The Strolling Astronomer

Volume 5, Number 5 May 1, 1951

ASSOCIATION OF LUNAR AND PLANETARY OBSERVERS

The Strolling Astronomer
133 S. Alameda Street
Las Cruces, New Mexico

SUBSCRIPTION RATES

1 Year......................	$3.00
6 Months....................	1.50
1 Issue.....................	.25

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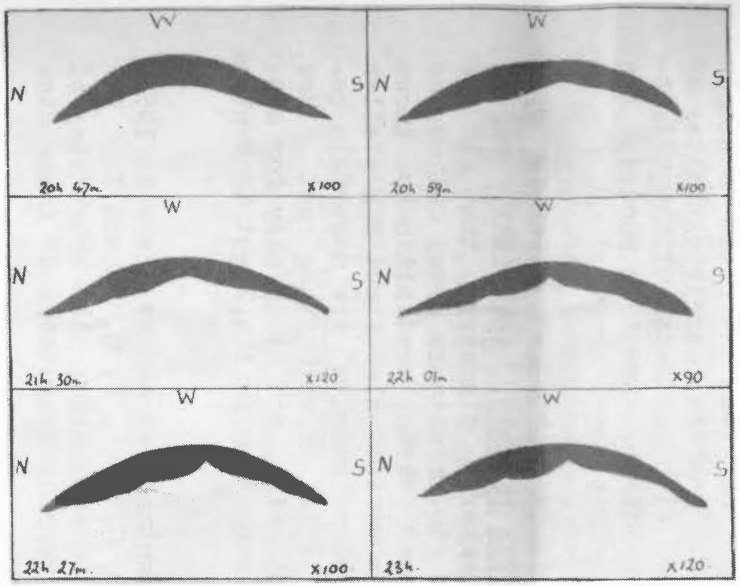


Fig. 1. "Mist-shrouded mountain" observed by R. M. Baum. January 21, 1951.
$20^h\ 47^m$ to $23^h\ 0^m$, U.T. 3-inch refractor.
Colongitude = 77°7 to 78°9.

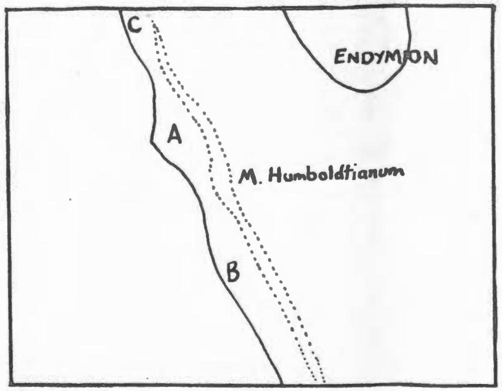


Fig. 2. Position of "mist-shrouded mountain" observed by R.M. Baum on January 21, 1951.

