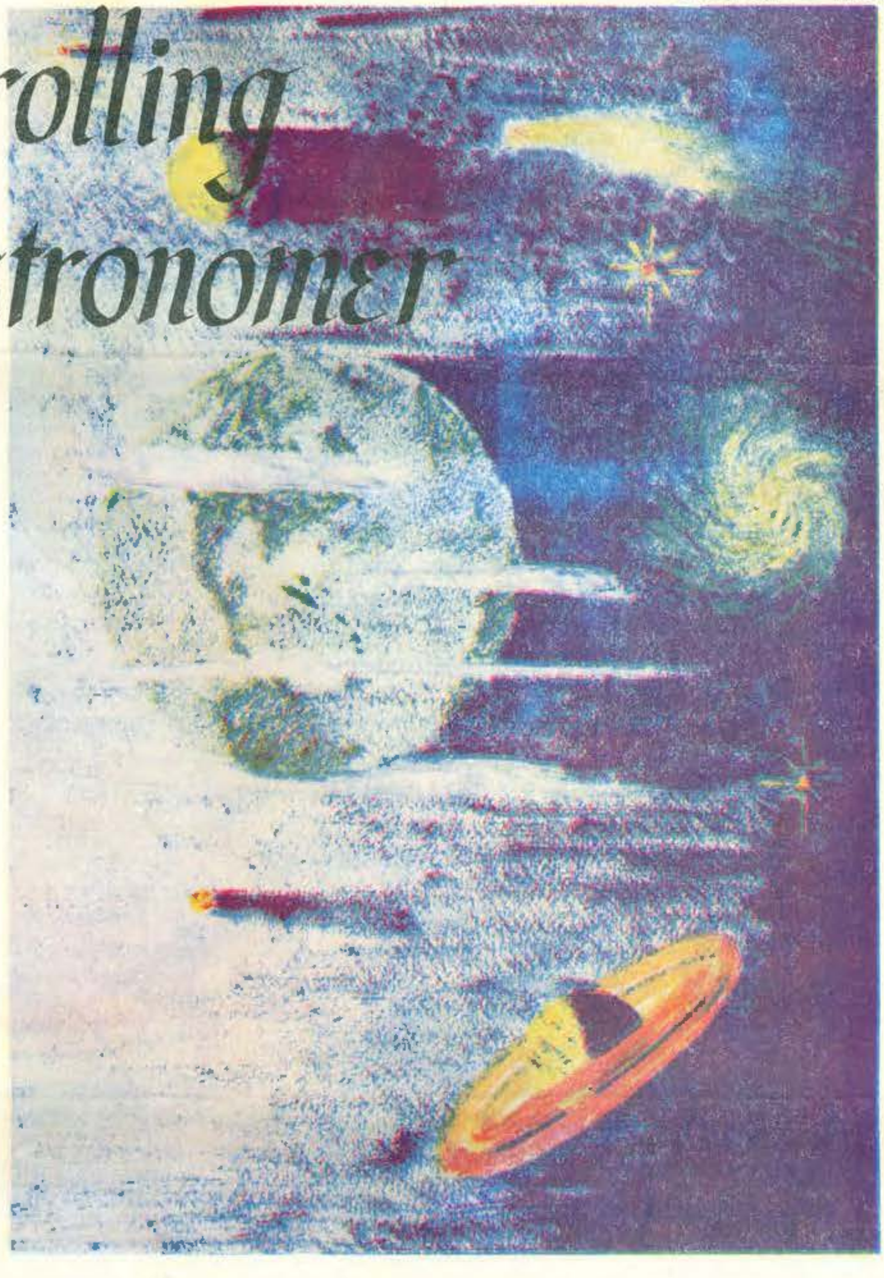
The Strolling Astronomer

Volume 4, Number 9 September 1, 1950

ASSOCIATION OF LUNAR AND PLANETARY OBSERVERS



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S U B S C R I P T I O N   R A T E S

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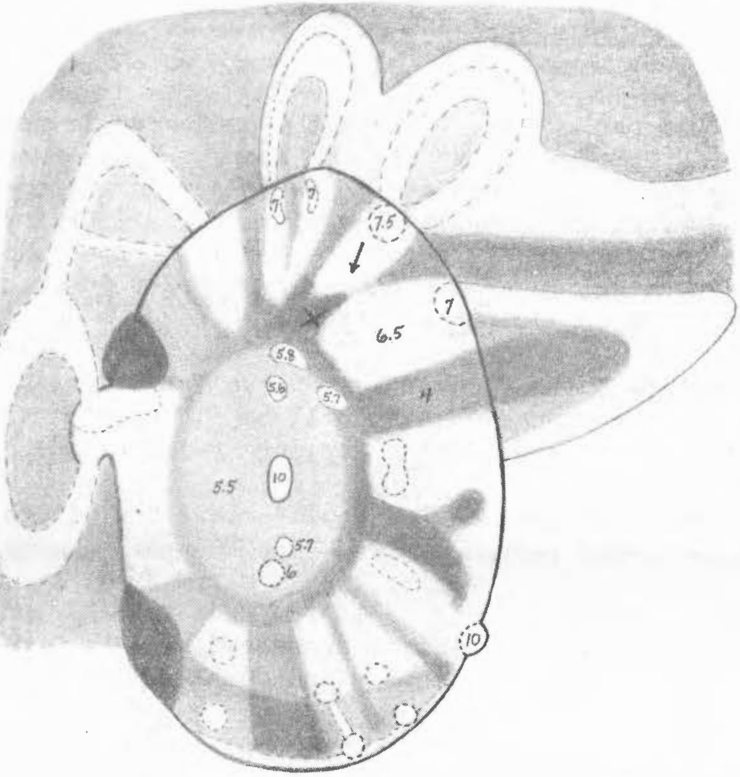


