duty! - to speculate.

It may be worthwhile to mention in conclusion the well-known Lowell Observatory photographs of Venus on November 20 and 22, 1938, first published in The Sky, Volume 3, No. 5, pg. 3, 1939. The earlier one shows the planet as a complete ring of light with i near 175°.9, and the other shows both horns prolonged, the south much more so, with i near 175°. The twilight illumination of the horns was four times stronger in blue light than in red, but a cloud mass 700 miles long near the south cusp was reddish in color. No measurable difference in brightness was found between the night hemisphere of Venus and the sky. Measures of the diameter of Venus on the photographs gave 7610 miles in red light, 7628 in green, and 7637 in blue. The difference might indicate an atmosphere 27 miles deep, but the Lowell observers thought it more likely that accidental errors in the measurements are involved.

OF PLANETS AND MEN

Important Note. All dates and times in this pamphlet are given by Universal Time unless the contrary is explicityly stated. Universal Time is the local mean solar time at Greenwich. The U.T. date will frequently differ from the date by civil time such as E.S.T., P.D.S.T., etc.

We do not often get observational reports on Mercury. We were hence glad to receive a précis of observations by C.B. Stephenson with a 6-inch refractor on May 18, May 20, June 1, June 4, and June 8 and a drawing by T. Cragg with a six-inch reflector on May 18. Stephenson writes that at 18^h30^m on May 18 (at 12:30 P.M. bby C.S.T. at Chicago) he found the terminator of Mercury to be either exactly straight or else very slightly concave. The best views gave an "exquisitely sharp" disc and showed concavity. W. Lorenz, observing with Stephenson, "pronounced the disc definitely not gibbous, the terminator appearing perfectly straight to him." The interesting thing about this observation is that it was made when the phase angle i was only 76°; theoretical dichotomy did not arrive until i reached 90° on May 23. Other observers frequently have recorded such differences between theoretical and observed dichotomy for Mercury, though usually smaller in amount than here. Similar differences for Venus are imputed to its atmosphere, and one thus appears justified in supposing a Mercurian envelope involved for that planet. Alternately, it has been pointed out that the terminator of Mercury is less brightly lit than the rest of the disc and might hence be invisible, causing the observed phase to be too small. Although familiar with this explanation, Stephenson thinks it unlikely because of the sharpness of the disc during the best moments. At any rate, it is easy to verify that poor telescopes, bad seeing, and generally inadequate views make the phase seem too large, not too small. When i was 80° on May 20, Stephenson again remarked slight concavity. Cragg drew a convex terminator at 3^h15^m on May 18, with seeing bad.

Stephenson's drawings show several dark areas near the terminator, and these appear to coincide with the areas named Atlantis, Criophori, and Aphrodites by Antoniadi. His map of Mercury is reproduced on pg. 193 of F.L. Whipple's Earth, Moon, and Planets. Stephenson's drawings show Atlantis, the southernmost of the three shadings, present on June 1, but absent on June 4 and 8, unless drawn joined to Criphori on the later dates. Sketches of Mercury by W.H. Haas with a 6-inch reflector appear to show Atlantis on May 23 but not on June 6 or 8. Haas also drew, on most of the dates that he observed in May and June, bright cusp-caps and bordering dark cusp-bands.

Stephenson remarks that with a 6-inch refractor in Chicago he got his best views of Mercury just after sunset and before the planet was visible to the naked eye. This experience accords with that of many others who have studied the Elusive Planet with small apertures. Setting circles are a great aid in locating the planet, of course, though an ingenious amateur will be able to pick it up without them.

Observations of Venus near the June 24 inferior conjundtion are described elsewhere in this issue. We have received a set of drawings madein May and June by L.T. Johnson with an 8-inch reflector and another set by T. Cragg with an 8-inch reflector. The industrious Mr. Cragg obtained 32 drawings of Venus from December 22, 1947 to June 11, 1948.

Johnson observed bright spots near each of the two cusps, though these are not shown centered upon the cusps. He also depicted rather indefinite shaded areas near the terminator. On May 9 the terminator looked ragged to him, and on May 24 he saw "some curves in it"; these may correspond to the terminator-irregularities observed by Pfannenschmidt, Bartlett, and Slemaker in May (see July issue).