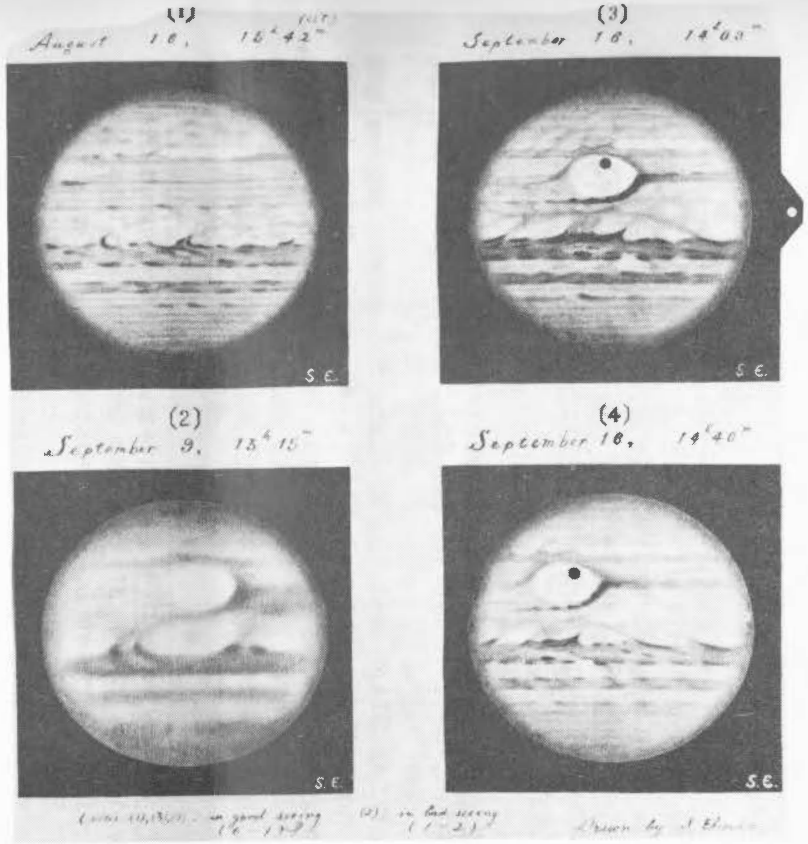


Fig. 3. Drawings of Jupiter in 1950 by S. Ebisawa. 12.5-inch reflector at 250X. (Dates and times by U.T.)

Errata in April Issue. The correct date of Figure 4, on pg. 1 is December 25, 1950, not December 24, 1950. On pg. 9 Mr. David W. Rosebrugh's address should have been given as 70 Waterville St., Waterbury 10, Conn. On pg. 10 Mr. G. D. Roth's address should have been given as Privatsternwarte, Muenchen 9, Lengmoosstrasse 6, U. S. Zone, Germany.

Third Convention of Western Amateurs. We have received the following announcement from Mr. Carl W. Dickson, 6951 Mount Vernon St., Lemon Grove, Calif.:

"The Astronomical Society of San Diego and the Amateur Telescope Makers and Astronomical Club wish to announce they will jointly sponsor the Third Annual Convention of the Western Amateur Astronomers. It will be held August 13, 14, and 15, 1951, in San Diego's Balboa Park. A trip to Palomar Observatory is planned. Those interested are invited to write to Carl W. Dickson, Chairman of the Convention Committee."

Internationale Tagung der Planetenbeobachter. (International Convention of Planetary Observers.) This meeting is to be at Munich, Germany, in the summer of 1951 under the chairmanship of Mr. Ernest L. Pfannenschmidt, (20b) Einbeck-Hannover, Grimsehl Strasse 18, British Zone, Germany. It will last four days. Visitors are already expected from Austria, Switzerland, Italy, all German Zones, and Ireland; and any Americans then in Europe will be welcome. Those desiring further information should write to Mr. Pfannenschmidt, who is the Director of the Planet Section of the Bund der Sternfreunde (Association of Amateurs). At the kind invitation of the Bund der Sternfreunde the Association of Lunar and Planetary Observers will have an exhibit at this Munich convention.