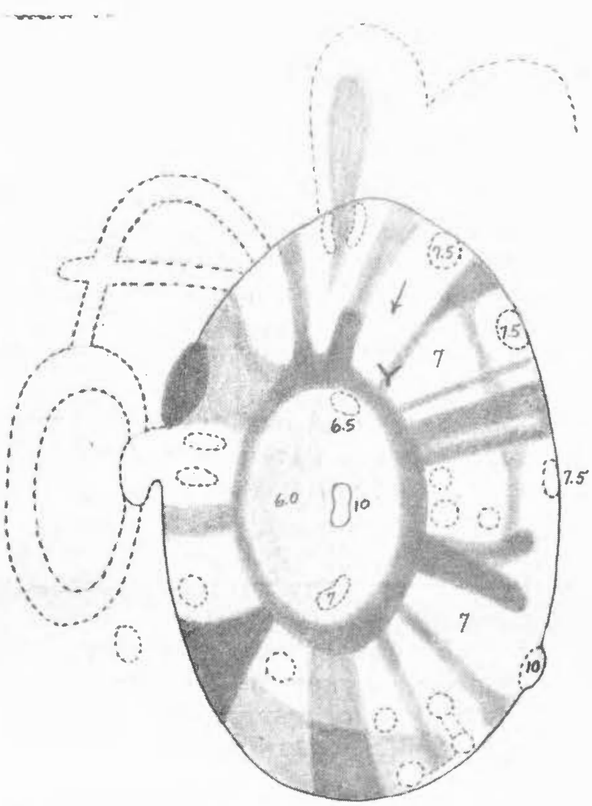
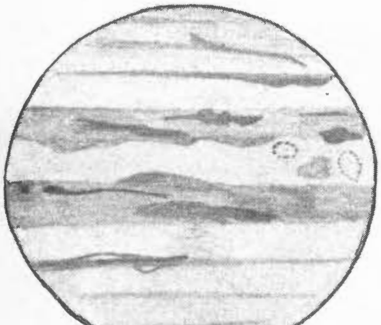


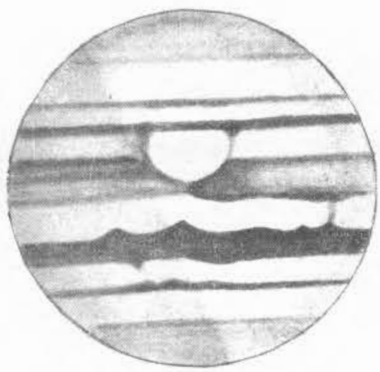
Fig. 1
Colong. 109°.1
Jan. 16, 1949
$4^h\ 00^m$ U.T.
S6, T3

ARISTARCHUS

E. J. Reese
~~6-in. refl.~~
240X.

Fig. 2
Colong. 102°.6
Oct. 8, 1949
$5^h\ 05^m$ U.T.
S5-6, T4





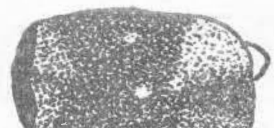


Fig. 3. Jupiter.
T. Cragg. 6-in. refl.
May 21, 1950.
$10^h\ 20^m$, U.T.
104X.
$CM_1 = 0°$, $CM_2 = 8°$.

Fig. 4. Jupiter.
T. Saheki. 8-in. refl.
May 18, 1950.
$19^h\ 25^m$, U.T.
330X, 160X.
$CM_1 = 218°$, $CM_2 = 246°$.

Fig. 5. Plato
H. G. Allen. 3.5-in. refl
May 28, 1950.
$2^h\ 45^m$, U.T.
100X.
Colong. 46°7

RFMINDERS AND POLICY STATFMFNT

In our next issue, the one for October, we shall begin the photographic reproduction of the sections of the H. P. Wilkins map of the moon. Those who would like to receive The Strolling Astronomer unfolded in large envelopes during the period that the map is appearing may do so by sending one dollar for this special service. This sum must be received before September 15. Those who would like to have the complete photographed lunar map at once may order it from The Stevens Agency, 202 S. Broadway, Albuquerque, New Mexico.

We remind our readers that the back outside cover is now available for advertising. Rates for advertising in an exchange-column will be five cents per word, including addresses. Write the editor about rates for larger insertions.

If these reminders seem too frequent, the editor would plead that it is well known that college professors have very poor memories!

We shall take space for a general statement of policy. Whenever signed articles appear in The Strolling Astronomer, the opinions expressed are those of the person or persons whose names appear. These opinions need not be those of the staff of this periodical.

THE COMING LUNAR FCLIPSF OF SEPTEMBFR 26, 1950

We direct the attention of our readers to a total eclipse of the moon visible in the United States later this month. The circumstances are as follows:

	Universal Time	Pacific Standard Time
Moon enters penumbra	Sept. 26, $1^h\ 20^m$	Sept. 25, 5:20 P.M.
Moon enters umbra	2 32	6:32
Total eclipse begins	3 54	7:54
Total eclipse ends	4 40	8:40
Moon leaves umbra	6 2	10:02
Moon leaves penumbra	7 14	11:14

Add one hour to P.S.T. to get M.S.T., two hours for C.S.T., and three hours for F.S.T. Add one hour more where Daylight Saving Time is in use. It is proposed that A.L.P.O. studies of this eclipse consist of two principal programs: the systematic search for possible lunar meteors and meteoritic impact-flares and the careful examination of a few selected lunar regions for possible changes caused by the shadow's passage.

The lunar meteor searches are best carried out only while the eclipse is total. During the 46 minutes of totality all participating observers should watch the moon as carefully as possible and as nearly continuously as possible.

Casual watches are worth relatively little. An eclipse is a very unusual opportunity to see possible lunar meteors against a relatively dim lunar background. It would be of great significance if two observers would independently record the same bright speck against the moon. Observers should employ a magnification low enough to show the entire moon; otherwise, they should watch those portions of the moon most deeply immersed in the earth's shadow. On September 26 (U.T. date) the moon's south limb will be most deeply immersed. An observer who witnesses any unusual bright object should record its exact time of appearance, preferably to the nearest second, and its precise location on the moon, perhaps marked on a chart. If an observer merely suspects an object, he should still report it as suspected; for someone else may have had a clearer view of the same object.