On June 10 and 11 Cragg found the horns to extend through definitely more than a semicircle. That is not in itself remarkable with phase-angles of 150° on June 10 and 152° on June 11; indeed, Haas estimated the angular perimeter to be 195° already on June 8. The interesting thing rather is that Cragg observed two bulges on the very thin horns beyond (i.e., on the dark limb side of) the theoretical cusps. He suggests that these are cloud-masses near the Venusian poles. There is certainly a remarkable resemblance to the cloud-mass photographed on the twilight arc near the south cusp by the Lowell Observatory on November 22, 1938 (The Sky, Volume 3, No. 5, pg. 3, 1939.)

Cragg has several times drawn a large white protrusion from the north

cusp-cap. If the cusps are at the poles, perhaps one has here the equator-ward flow of polar cloud-masses. The bulges near the cusps on June 10 and 11 mentioned above perhaps favor the idea that the bright cusp-caps drawn by so many observers are polar clouds higher than the general reflecting surface of Venus. Cragg has, moreover, several times remarked one or more small detached bright spots near the south cusp-cap, curiously like the "Mountains of Mitchell" on Mars. On May 25 a very brilliant spot near the south cusp appeared to project beyond the limb of the planet, presumably mostly or wholly because of irradiation. Cragg has not found it possible to obtain any clear ideas about the Venusian rotation from an examination of his drawings - in which respect he has many eminent predecessors!

The "ashy light", that curious and controversial illumination of the dark hemisphere of Venus, is still with us planetarians. On April 17 and 23 J.C. Bartlett with a 3.5 inch reflector observed this dark hemisphere, which exhibited a purplish gray color. He saw it for the third time on May 9; but it was now changed considerably in color and appearance, being "something darker than the sky between the horns of the crescent," to borrow Mr. Heath's expression. Dr. Bartlett writes that the "ashy light" was invisible on other dates that he studied Venus, or at least much fainter than on the three dates mentioned. After years of seeing the dark hemisphere to be exactly like the sky, W.H. Haas on June 6 with a 6-inch reflector perceived the "ashy light" for the first time, very faint and possibly red-brown in color. It much reminded him of the lunar earthshine (a comparison often made), even to the extent that the dark limb looked brighter than the interior portions of the dark hemisphere. Haas repeated this observation on June 8, though the "ashy light" had perhaps grown dimmer. He failed to see it on June 15 or 16, suspected it strongly on June 18, and found it faintly present on June 19. When visible to him, it looked brownish.

Venus will be extremely well placed in the morning sky during the next several months. We urge our readers to watch it under these favorable conditions. One cannot complain of a lack of Venusian puzzles!

Just about everyone has stopped looking at Mars. On June 13, at ☌ 111°, E.K. White in his 7-inch reflector found the north cap still conspicuous, much more so than the south cap. On July 12 at ☌125° and on July 17 at ☌ 128° Haas found the south cap larger and brighter than the north cap. The latter, in fact, looked inconspicuous and no longer brilliant, though certain judging was difficult with Mars so remote. Is the melted remnant of the surface snow now covered by atmospheric mists?

E. Pfannenschmidt has kindly communicated a set of 10 Mars drawings by Meyer and Winterberg with the Stuttgart, Germany, Merz 8-inch refractor between April 19 and May 25, inclusive. These drawings show the north cap apparently about constant in size while ☌ ranged from 87° to 103° so that melting may have ended by April 19. The south cap was usually not observed. However, on April 27, at C.M. 239° there was a very bright area near the south pole. It was probably reobserved on April 28 at C.M. 244° as a south polar bright area without definite borders. Of the April 27 view Meyer said".....the northern part of the disc was very hazy and of a clear reddish hue. Every detail seemed to lie under a half-transparent mist." The "Libya gap" in Syrtis Major was beautifully seen on April 20. On April 28 several canals were resolved into chains of dots. On April 26 both Meyer and Winterberg drew Mars near C.M. 264°. Though they agree remarkably well, neither of them shows Syrtis Major with at all its usual size and prominence. That obscuring Martian atmosphere again?