OBSERVATIONS OF THE BRIGHTNESS OF NEPTUNE

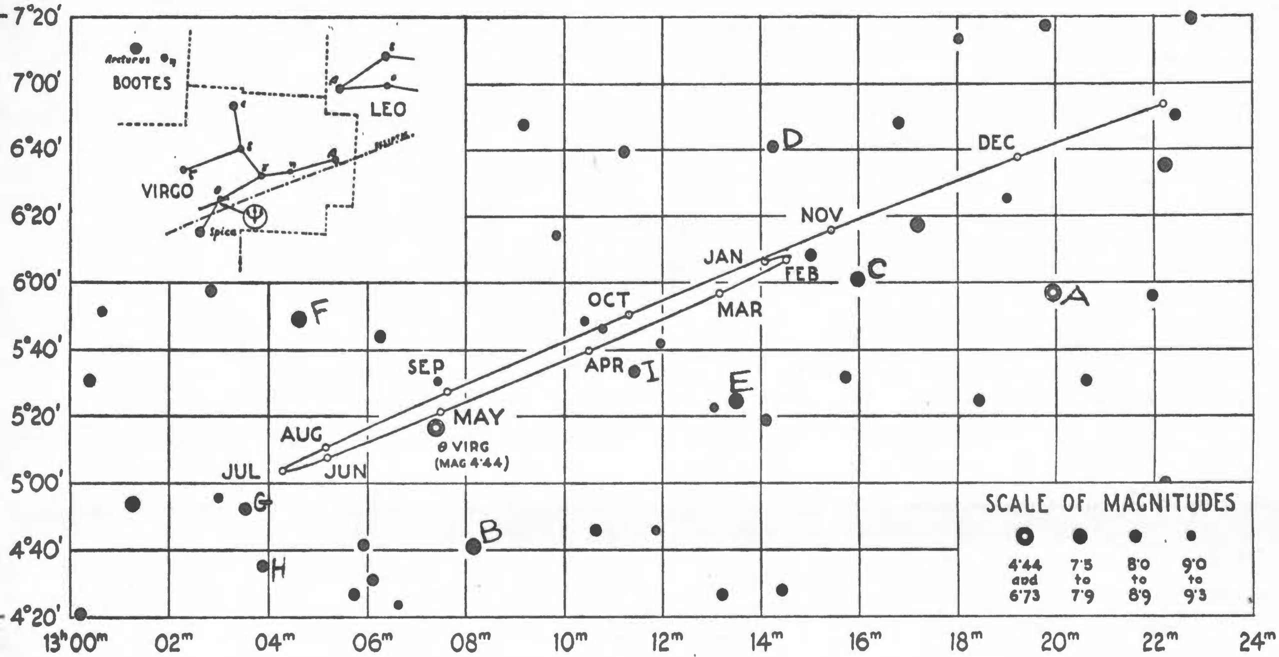
by Walter H. Haas

In the February, 1951, Strolling Astronomer there was described a simple but important observational project for A.L.P.O. members, namely estimates of the brightness of Uranus. This article will deal with estimates of the brightness of Neptune. Though only the most modest optical equipment is needed, the results obtainable are of value to professional astronomers.

Readers might like to refer here to Dr. Joseph Ashbrook's article, "The Meteorology of Other Planets," in The Scientific Monthly, Vol. LXIX, No. 4, October, 1949. The article describes Dr. W. Becker's discovery that all the outer planets undergo slow year-to-year changes in brightness after allowance is made for phase, changing distance from sun and earth, and all other known factors. With Neptune Becker found evidence of a variation of about 0.4 stellar magnitudes in a period of about 21 years, but these results are uncertain because of the limited amount of observational material on which they rest. New observations of Neptune are hence especially worthwhile, and it is easy for amateurs to make them. The cause of the indicated variation in the light of Neptune is not known.

The chart on pg. 3 indicates the path of Neptune among the stars in 1951. On the chart are marked comparison stars A, B, C, D, E, F, G, H, and I. No other stars besides these nine should be used in estimating the brightness of the planet. It is possible that the order of decreasing brightness of these nine

PATH OF NEPTUNE, 1951



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stars is not the order of the letters; for example D may be found to be brighter than G, or H brighter than F or G. Such possible discrepancies should cause the observer no alarm. In the method to be used on Neptune it is not in the least necessary to know the stellar magnitudes of the comparison stars while making the estimates; what is necessary is to make careful and independent estimates. As a rough guide, however, the stellar magnitude of Neptune is usually near 7.7 or 7.8

For observations of Neptune a 7 x 50 binocular is excellent; a 2-inch telescope, good; and a wide-field finder, probably adequate. It is important to have Neptune and the comparison stars in the same field of view. After the planet has been found, select some two comparison stars from the nine on the chart on pg. 3, one star being a little brighter than Neptune and the other a little fainter. Then estimate the brightness of Neptune on a scale of zero to ten, where zero represents the brightness of the brighter comparison star and ten that of the dimmer one. All participating observers must use this scale for their estimates in order to make the data uniform. Actually, the scale is easy to use. For example, an estimate of A 5 N 5 B would mean that the brightness of Neptune was exactly midway between that of stars A and B, A being the brighter of the pair. The estimate A 1 N 9 B would mean that Neptune was very slightly dimmer than A, and A 10 N 0 B would indicate equality with B. On each night of observation, compare the planet with several different pairs of stars, if possible. It will be sufficient if each observer participating in this project will estimate the brightness of the planet on about eight or ten nights in all. Of course, all principles and techniques of variable star work apply to this project upon Neptune. It will be best not to observe when there is twilight, moonlight, or haze. The line joining the observer's two eyes should maintain a constant direction relative to the field of stars.