A weakness of searches for lunar meteors at past eclipses has been that it is usually very uncertain just how faint a lunar meteor or meteoritic impact-flare the observer might have perceived. We hence urge that at the September 26 eclipse each observer make a quick but accurate sketch of stars visible to him near the moon. Such sketches will best allow very helpful intercomparisons of the limits of visibility of stars (and hence of lunar meteors and impact-flares) for different observers if they are all made at the same time. Therefore, we urge each observer to make his sketch between 4^h 15^m and 4^h 20^m, U.T., thus near the middle of totality. The corresponding P.S.T. is 8:15 to 8:20 P.M. The stars shown can later be identified in atlases which give their magnitudes.

In reporting searches for possible lunar meteors or flares one should record the usual data about observer, station, telescope, magnification, seeing (or steadiness), and transparency. There should further be recorded the beginning and ending times of the search, the number of minutes spent in actual watching (since 100% efficiency is hardly to be expected), the region watched if other than the whole moon, a sketch of the sort described above, and the results. If any unusual luminous object is seen, there should be reported its time of appearance, its position on the moon, its angular diameter, its stellar magnitude, the length of its path (either in angular units or relative to some crater), the lunar direction of motion, the duration of visibility, the color, and any other noteworthy characteristics.

The following objects are suitable ones to study for possible eclipse-caused changes:

1. Linné. Watch carefully the size, brightness, and sharpness of the white area around this crater. Equipped observers might undertake micrometrical measures of the diameter of the white area.

2. Eratosthenes. Estimate the intensities of the dark areas on the floor and walls, especially of those in the east half of the floor.

3. Grimaldi. Watch for changes in the darkness of the floor, or parts thereof, and in the brightness of the bright spots along the west wall. Pay especially close attention to the three bright spots forming a right triangle near the northwest rim of Grimaldi.

4. Atlas. Watch the intensity and appearance of the two main dark areas on the floor, the one near the south wall and the other northwest of the central mountains, and of the narrow dark band joining these two areas.

5. Stoefler. Fxamine carefully the dark areas on the floor, and compare the intensities of the ones in its east and west parts.

6. Conon. Note the size, brightness, and general appearance of the floor "cloud",a variable somewhat triangular white area based upon the northwest wall.

7. Riccioli. Watch closely the south tip of the conspicuous dark area in this crater, and note its darkness. Micrometrical measures of the north-south length of this dark area are desirable; otherwise, visual estimates of the latitude of the south end relative to other lunar objects may be made. Note whether the south end is pointed or rounded.

8. Mare Crisium White Spots. Watch closely the appearance of No. 7 and No. 8 on P.A. Moore's map on pg. 251 of Journal of the British Astronomical Association for October, 1949. No. 7 is one north-south diameter of Picard west-northwest of the middle of the west rim of Picard. No. 8 is one and one-third north-south diameters of Picard south of No. 7.

No one should try to study more than four objects out of the eight listed. Otherwise, there will be time only for superficial views. Especially for beginning observers, it may be better to select less than four. The same telescope and the same eyepiece should be used for all observations in this program; one source of false variations in appearance of lunar regions is thus removed. It is obviously important to know the usual full-moon appearance of the regions watched for eclipse-caused changes. Photographs of good quality can here be helpful. However, visual check observations with the telescope and eyepiece being used in the program can scarcely become too numerous. The lunar areas being studied should be observed, if possible, before immersion in the umbra, on the night before the eclipse and also on the night after, and in at least one other lunation at about the same solar illumination as will prevail on the night of the eclipse.

It is best to make many of the observations suggested above by comparisons to other lunar features not far away. For example, the darkness of the floor of Grimaldi may be compared to that of Oceanus Procellarum; and the size of Linné may be compared to that of a number of white spots on Mare Serenitatis. Such relative estimates of intensities and sizes are likely to be far more dependable than attempted absolute ones. Each observer should select the comparison-areas he desires to use with some care, and here again good photographs of the full moon can be helpful. It will be an important advantage on the night of the eclipse, however, to have gained thorough familiarity at the telescope with each lunar object being watched for possible eclipse-caused changes and its neighboring comparison-areas.

On the night of the eclipse each object on the program should be examined carefully soon after it leaves the umbral shadow. If anything in the least abnormal is seen, it should be reobserved at short intervals until the normal full-moon appearance returns-or else for as long as possible. One must be very careful here not to be deceived by penumbral illumination, and it is probably quite impossible on this account to establish the reality of eclipse-caused changes that do not endure for at least 15 minutes. In testing for such penumbral effects it is an advantage if the observations allow the appearances a certain number of minutes after emersion from the umbra to be compared with the appearance the same number of minutes before immersion in it.

The time of each observation in this whole program must be noted if the work is to have value. Observers are requested to time when each object that they watch enters the umbral shadow and when it leaves the umbra.

Some astronomy clubs might like to watch for lunar meteors as a group-project. The procedure followed by the Springfield Stars Club (Mass.) a year ago and described on pg. 10 of our August issue is highly recommended.

We wish all our members good skies on September 26 and look forward to receiving at their early convenience reports of what they saw.

OBJECTS SEEN CROSSING THE SUN AND MOON

by David W. Rosebrugh

In the next to last paragraph on page 8 of the June, 1950, issue of The Strolling Astronomer the remark is made that "observations of dark objects against the moon are perhaps fairly common".

I have seen many an odd object cross the sun while counting sunspots. Some of these I have been able to identify with certainty; others I have had to identify by making assumptions as to size, distance, height, and speed. For each apparition one can by trial and error work out a solution which does not seem too unreasonable in any particular, though some of the conclusions may seem rather remarkable.

For instance, late one summer afternoon in 1949 my attention was attracted by a round black sunspot consisting only of umbra with no penumbra. Just as I was going to enter it on my sketch I noticed that it was moving across the sun's disc, which it took about 15 seconds to cross. By comparison later with the size of some of the real sunspots I concluded that it was 1/72nd of the sun's diameter. The telescope was pointed at an angle of 13 degrees above the horizon. I made a guess that the object was a radiosonde balloon sent up by the Weather Bureau at Albany, N. Y., some 84 miles away and that it was 30 feet in diameter. Since it was 1/72nd of the sun in diameter, the sun's disc at the same distance would appear 2160 feet in diameter. The sun appears the same size as a 1-foot circle 110 feet distant so this made the distance of the balloon 2160x110 or 237,600 feet or 45 miles. Since the proper motion of the object carried it across the sun's disc in 15 seconds its proper velocity(perpendicular to line of sight) was 2160 feet in 15 seconds or 98 m.p.h. The sine of 13 degrees is 0.222 so this made the object 45 miles x 0.222 or 10 miles above the ground.