Saturn will be unobservable in August; but we hope that our members will study it as soon as possible after conjunction, being expecially attentive to the intensity of Ring B and to the exact appearance of Ring C both on and off the ball. In his last view of the 1947-48 apparition on July 12, necessarily a poor one, Haas found Ring B still dimmer than the Equatorial Zone and the C projection at the C.M. about as wide as Cassini's at the ansae. E.E. Hare writes that in late May and up to June 21 the narrow outer part of Ring B grew somewhat brighter, Ring C simul-

taneously became as dim as in October, 1947, he says. E.J. Reese has reported a third observation of the shadow of Ring B within the Ring C projection. On May11 he saw this projection to be black in its northern two-thirds, lighter in its southern third. The Equatorial Band was then clearly visible slightly south of the middle of theEquatorial Zone. We have recently received welcome drawings of Saturn from L.T. Johnson and T. Cragg. Johnson speaks of the Crape Ring projection as "very narrow" on November 29, 1947, just as others in A.L.P.O. were then seeing it. He shares also the opinion that this projection was extremely dark on (and near) May 9, 1948; in fact, he thought it to be a shadow. On May 11 he made the Equatorial Zone the brightest part of the ball and rings and thus brighter than Ring B - a third welcome bit of confirmatory evidence in his report. Cragg's drawings on May 18 and 25 show the south polar white spot very small, much smaller than he drew it in April. He finds two belts north of the rings and a very thin and sinuous Equatorial Band. On each date Cragg drew a white area on the preceding limb (left in simply inverted view) in high southern latitudes. It appears to be like the Saturnian limb areas observed by Reese and Haas in 1947-48 and thought to be longitudinally extended clouds above the visible surface of the planet. Cragg found no hint of any projecting of this area at the limb. We spoke in our last couple issues about a lighening of the South Polar Belt during May. We here add that Cragg drew this belt on May 18 but showed no sign of it on May 25 in a view obviously not poorer than usual.

Recent observers of Jupiter include (Miss) A.I. Hough, T. Cragg, T.R. Cave, J.C. Bartlett, R. Missert, E.J. Reese, E.E. Hare, E.K. White, Gerstenberger (at Stuttgart), L.T. Johnson, J.R. Smith, and W.H. Haas. The planet will continue to be well placed, though low in the south, during August.

The Red Spot Hollow continues to be seen as a white oval brighter than adjacent portions of the South Tropical Zone and outlined at each end by a dark band across the zone. It shows its usual deflecting effect upon the south part of the South Equatorial Belt. The Red Spot itself remains quite invisible. However, Cave in a splendid view on June 15 saw some faint dark markings inside the Hollow. Hare on June 23 found the thin and faint belt within the South Tropical Zone to cross the Hollow without a change in direction, and a poorer view by Haas on July 10 shows much the same appearance. There is some evidence that the Hollow has become dimmer than it was some months ago. Though Reese had found it unusually bright on April 26 (as Haas did on April 27), it looked much duller to him during June. On July 5 Missert thought the Hollow about the same brightness as the South Tropical Zone. Haas thought the Hollow rather inconspicuous on June 17, 18, and 22; on July 10 he found it scarcely brighter than the zone, and on July 14 it looked dimmer than in May. Transits by Reese gave these longitudes (II) for the Hollow from May 20 to June 28: preceding end at 220° (9 transits), center at 232° (8 transits), following end at 244° (9 transits). Haas got these values from July 10 to July 17: preceding end at 218° (2 transits), center at 231°(4 transits), following end at 242° (4 transits). Missert on July 5 put the center at 237° and the following end at 243°, but he opines that these values may not be too reliable. White placed the following end at 243° on June 30. J.A. Smith put the center at 234° on July 9 and 14. It now appears rather clear that the Hollow is moving slowly in increasing longitude (II).