Having been at opposition on April 8, Neptune will be well placed in the evening sky during May, June, and part of July. At the end of the current apparition (hence in July or August, 1951) all observations should be reported to Walter H. Haas, 133 S. Alameda St., Las Cruces, New Mexico on a form which I shall supply. This form will be mailed free of charge to all who write for it. Arrangements have been made for the reduction and discussion of these observations with Dr. Joseph Ashbrook, Yale University Observatory, New Haven 11, Conn. Now let us all see that he has some observations to reduce and discuss!

ON THE SPANISH METEORITES

by Anthony Paluzíe-Borrell

(Foreword. It is a great pleasure to introduce, as a new contributor to these pages, Mr. Anthony Paluzíe-Borrell, Diputacion 337, Barcelona, Spain. Mr. Paluzíe is Librarian of the Sociedad Astronómica de España y América (Astronomical Society of Spain and America). A devotee of astronomy from his youth, he also belongs to the Sociedad Astronómica de Barcelona, the British Astronomical Association, the Société Astronomique de France, and the A.L.P.O. Mr. Paluzíe's active interest in lunar matters and especially in lunar maps has been fittingly recognized through the naming of a large lunar walled plain for him(The Strolling Astronomer, Vol. 4, No. 7, pg. 13, upon Section 13 of the charts, 1950). Our Spanish friend is a regular contributor to the magazine Urania on many subjects of interest to astronomers. Mr. Paluzíe reads and writes English and will welcome correspondence from A.L.P.O. members.)

In Spain recorded meteoritical history began seven centuries before recorded cometary history. The most ancient "hairy star" observed there, of which we have a record, was in the year 1664. It was observed by the Majorcan sailing-master Vincent Mut, whose Latinized name Mutus appears on Riccioli's lunar chart as the name of a crater. Comets were doubtless seen in years prior to 1664 in Spain, but they were not scientifically studied. Two examples are a comet observed on June 14, 1459, by the public notary of the municipal authorities of Barcelona and a comet seen in 1464 by another Barcelonian notary. The most ancient known fall of a meteorite is in the year 939, the only one in the first millenium. Four other falls are on record up to 1700, and among them is a bolide. During the eighteenth century there were recorded two more falls and one fireball. During the twentieth century so far 19 meteorites have been collected, and many fireballs have been seen; five additional meteorites have fallen but have not been recovered. In the period 1900-1935 five meteorites were collected, and another ten fell and were lost. The writer knows of no new falls since 1935. The meteorites of Spain are modest in size, the largest weighing 331 poinds (150 kilograms). Perhaps the picturesque history of some of them can excuse their smallness.

The first meteorite, in the year 939, is known because it is mentioned in the "Cronicón Burgense". Here "Cronicón" is a small or brief chronicle, a kind of work which the medieval Spanish historians produced abundantly. In this Burgense brief Chronicle is the following information: "The DCCCCLXXVII, the calends' day of June, at the nones' hour, a flame went out from the sea and fired many cities and villages, and men and beasts, and in the same sea fired rocks, and a suburb in Zamora, and in Carrión, and in Castro Xeriz, and in Burgos a hundred houses, and in Briviesca, and in Calzada and in Pancorvo, and in Belorado and many other villages." In other words, on June 1, 939 (equivalent to 977 of the Spanish Era, which was used for several centuries in Spain) at 15 hours several bolides were seen, some of which set on fire houses and suburbs. Their trajectories must have been very long because the distance between Zamora and Calzada is 162 miles (260 kilometers).

Other falls prior to the seventeenth century were in the years 1300, 1438, and 1520, all mentioned in chronicles. In 1520 in Gandía (province Valencia) fell three stones of a quarter of weight each [sic]. In order to prevent people from taking away fragments from one of them, it was hung up with a chain in a high place in the church.

After nearly two centuries without either fireballs or meteorites we have a fireball seen at Barcelona on December 25, 1704. According to the "Dietari del Antic Consell Barceloní (Daybook of the Ancient Barcelonian Council) at five o' clock in the afternoon a great flame came from the sea; it opened, and three clouds remained in the sky for more than half an hour, after which "there came from the sky a noise like the discharge of many artillery pieces and much musketry, which continued during almost three Creeds."

On September 17, 1773, a meteorite fell at Villanueva de Sigena (province Huesca) between 12 and 13 hours; and, according to an investigation made, it was learned that after three loud noises a stone weighing 9 pounds, 1 ounce fell near two men. The stone was very warm and was so stinking that one of the men held off. When cold, the stone was carried to the curacy. The General Captain of the district, who made the investigation mentioned, leaves for the savants to elucidate whether the phenomenon was an eruption from the ground which fermentation elevated until the time of fall, whether it was some materials elevated by a whirlwind and joined through their mutual attraction, or finally whether a thunderbolt, greater than the normal ones, struck the stone, scorching it and causing its odor.