It is my impression that radiosondes are designed to burst at a diameter of around 10 metres and a height of about 15 miles so there is nothing inherently improbable in any of the figures of my solution.

In any case the object was not an interplanetary object at a distance of, say, 2000 times as great, or 90,000 miles; for if it had been, the proper motion would have been 53.2 miles per second, and the object's diameter would have been 60,000 feet or 11.4 miles. Both the speed and size seem improbably large. Moreover, it was probably not a toy balloon 1 foot in diameter at a distance of 1½ miles; for its proper velocity would have been only 3 miles per hour, which is unreasonably low since a brisk breeze was blowing at the time at approximately right angles to the direction of the balloon.

Among the odd objects which I have seen crossing the sun are: a bee, this radiosonde balloon, 2 airplanes at estimated distances of 5 and 11 miles, balls of fuzz from locust tree blossoms, leaves blown high into the air by the wind, swarms of insects, bluejays, crows, ducks, herons, and many unidentified birds. Would not a dragonfly present a very remarkable appearance if it crossed the sun? A meteor in the earth's atmosphere crossing the sun would probably move too fast to be perceptible, unless it left a trail of black smoke.

I once saw a bird which I took to be a blue heron 4 feet in size fly across the sun. I have forgotten the data now, but I do remember that it worked out as being 11 miles above the ground and flying at about 150 m.p.h. These figures seem unreasonably large, and perhaps they should be cut in half; but Mr. Neal J. Heines, Director, Solar Division, AAVSO has arrived at somewhat similar conclusions in the case of birds which he has seen cross the sun. The original observations upon these apparitions were reported to the University of Louisiana.

On another occasion I saw what I believe to have been 3 wild ducks cross the sun at a height which I later estimated as being 5 miles. One swerved in flight; the plumage of all glistened in the sun; and their flight could be seen both a little before entering, and a little after leaving, the disc.

Among odd objects which I have seen through my telescope when observing variable stars at night are glowing fireflies and telescopic meteors. When observing the moon in April, 1928, from my former home in the Hudson River valley with an 8-inch reflector, I saw migratory birds cross the full moon at the rate of one every few seconds for many minutes.

Hence, almost everything which flies around in the air will eventually be seen crossing either the sun or moon by the ardent solarian or lunarian. However, I have not yet seen a helicopter nor a flying saucer, unless my assumed radiosonde balloon was one; nor have I yet seen anything which I believed to be outside the earth's atmosphere except Mercury at its transit on May 7, 1924. That of Nov. 11, 1940, was clouded out for me.

Postscript by Editor. We are glad to have Mr. Rosebrugh's contribution to the discussion in various issues this year of dark objects seen against the sun or the moon and their interpretation. His arguments deserve the more weight because he has long been an active observer of variable stars and the sun. Our contributor's address is 79 Waterville St., Waterbury 10, Connecticut.

ASTRONOMICAL LEAGUE CONVENTION
Planetary Highlights

by Rolland R. La Pelle

The annual convention of the Astronomical League was held on July 1 to 4, 1950, at Wellesley College, Wellesley, Mass. A registered attendance of 230 made this the largest convention so far held. Delegates attended from more than 35 amateur societies in more than a score of states and Cuba. A full set of photographs of convention delegates and activities appeared in the August issue of "Sky and Telescope". Reports indicated that the League now has 55 member societies, with more than 2000 individual members. A new Region, comprising Missouri, Kansas, and adjacent territories is now in the process of formation and will bring a further increase in League membership. The League thus becomes more and more the primary astronomical body of amateurs in the United States, and several societies in foreign countries are now considering affiliation.

The technical program included sessions for papers on variable stars, the Sun, meteors, aurorae, the occultations, astronomical instruments, the Moon, and the planets. An outdoor "School for Observers" was conducted during the convention with instructors on hand to advise those interested in observing about observational techniques. Contests for amateur telescopes and other instruments and for photographs and other material of an astronomical nature were held; and numerous interesting exhibits resulted, including drawings of Mars by Thomas R. Cave, Jr., of the ALPO. A surprise feature was the award of prizes for the best papers presented, one award going to Walter Haas, of the ALPO, for his excellent papers on the Moon, Saturn, and Mars.

The planetary session was under the chairmanship of John Streeter, of Vassar College Observatory and the ALPO. Papers presented included Recorders' reports on Mercury by C. B. Stephenson on Venus by Thomas Cave, Jr., on Saturn by Walter Haas, on Jupiter by Elmer Reese, and on Mars and the Moon by Walter Haas, all being based on work done by ALPO observers. Since these papers were, in general, summaries of material already reported at more length in "The Strolling Astronomer", they will not be reviewed in detail here.

Raymond Missert, of the Buffalo Amateur Telescope Makers and Observers and the ALPO, not only read Walter Haas' paper on Saturn but also gave one of his own on "Variability of the Saturnian Satellites." Missert first described the historical information relating to this subject and then presented curves based on observations by Flmer Reese and by Messrs. Heath and Steavenson of the British Astronomical Association, illustrating the variability of Japetus. Discussion which followed emphasized the difficulty of these observations and the desirability of having an optical or photoelectric photometer to achieve greater accuracy.

Dr. Joseph Ashbrook of Yale Observatory presented a paper on a "New Aspect of Planetary Observations". This paper concerned a study of planetary variations in brightness. Dr. Ashbrook showed that after making suitable allowances for the effect of varying distances and variations in apparent area of the disc due to the position of the pole of rotation, the planet Uranus still showed unexplained variations in brightness. The variations apparently include not only short period fluctuations of about 0.1 magnitudes synchronized with the planet's rotation (due perhaps to dark and bright surface features) but also long period variations of greater amplitude with periods of 11 to 13 years. These presumably reflect solar variations, although exact correlation is lacking. Similar variation is evident in the case of Saturn, although here large corrections have to be applied for the tilt of the rings, in addition to the other factors. Useful observations of these variations will require a photoelectric photometer, or at least a very good optical photometer, since accuracy of the order of 0.1 magnitudes is essential.