The general appearance of the belts and zones is still the same as described on pg. 4 of the July issue. The South Equatorial Belt is still weakest near the Hollow and is very prominent in the opposite longitudes. The south component of the South Equatorial Belt North (of the whole South Equatorial Belt?) has often been much stronger than the north component. In mid-July Haas found the South Tropical Zone rather dull near the Hollow and distinctly brighter in other longitudes. A lovely drawing by Reese on June 18 at C.M. (II) 213° shows a thin belt in the North Tropical Zone, just as Hare observed on May 23.L.. T. Johnson on June 14 saw a short rather dark section of the Equatorial Band a little short of central at C.M. (I) 325°, and Haas on June 13 placedthe following end of this darker section at 330° (I). Unfortunately, these isolated statements can convey little idea of the complex and ever-changing pattern of the Jovian belts and zones.

Reese has called to our attention what may well have been a truly remarkable and significant drift. On June 24 a narrow black streak on the south edge of the North Equatorial Belt extended from longitude (I) 98° to 126°. On June 29 the same streak, at least to all appearances, reached from 113° to 142°. Reese at once observed that the streak was thus approaching a large dark projection on the south edge of the belt, observed to lie at 154° on June 24 and 152° on June 29. Cloudy skies now promptly descended on our observer, but in poor seeing on July 1 he thought both streak and projection less conspicuous than on June 29. Transits on July 1 placed the preceding end of the steak at 118° (I); the following end was not distinguished from the projection, now at 150°. We thus find that the preceding end, and perhaps both ends, moved 20 degrees in increasing longitude (I) in only seven days Hence, if we have not blundered in identification, the streak had the abnormal rotation-period of 9^h52^m 4The editor conjectures - or rather guesses - that such periods differing greatly from those usually assigned for the various latitudinal currents may not be too rare, especially if such crassly individualistic marks do not endure beyond the quickly inevitable collisions with their normally-moving fellows. A short-lived mark will simply not be observed often enough to allow its period to be determined.

Usually the extreme limb of Jupiter looks dim and featureless, and it is hence noteworthy that Cragg has not only seen some bright spots on the limb but has even had impressions of projections there. The first example of seeming projecting was a spot on the following (right) limb in the South Tropical Zone on June 15 at C.M. (II) 245°. The second one lay in the South Temperate Zone on the following limb at C.M. (II) 210° on June 20. Cragg opines that the projecting effect was mostly due to irradiation. The editor rather doubts that any of it can be actual. The polar radius of Jupiter was 22" in June, and it follows that a cloud projecting only 0".1 must rise nearly 400 miles above the reflecting surface of the planet. But since the surface gravity on Jupiter is 2.6 times that on the earth, the density gradient in the former's atmosphere must to steep; and it appears difficult to suppose that Jovian clouds can attain heights so very far above what terrestrial ones reach.

It may be worth mentioning that Haas observed a brighter area near the preceding (left) limb in the Equatorial Zone on July 10 at C.M. (I) 140° to 146° (watched for ten minutes). He was much reminded of Martian and Saturnian limb spots. This Jovian feature was about 2" or 3" long north-south and was much less wide than long, perhaps because foreshortened.

Messrs. Cragg and Cave had a festive time drawing detail on the Galilean satellites on June 13 with the Griffith 12-inch refractor at 833X. Both observers saw white caps near the top and bottom of each of the four discs; there was thus a strong resemblance to the polar caps of Mars when that planet is viewed with inadequate power. Ganymede supplied more detail than the others. The satellites showed varying amounts of ellipticity, possibly a result of imperfectly seen darker areas on them. But the surprising point in the obser vations is the appearance of Callisto to Cave; we quote:"....the thing that first struck me was a very fuzzy appearance around the disc, almost like the coma about a comet." At almost the same time that Mr. Cave's observation arrived, we received an article from J.C. Bartlett on Jovian satellite appearances, which we plan to publish in our next issue In it Dr. Bartlett says of Callisto:"The writer has also seen the disc nebulous and indistinct and at other times very sharply defined." The coincidence is a bit surprising.

We hope that all this discussion will indicate that good planetary work is being done by amateurs with ordinary-sized telescopes. Why not share in it?

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S T A F F

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