On May 14, 1861, a meteorite fell at Cañellas (province Barcolqne); and its fragments penetrated so deeply into the ground that only those fallen in hard ground or on rocks could be collected. It was very difficult to persuade the countrymen to part with these stones, for they thought that objects coming from the sky must be of good augury. At Loja (province Grenade) a meteorite was seen to fall in the Sierra Nevada on January 19, 1885. No fragments were located. At Muros de Pravia (province Oviedo) several fragments fell on September 28, 1888, and produced two fires in the forest but were not found. On January 1, 1894, a meteorite fell in the Guadalquivir River in the city of Seville and produced a great wave.

The Madrid fireball of February 10, 1896, was very famous. Its brilliancy was so great that its light was seen from indoors; and when it exploded, walls and doors shook. This fireball was seen over the whole peninsula and especially in Catalonia, above which several fireballs exploded. Nevertheless, there were collected from this bolide only six specimens with a total weight of seven and one-half ounces (210 grams).

On August 24, 1899, a meteorite crossed Spain, entering near Galicia. It was seen in Oporto and Zaragoza and passed over Barcelona. It exploded at a height of 30 miles (50 kilometers) and fell into the Mediterannean Sea, making a water column like a torpedo explosion. Its orbit was calculated by the Barcelonian astronomer Joseph Comas Solá. According to several witnesses, another meteorite fell into the sea in front of Peñíscola (province Castellón) on August 5, 1916. The one of Ciudad-Real on June 30, 1922, fell in the marshes of Vega del Guadiana and was lost to science.

The Olivenza (province Badajoz) meteorite, which fell on July 9, 1924, is the largest mass, 331 pounds, that has fallen in Spain.

On May 15, 1933, a meteorite crossed Catalonia, entering the atmosphere above Toulouse, France, passing over Olot and Mataró, and falling into the sea after travelling a path 180 miles (284 kilometers) long. This fireball was accidentally registered upon a photographic plate by Mr. Comas Solá. This gentleman computed its orbit, its brilliancy (17×10^9 decimal candles), and its mass (3.2×10^6 tons). [This figure for the mass surprised the editor very much. The largest meteorite found to date on the earth's surface has a mass of perhaps 70 tons, only 0.002% of the figure given above! However, Mr. Paluzíe verified in a letter on February 6, 1951, that Mr. Comas Solá's published value is indeed 3.2×10^6 (3,200,000) tons. The underlying premises of the computation were that the height of the fireball was 100 kilometers, that the visual magnitude of the full moon is -11.3, that the surface brightness of the fireball was that of the metal platinum, and that the fireball was spherical. The image of the fireball on the exposed plate was compared to that produced by the full moon in order to determine the visual magnitude of the fireball. It still appears to the editor that the resulting mass is far too large to be accepted. Perhaps the light for the image on the photographic plate came almost wholly from a large, luminous shell of air enveloping the meteorite, not from the solid meteorite itself.]

At La Rinconeda (province Sevilla) on July 17, 1935, a meteorite fell on a hut and set it afire. The hut was occupied by two men, who ran out when they heard the noise. The blast of air pressure threw them to the ground. No fragments of this meteorite were recovered.

Though not connected with meteorites, there can be reported as a curiosity an observation made by my friend, Mr. Joseph Pratdesaba, an amateur astronomer at Vich, near Barcelona, who has a beautiful observatory. When observing the star Vega in his transit instrument on November 15, 1917, at 14 hrs., 40 mins., U.T., he saw a fireball, shining like Venus, cross the telescopic field of view.

The display of shooting stars on October 9, 1933, which was observed by many people, was predicted as possible in several astronomical journals. However, these predictions were not known to the astronomer Comas Solá, who computed the orbit of these meteors and found it to coincide with that of the Giacobini-Zinner Comet.