During the session on astronomical instruments, chairmaned by Stanley Brower of Laboratory Optical Co., a paper by Dr. James C. Bartlett, Jr., was read, entitled "Lunar Changes with Color Filters." This paper described the uses of filters of various colors to determine lunar colors and color changes.

It was pointed out that not only were different colors observed in lunar features but that in some regions these colors showed progressive and unexplained changes during the progress of a lunation and even from lunation to lunation under the same lighting. Filters suitable for this purpose were suggested. During the discussion,Prof. Streeter pointed out the desirability of using "closed" in place of so-called "open ended" filters so that the color desired can be better isolated from both longer and shorter wave lengths.

A paper by Thomas R. Cave, Jr., was presented entitled "The Ideal Planetary Telescope". This paper pointed out the desirability of long focal ratios for planetary work and indicated that a 10-inch or 12-inch reflector of f/12 or f/13 is perhaps the best for use by amateur observers of the planets.

Of interest to ALPO members is the decision of the Astronomical League Council to sponser an Observer's Manual to serve as a sort of"Laboratory Manual" for amateur observers. David Rosebrugh is currently making a start on material for this book, which it is hoped may be complete within the next year. This Manual will contain chapters on lunar and planetary observing and should be of much help to those interested in this field of astronomy. It will also contain illustrative sketches and maps of the planets.

It is hoped that in the future the ALPO may join the Astronomical League as a full fledged member to further aid in this work.

Postscript. Mr. La Pelle is the activities Chairman of the Astronomical League, and the success of the Wellesley Convention doubtless owed much to his efforts. His address is 54 Fernleaf Ave., Longmeadow 6, Massachusetts. For some time the editor has been considering taking a poll of members of the Association of Lunar and Planetary Observers in regard to whether or not they desire us to apply for membership in the Astronomical League.

CONCERNING MARS, SATURN, AND THE MOON

In the February, March, April, and May, 1950, issues of The Strolling Astronomer we discussed two gray cloud-bulges observed on the south limb of Mars in Japan this year, the one on January 15 and the other from March 29 to April 2. In a letter written on April 21 Mr. Shirō Ebisawa, one of the observers of these clouds, outlined an interesting possible evolution of each gray cloud. Readers are referred to pages 11 and 12 of our May issue for a description of changes in the color and brightness of the March-April gray cloud. Ebisawa suggests that such a cloud, perhaps composed of volcanic ashes, gradually diffuses and changes color,becoming an ordinary white cloud after ten days or more. To be sure, it is high enough to cause an observable projection at the edge of the disc for only a few days. In the editor's opinion Ebisawa's attempted later identifications of the January 15 grey cloud are very uncertain. Nevertheless, the concept of volcanoes in the antarctic regions of Mars should add to our interest in watching them!

Writing on July 13, T. Saheki gave details of an unusual observation of Mars by Mr. Mayeda in Japan on June 4, 1937, with an 8-inch reflector at 500X. Mayeda saw a very brilliant small spot in the north-northwest corner of the disc, perhaps near Sithonius Lacus. It was brighter than the north cap. (The season was late summer in the northern hemisphere.) The spot sometimes blinked. Whether or not it projected at the limb is very uncertain. It was seen for about five minutes and then disappeared, perhaps because Mars rotated or perhaps because clouds near its position obscured it. The "color" was very abnormal; it was totally unlike the white north cap or yellowish white clouds, and "its glare showed strongly as like a tiny sun." Poor weather prevented Mayeda from observing the next day, and he did not announce this observation until he reported it to Saheki in 1949. Saheki expresses great confidence in Mayeda's judging of colors on Mars.

During the last month we have received observations of Mars from T. R. Cave, Jr. (8-inch refl.), C. M. Cyrus (10-inch refl.), W. H. Haas (6-inch refl., 8-inch refl.), E. E. Hare (12-inch refl.), and D. O'Toole (6-inch refl.). Some of the observations reported were made several months ago, however. On September 15 the angular diameter of Mars will have decreased to 5"7. The north pole will be tipped toward the earth by 15 degrees. Quantity ⊙, the heliocentric longitude of the planet so measured as to be 180° at the vernal equinox of the southern hemisphere, will be 182°. Indeed, this equinox will have occurred a few days earlier on September 12. Obviously, the most effective views of Mars in September will be obtained by large telescopes of good quality. The editor would urge those using such telescopes to work very early in the twilight or even before sunset.

In July and August three observers still saw a north polar cap. Haas thought this cap brilliant on July 24 and 28 but rather dim on August 8, 13, and 20. Cyrus continued to see a north cap, his last view being on August 9; and it was his impression that the cap was still shrinking at that time. Going back a little, O'Toole on May 28 recorded a small white north cap to be surrounded by a larger, dimmer, yellow-white area. Heath and Murayama have also at times remarked such an appearance. O'Toole did not see the bounding north polar band on June 30, though he drew it in a poorer view on May 28. Hare saw the north polar band well in April, May, and even June, except when it was obscured in part by Martian clouds. On June 6 and 9, in fact, the band looked positively black to Hare in splendid seeing. Perhaps it had merely grown too thin to be detected clearly with apertures of less than 12 inches. We have no reports of the presence of this polar band on the small disc in July and August. In the spring of 1950 G. D. Roth in Germany with his 4-inch reflector often found the north polar band to be extremely wide, especially with a red color filter. He sometimes placed its south edge as far south as latitude 60° N. Hare obtained from visual estimates these average diameters for the north cap: 14° from April 16 to May 13 (5 estimates) and 14° from May 24 to June 9 (4 estimates). Hare's work with his excellent 12-inch reflector would indicate that the north cap was constant in size during April, May, and June and that it was slightly larger then - certainly not smaller - than near the middle of March. O'Toole measured his drawings to obtain for the north cap a diameter of 11° on May 28 and of 8° on June 30. He found for his "vapor hood" on May 28 a diameter of 35°. From July 24 to August 20 Haas obtained average diameters for the north cap of 28° from three drawings and of 21° from two estimates. It must be confessed that there are some rather large discrepancies in the numerical diameters found by different observers. Perhaps we shall be able to get better results in 1952 when the planet will be closer during a large portion of the northern hemisphere summer than it was in 1950.

Hare did not notice any south polar cap at all from April 16 to June 23. He did, however, remark Argyre I and a few other southern bright regions that could simulate a cap. On May 28 and June 30 O'Toole saw a large south cap, which was yellow-white in color. On May 28 it was <u>suspected</u> of projecting in the longitude of Hellas. O'Toole measured its diameter to be 60° on May 28 and 65° on June 30. Haas saw the south cap readily from July 24 to August 20; it was much more conspicuous than in previous months, or so he thought, and apparently varied from moderately bright to brilliant. He saw no bordering dark polar band. Haas found for the average angular diameter of the south cap 29° from four drawings and 21° from two estimates; it was much the same size as the north cap from mid-July to mid-August.

Clouds on Mars continued to be seen in July and August, especially in low latitudes on the limb. Haas sometimes noted a long brilliant arc along the north limb. Hare in April-June recorded a number of white areas, some of them variable, and it is natural to suppose that overlying clouds or mists are involved. Nix Olympica and two spots to its northwest were often seen whitened. An area following (east of) Iaxartes canal was whitish to Hare on May 9 but not on May 13. On June 8 and 9 he saw a white cloud near the east end of Deucalionis (between Sabaeus and Margaritifer); by June 12 this cloud had almost disappeared. On May 17 near C.M. 286° and on June 12 near C.M. 20° Hare noted a white collar, presumably clouds, outside of the north polar band (pg. 12 of August issue). An area north of Acidalium that had been very white to Hare from February 18 to 27, perhaps with mists from the spring melting of the north cap, was "desert color" to him on June 9. This observer found Syrtis Major rather dim on the C.M. on June 23; and Protonilus canal, which had been dark on May 13, looked blurred out on May 16. Martian atmospheric obscurations?

O'Toole on May 28 at C.M. 261° found all dark areas, even Syrtis Major, to be brown or chocolate in color. T. Saheki with an 8-inch reflector from mid-June to mid-July recorded a chocolate color in Sinus Sabaeus, bluish gray in Mare Sirenum, Mare Erythreum, and Syrtis Major, black with some blue or green in Mare Acidalium, brownish in Propontis-Castorius, gray in some canals and lakes, and yellow in Elysium.

Since Mars was growing more and more remote, little can be added to descriptions of surface features in past issues. Mare Acidalium remained very dark, being intense even when some hours off the central meridian. On May 4 Hare found Achillis Pons wider than before; in the same view he called Lunae Lacus more dusky, Mare Erythreum more definite or wider, and Oxia Palus faint. Saheki drew Achillis Pons rather wide in June. Hare saw Argyre I as a white area several times in June. On May 4 Sinus Aurorae appeared to him to have a small and difficult north point. In late June Saheki still represented Nilokeras as a pair of converging canals, and on one date he glimpsed an irregular and complex structure here. Saheki and Haas recorded Lacus Phoenicis and sometimes saw Nodus Gordii in June and July rather definitely as a fairly large dark spot. Mare Sirenum was regularly very faint to Hare but was sometimes rather dark to Saheki and Haas. In June and July Haas sometimes suspected that Propontis was composed of two dark spots but could not be sure. Saheki, however, not only distinguished Propontis I and II as separate objects but even saw much irregular structure and many darkish knots in this vicinity. The appearance resembled that of the Casius-Utopia shading as shown on Figure 6 on pg. 1 of the August issue. On August 2 Cave thought the Casius-Utopia shading stronger than a month before, while Nepenthes canal was prominent. However, Casius was fairly intense to O'Toole on June 30 and to Haas on June 24 and 26. Cave thought the north tip of Syrtis Major perhaps more blunted on August 2 than earlier in the apparition. Sinus Sabaeus was still very dark to Saheki on July 3 and 4, being darkest of all at the Forks of Aryn. On

May 13 Hare was still able to divide Deuteronilus from Tritonilus (pg. 13 of May issue), as Saheki also did on several dates. (Refer to Figure 5 on pg. 1 of August issue.)

During the last month we have received a very small amount of new observational material on Saturn from W. H. Haas (6-inch reflector), F. F. Hare (12-inch reflector), G. D. Roth (4-inch reflector), and J. E. Thrussell (4-inch refractor). Haas' only view was on July 24 under poor conditions and showed nothing unexpected. The North Tropical Zone was rather dull (pg. 15 of August issue). Hare wrote of his own observations: "On May 4, 8, and 9 it was noted that the North Temperate Belt was very dim compared to previous months. The last date the N.T.B. could be divided [into two components] was on May 13." Mr. Thrussell's drawings are in natural colors and were obtained from March, 1949, to May, 1950. On May 9, 1950, he saw the Crape Band very clearly south of the projected rings. On April 3, 1950, he depicted the Crape Band as a double line; the same curious aspect was seen last spring by Hare and Haas (pg. 11 of April issue and pg. 11 of June issue). They interpret the south component as the shadow of the rings and the north component as the dark projection of Rings A and B against the ball (these rings being darker than adjacent parts of the ball.)

During May, June, and July the Crape Band on Saturn was prominent, far more so than any of the cloud-belts. Several observers, unlike Hare and Haas (see above), easily recognized the projected rings to be such; and near May 20 L. T. Johnson and T. Saheki even resolved the shadows from the rings themselves close to the limbs of Saturn. Johnson used a 10-inch reflector; Saheki, an 8-inch reflector. The width of the separating space between the south edge of Ring B and the north edge of the shadow of Ring A was about 0."08 near the limbs on May 20. The combined widths of the shadows of Rings A, B, and C at the central meridian was about 0."27 on June 1 but only about 0."14 on July 20, when they were still easily visible even in poor views. These figures are taken from graphs drawn by L. T. Johnson. They should be of interest to students of the visibility of fine detail on planetary surfaces.