A comic note is the history of a meteoritic iron that was exhibited by our astronomical society. It was collected on the seashore of San Carlos de la Rábida (province Tarragona). It weighed 110 pounds (50 kilograms). Analysis gave a composition similar to minerals from the Ojos Negors (Black Eyes) mine in the province Teruel. Upon investigation it was learned that a French frigantine was stranded on the shore there by a storm in the year 1870. When newly floated, the vessel reembarked with most of the iron ore that it carried but left behind about five tons of ore. The "famous" meteorite was from this mineral and was "discovered" in the year 1916.

In the Natural Sciences Museum at Madrid are fragments (about 100 stony and about 50 ferrous) of all meteorites which have fallen in Spain except the one of

Berlangas de Roa (province Burgos) on July 8, 1811. It is supposed that the Napoleonic General Dorsenne seized it and gave it to the Natural History Museum of Paris. Some fragments of many of the Spanish falls are in the specialized museums of London, Paris, Berline, Vienna, Budapest, etc. In America the U. S. National Museum at Washington and the Ward Coonley Collection at Chicago have several fragments of Spanish meteorites.

Before closing I want to express my thanks to Mr. Walter H. Haas for giving a place to these lines in one of the most interesting astronomical periodicals in the world: The Strolling Astronomer. The Council of the Astronomical Society of Spain and America at Barcelona joins with me in sending best wishes for their active and sympathetic colleague, the A.L.P.O.

BOOK REVIEW

by E. Downey Funck

Greenhouse World by Donald Lee Cyr. Published by Donald Lee Cyr, 1412 Palm Terrace, Pasadena 6, California, 1950. 52 pages, illustrated. Prices at $1.00 per copy.

Before beginning a review of Mr. Cyr's latest booklet, the reviewer thinks that a brief resumé of two companion books, Saturn Has Rings and The Last Ice Age, would benefit the reader. Mr. Cyr explains the "snowy white" brightness of Saturn's rings by suggesting that the rings may consist of ice crystals and thus may be similar to our own cirrus clouds. The rings were formed by condensation from the original atmosphere of the planet. Saturn's cloud belts are explained as consisting of fallen ring particles rotating as a canopy at the edge of the planet's atmosphere. The cloud belts of Jupiter, Uranus, and Neptune were formed similarly through the precipitation of particles from past ring systems. The earth at one time in its history was surrounded by a cloud canopy. The precipitation of the canopy upon the earth's surface during the Pleistocene era in the latitudes of 50 to 70 degrees would account for evidence of glaciation found in these zones.

Greenhouse World investigates this annular theory in connection with the earth's climatic history. Geological evidence supporting the canopy theory is discussed in great detail and is traced back to Huronian (pre-Cambrian) times. The migration of plant species to widely separated parts of the world is explained as the result of the regular succession of climatic zones caused by a decrease in the height of the cloud canopy. Since the collapse of a cloud canopy would cause an increase in the quantity of water upon the earth's surface, the booklet points to the existence of numerous submerged guyots in the Pacific as evidence in favor of the canopy theory.

Mr. Cyr has an entertaining style of writing and apparently has read widely. He appears to have a talent for combining concepts in different branches of science. However, the reviewer finds that he does not always possess as sound a knowledge of his subject as he should, which is especially true in the field of astronomy.

It is thought that the members of the A.L.P.O. will find Mr. Cyr's theories interesting and thought-provoking.

Postscript by Editor. A descriptive advertisement of three of Mr. Cyr's interesting and entertaining booklets appeared on the back inside cover of the November, 1950, Strolling Astronomer. Author Cyr is, by the way, a member of the A.L.P.O.

Mr. E. Downey Funck, 256 N. E. 11th St., Delray Beach, Florida suggests that book reviews might well be made a regular feature of The Strolling Astronomer. The books reviewed would presumably be ones dealing with lunar and planetary astronomy and closely related fields. Of course, opinions expressed would be those of the reviewers. Mr. Funck and the editor would be glad to hear from our readers what their reactions are to this idea.

We thank Mr. Funck for the review here published.

OBSERVATION AND COMMENTS

Since we last reported A.L.P.O. studies of the lunar crater Conon new material has arrived from S. Ebisawa (6-inch refl.), E. E. Hare (12-inch refl.), L. T. Johnson (10-inch refl.), and E. J. Reese (6-inch refl.). The nomenclature used here is that of Mr. Reese's map of Conon, which was reproduced on pg. 1 of our February, 1950 issue. Reference might also be made to a drawing of Conon by Reese on pg. 1 of the May, 1950, issue and to two drawings by Ebisawa on pg. 1 of the February, 1951, issue. The term colongitude used here is the lunar eastern longitude of the sunrise terminator at the equator. It measures the solar illumination of the moon. The observations of Conon mentioned below were all made in 1950.