We return to Mars for a moment. Using a 13-inch reflector, Ebisawa has come to the conclusion that the canals of Mars are narrow and geometrical-looking in good seeing. They become vague, indefinite half-tones - in brief, Antoniadian - in poor seeing. In a good view on April 12 Ebisawa found Ganges canal to be "a very beautiful <u>narrow</u> <u>line</u>." Although it is true that the work of one observer will hardly settle the long controversy about the nature of the canals, it appeared worthwhile to put Mr. Ebisawa's experience on record.

We have failed to report observations of colors on Saturn in recent months. The nomenclature used here is given on Figure 1 on pg. 1 of the March, 1950, issue. Perhaps J. C. Bartlett, Jr., has been the most studious observer here; he employed a 3.5-inch reflector and color filters. From March to July the shaded South Polar Region was often brownish to him; the North Polar Region, bluish or sea-green. The Equatorial Zone was white, the whitest part of the ball except for the sometimes equally white space between the North Temperate and North North Temperate Belts. The belts usually showed gray or brown tones to Bartlett, rarely blue ones. The North Tropical Zone was brownish after it became dusky in late June. The general tone of the disc was whitish yellow. Employing a 6-inch reflector and color filters, Haas found from March to June brown and red-brown tones in the South Equatorial Belt and North Temperate Belt, blue-gray in the South Polar Band, bluish gray in the North Polar Band, bluish gray in the South Temperate Zone and the North Temperate Zone (the N.T.Z. averaging the more blue), and white in the Equatorial Zone and North Tropical Zone.

The Crape Band was a dark, rich red-brown to Haas. Heath in March with a 10-inch reflector recorded red, brown, and orange tones to the south of the S.F.B., while the color north of the N.T.B. was instead bluish gray. Saheki with an 8-inch reflector several times saw the N.T.Z. to be bluish relative to the S.T.Z.; Heath and Haas here give him some confirmation. Reese on December 16, 1949, in excellent seeing with a 6-inch reflector found the E.Z., N.Tr.Z., and Ring B at the ansae white, Ring A at the ansae pale blue, the N.T.Z. and N.P.R. gray, the S.T.Z. yellow-gray, and the S.F.B. brown. We learn from Figure 3 on pg. 1 of the August issue that Roth on June 2 with a 4-inch reflector saw gray-brown in the S.F.B., brown-black in the S.P.B., gray-white in the S.P.R., blue-gray in the N.P.R., yellow-white in the S.T.Z., and white in the E.Z. Hare with his 12-inch reflector in December, 1949, and January, 1950, easily saw red and pink tones in southern hemisphere belts; but northern hemisphere belts were sensibly gray, perhaps showing some greenish tints. Using a 6-inch reflector and color filters from November, 1949, to March, 1950, Brinckman found Ring B pure white, Ring A light gray, the S.F.B. reddish or brownish, the N.T.B. at various times lavender, gray, and brownish, the N. Tr. Z. an intense lemon-white on December 2, the S.P.R. neutral gray once and olive or bluish once, the E. Z. white with some yellow or orange, the S.T.Z. bluish on March 3, and brighter areas in the zones varying from white to yellow.

On pg. 15 of the August issue it was described how Haas on June 21 observed the preceding end of a darker section in the North Temperate Belt. If this darker section is the fast-moving one followed from November 3, 1949, to April 15, 1950, and if 168 rotations intervened between the April 15 and June 21 views, there results a rotation-period of 9 hrs., 33.4 mins. Both assumptions are extremely uncertain. We now note that a drawing by G. D. Roth on June 12 at 20^h 10^m (U.T., as usual) shows the following end of a very dark section in the N.T.B. near the central meridian or a little past. The question at once arises: can this section be the same one that Haas observed on June 21? Haas did not observe the fol. end on the C.M. on that date; but if we assume from past data that the section required about 50 minutes to cross the C.M., then the transit of the fol. end would have occurred near 4^h 35^m on June 21. We shall suppose that it was on the C.M. for Roth at 20^h 0^m on June 12. Assuming 21 intervening rotations, we get a period of 9 hrs., 33.1 mins., a value curiously close to the 9 hrs., 33.4 mins. cited above. Another item of interest should be set down here. If the darker section preserved its rotation-period near April 15 beyond that date, then it can be computed that a transit of the following end should have occurred at about 21^h 25^m on April 30. Now when Roth drew Saturn at 22^h 45^m on April 30, he did indeed see the fol. end of a darker section near the west (left in simply inverted view with south at the top) limb of Saturn. It is proper to add, however, that N.T.B. darker sections depicted by Roth on March 7 at 20^h 45^m and on June 5 at 21^h cannot be identified with the fast-moving darker section under discussion here and its presumed rotation. Even so, the evidence for a survival of this darker section after April 15 is appreciably strengthened. Perhaps some readers have unreported observations of N.T.B. detail that may shed important light on the proposed extrapolated drift. If so, we request that all such data be quickly sent to us.

We now direct the attention of readers to Figures 1 and 2 on pg. 1. There is here a most excellent opportunity to compare two independent drawings of a lunar crater obtained by a skillful and experienced observer with the same telescope and eyepiece and similar atmospheric conditions. Mr. Reese writes: "These two drawings of the lunar crater Aristarchus were made under similar conditions of solar illumination in two different lunations. It will be noticed that the general pattern of detail is the same in each drawing. However, a number of minor differences are apparent. The majority of these differences very probably result from observational errors; however, I feel rather confident that the orientation of a wall band (indicated by arrows on the above drawings) on the southeast inner wall was abnormal on October 8, 1949. The drawing on January 16, 1949 shows the normal appearance of this band - as does H. Hill's drawing of Dec. 9, 1946 at colongitude 105°." The X on Figure 1 marks the normal position of the foot of the wall band being discussed. The Y on Figure 2 marks the abnormal position of the foot of this band on October 8, 1949. It is an interesting speculation to wonder whether this abnormal position can be related to the lunar eclipse on the preceding date, October 7, 1949. It would certainly do no harm to watch for such a possible eclipse-caused change during the coming eclipse on September 26, 1950. Why not look at Aristarchus a few times that night? The abnormal orientation of the wall band on October 8, 1949 is not quite an isolated example; for C. M. Cyrus drew the aspect shown by Figure 2 on December 3, 1941 at colongitude 83°. He was using a 10-inch reflector in excellent seeing. The numbers on Figures 1 and 2 are intensities of lunar features on the Standard Scale of zero (shadows) to ten (most brilliant marks).