In excellent to good seeing on October 2 at colongitude 161°.5 Hare took advantage of the late afternoon lighting to study certain topographical features. He noted a crater or divide at the north end of Cleft V (also observed on November 21). A dark line marking the western circumference of the floor of Conon suggested a down-slope on the west inner wall before it joined the floor. A small black spot on this line might have been either a crater or the shadow of area O (if O is a mound or promontory). Hare suggests that it would be interesting and instructive to watch the full sequence of the advance of the sunset shadow across the floor of Conon; of course, such a project would require observing over several months. Fault (ridge or ledge?) B was much the most conspicuous dark streak on the floor between colongitudes 20° and 40°. This feature was black, continuous, and prominent. On January 29 at colongitude 37°.0 Reese found B quite as dark, although a little narrower, in its northeast part as in its southwest part. (L. T. Johnson has sometimes found the northeast part much the less dark and the less conspicuous. The Strolling Astronomer, Volume 4, No. 4, pg. 8, and No. 7, pg. 7, 1950.)

With his excellent 12-inch reflector Hare finds that Streak S is seen better in poor seeing than in good; as the view improves, S becomes indefinite, diffuse, and discontinuous, there then being a break where S crosses cleft V. Attentive readers will note at once that this behavior is precisely what Antoniadi and his followers have contended to be true of the canals of Mars. Hare hence pertinently proposes that S, since it is easier to resolve than the canals, may well give observers and theoreticians an important key to the true nature of the canals. The evidence will naturally be more convincing if observers of both the Lowellian and Antoniadian schools find S to grow diffuse and broken in larger telescopes and in good seeing. The clearness of the view should be judged by known detail, not S. Unhappily, Ebisawa appears to disagree already! He finds the detail in Conon very diffuse and splotchy-looking in poor seeing and thinks that it might become Lowellian, sharp and geometric, in good seeing, though he has not yet had an opportunity to observe Conon in excellent air. Reese offers these comments on Hare's proposal: "But what is the nature of streak S? Is the streak subject to real variations in intensity? Even an observer as skillful as Hare is not at all consistent in his description of the conspicuousness of the streak. Sometimes he describes it as very easy and very real, while at other times he practically denies its existence."

Indeed, Reese's prolonged and very careful series of observations continues to give examples of surprising differences in appearance of various features under very similar solar lighting. On January 28 at colongitude 22°8 he saw cleft V clearly;its west wall was black as shadow, and its east wall was brighter than the floor. Streak S was only suspected. On November 19 at 21°5, however, Reese found S very dark and narrow and cleft V very difficult, dusky but not dark. Conditions for observing were somewhat less good on November 19 than on January 28. Conon was observed by two other persons soon after November 19, by Ebisawa on November 20 at 39°2 and by Hare on November 21 at 46°6. Ebisawa found S difficult and V almost invisible. Hare made S plainly visible and V visible only in the better moments, the seeing being poor.

Mr. R. M. Baum of Chester, England, who is one of the most active members of the Lunar Section of the British Astronomical Association, upon February 4, 1951, reported a very interesting series of observations of a mountain on the northwest limb of the moon. His series of drawings of this "mist-shrouded mountain" appears as Figure 1 on pg. 1, and the position of the mountain is indicated on Figure 2 on pg. 1. The fainter shadings on the original drawings may be hard to see on these reproductions. We can perhaps do no better than to quote Mr. Baum's own account of his observations:

"Upon the evening of January 21 this year, while I was engaged upon an observation of the Humboldt Mountains on the northwest limb, a curious and rather stimulating appearance was observed due west of Endymion. Here a rather lofty elevation was detected, around which over a period of 2 hrs., 13 mins. some rather curious changes were seen to occur.