In a letter dated June 28 Reese proposes that the dark bands on the walls of Aristarchus and Conon (and other craters?) are regions of lesser elevation than adjacent portions of the walls. He has seen two V-shaped projections to the morning shadow in Aristarchus while its edge moves down the east inner wall; these projections vanish as soon as the shadow-edge reaches the floor.

C. Wierzbicki reports seeing a curious object against the moon on February 26, 1950 at $6^h 50^m$, U.T. He was observing at Buffalo, New York, with a 3-inch refractor at 90X. An object resembling a gray cloud and roughly the diameter of Maginus (or roughly 1'40")appeared at the western end of the Altai Mountains and moved to north of Purbach, where it vanished. It travelled this distance in approximately six seconds. Therefore, its angular velocity results as about 1.3 minutes of arc per second of time. The "cloud" seemed to obscure surface detail on the moon as it moved along. There were no clouds in the sky at the time, and the seeing was good. Wierzbicki writes that he spends much time in watching the moon but that he had never before seen anything of this kind. The editor thinks that this object is best interpreted as something in the earth's atmosphere in accord with principles laid down by D. W. Rosebrugh in his article elsewhere in this issue. In particular, the large angular diameter would require a linear diameter of about 500 feet at a distance of only 100 miles and very fantastic sizes for an object near the moon's surface.

Plato has been observed in recent months by H. G. Allen (3.5-inch refl.), J. C. Bartlett, Jr. (3.5-inch refl.), D. R. Curey (3.5-inch refl.), and C.M. Cyrus (10-inch refl.). Cyrus with his large aperture and fairly good seeing observed on June 24 at $0^h 50^m$, U.T. The colongitude being 15°7, Plato was seen under low lighting. Cyrus gave close attention to the north central pair of craterlets (numbers 3 and 4 on Figure 2 on pg. 1 of May issue). He could barely see the eastern craterlet while the western one was readily visible as a shadow-filled pit. Readers might here refer to "The Twin Craterlets in Plato" on pp. 3-5 of the January, 1949 <u>Strolling Astronomer</u>. Cyrus' recent view agrees with some past observations and disagrees with others. The eastern of the twins wa much the less conspicuous to B.A.A. observers in 1869-72 and 1879-82 and to

W. H. Pickering in 1892; however, the twins were much the same size to Fauth and, more recently, to Reese, White, and Haas from 1943 to 1949. Of course, we cannot seriously suppose that the craters vary in size; but a careful study of the relative apparent sizes of the twin craterlets with adequate optics is highly recommended. Figure 5 on pg. 1 shows the appearance of Plato with a very small telescope and may be encouraging to those having only very modest optics. It may be compared to Figure 2 on pg. 1 of the May issue, a drawing obtained by F. K. White with twice the aperture that Mr. Allen had. Bartlett on July 23 at colongitude 10°9 compared the darkness of the floor of Plato to that of Mare Frigoris to its north. Plato and Frigoris were equally dark with and without color filters; under high lighting Plato is much the darker to Bartlett. (Of course, this comparison does not prove that Plato darkens absolutely as the sun's altitude above its floor increases.) Bartlett noticed a faint, misty border to the shadow of the west wall, perhaps a contrast effect. He further reported that the crest of the east wall of Plato was at least three times as bright as the east inner slopes and wonders whether the crest may be covered by snow. Curey showed great industry in observing Plato on 14 dates from June 26 to August 1, often after midnight. He appears to have caught glimpses of several white spots on the floor, probably most frequently of the one numbered 5 on Figure 2 in the May issue. On July 7 between $8^h 15^m$ and $8^h 20^m$, U.T., the colongitude being 178°1, Curey thought that a spot apparently somewhat south of the center of the floor first grew dimmer, then became brighter, and after that quickly faded out. On July 23 a spot near the edge of the shadow in the west part of the floor was seen clearly at $5^h 39^m$ but faded at $5^h 47^m$, while other detail did not change. The colongitude was 12°6. Bartlett saw nothing of this spot at $2^h 14^m$ on the same date. Curey writes that he had excellent atmospheric conditions on both July 7 and 23; he used a power of 100X. It is unfortunate that Mr. Curey was not using a larger telescope; for the spots on the floor of Plato are so difficult with 3.5 inches of aperture that it must be hard to be certain of real changes in them, as apart from terrestrial atmospheric effects. Nevertheless, it is interesting in this connection that A. W. Mount and F. H. Thornton have each seen brilliant flashes in Plato, perhaps due to impacts of meteorites upon the moon (pp. 2-5 of the October, 1947 Strolling Astronomer).

METEORITICAL SOCIETY MEETING

The Thirteenth Meeting of the Meteoritical Society will be held on September 5-7, 1950, at Flagstaff, Arizona. Non-members are welcome to attend this meeting, and any interested A.L.P.O. members are cordially invited. The sessions for papers will open at 9 A.M. and 2 P.M. on September 5 and 6 at the Museum of Northern Arizona. An excursion to the famous Meteor Crater, which is about 50 miles east of Flagstaff, is scheduled for September 7.

It may be that some of our readers who are interested in meteorites would like to join the Meteoritical Society. Membership is open to all interested persons; the dues are only two dollars per year. Scientific papers about meteoritics appear each month in the Contributions of the Meteoritical Society section of Popular Astronomy. This material is bound into volumes from time to time and is distributed to members without charge. The Society holds an annual meeting, usually during the first half of September and sometimes in conjunction with other scientific associations. The President of the Meteoritical Society is Dr. Arthur S. King; and the Secretary is Dr. John A. Russell, University of Southern California, Los Angeles 7, California.

An added inducement to students of the planets to attend this Meteoritical Society gathering is provided by the proximity of the Lowell Observatory.