"When first observed this mountain appeared as a rounded mass of great height and of a uniform brightness. This first observation was made at $20^h 47^m$, U.T. At $20^h 59^m$, when checking my sketch of the area, I was surprised to see that since my first view a rather startling change had taken place, both in shape and tint of the mountain. Instead of a rounded mass a somewhat flattened conical shape had appeared, while on the north slope a smaller peak had made its debut. To the south the gentle concave slope had disappeared, and its place had been taken by a slightly convex white mass. East of the summit a nebulous white spot lay upon a grayish background, while to the south a curious streakiness of the southern white mass was observed. Having observed this change, I began to have doubts as to the accuracy of my original sketch at $20^h 47^m$ and so resolved to take a third sketch to satisfy myself.

"However, at $21^h 30^m$ I was truly surprised to observe that another curious transformation had taken place. The southern white mass had slipped farther down the slope on the south;and the nebulous white mass to the east had enlarged, while north of this another, foreshortened, or so it seemed, white area had appeared. Again at 22^h the appearance was not the same as before. The summit had become sharply defined and was no longer 'blurred' as before. A brilliant white area surrounded the summit. To the southeast an elongated 'winding' white streak was detected. The last two views obtained showed that no great perceptible changes took place between 22^h and 23^h, after which time clouds formed and spoiled any further observations.

"The foregoing observation was made with a 3-inch object glass [refractor] charged with eyepieces 90X, 100X, and 120X, the use of which depended on seeing conditions at the time of observation."

In explanation of these remarkable appearances Mr. Baum comments: "I find that only the possibility of some form of [lunar] mist explains the transformation which took place in a little over two hours." Indeed, if one can grant a lunar atmosphere capable of forming obscuring mists, this explanation would certainly appear to be the most natural one. The conditions of observation apparently did not fluctuate much since Mr. Baum considers that they only changed the most effective magnification from 90X to 120X as extreme values. Perhaps a sharp, conical peak might seem more or less rounded in poor seeing. The powers used by Baum in his different drawings, however, give no evidence that the seeing was worse when the peak looked rounded from 20^h 47^m to 21^h 30^m, U.T., than when it looked sharp from 22^h to 23^h. These remarks also apply to the smaller peak on the northern slope. We might note that the colongitude (defined above) ranged from 77°.7 at 20^h 47^m to 78°.9 at 23^h 0^m on January 21, 1951. Incidentally, the moon was full at 4^h 47^m on January 23, about 30 hours after Baum's last observation. At the time of his study here described the earth's selenographic longitude was 2°.7 east, and its selenographic latitude was 6°.0 south. Since the sun's elevation above the horizon at the peak was about eight degrees, shadows can scarcely have been shifting rapidly enough to account for the rapidly variable gray shadings recorded by Baum.

If lunar mists shrouded this peak on January 21, it is not impossible that they may be reobservable in the future. Of course, if the mists are present over only a brief interval of colongitude, then it will be only at long intervals that the necessary combination of solar illumination and libration will occur. Nevertheless, searching near colongitude 78° at favorable librations can do no harm. The peak will be seen best when the libration in longitude has large positive (western) values and will be invisible behind the limb at large negative values. Figure 2 on pg. 1 may help in locating and identifying the peak.

We have had considerable correspondence about Maedler's Square with D. P. Barcroft of Madera, Calif. Dr. J. C. Bartlett discussed this lunar feature in our December, 1950, issue. Mr. Barcroft feels confident that he has succeeded in reobserving the Square and the Cross described by Maedler and Neison. When the evidence has been sifted further and when certain inquiries now in progress are complete, we hope to present a sequel to Dr. Bartlett's article on what is, at the very least, an intriguing lunar riddle.

Observations of a curious radiance of the limb of the earthlit hemisphere of the moon by T. Saheki, S. Murayama, J. C. Bartlett, Jr., and W. H. Haas were reported in The Strolling Astronomer, Vol. 4, No. 4, pg. 7, No. 5, pg. 10, No. 7, pg. 7, and No. 10, pp. 8-9, 1950. Dr. Bartlett resumed these observations on March 9, 10, and 11, 1951. Using a 3.5-inch reflector at 60X he attempted to establish the color of the east limb (moon new on March 7) with Wratten commercial color filters. His results on the three dates were flatly self-contradictory, however;and it is uncertain whether the limb was more yellow or more green (or blue) than the interior lunar highlands. On these occasions Bartlett found the earthlit limb about equally bright all around, although both he and Japanese observers sometimes noted brighter arcs in 1950. It may be that the determination of the color of this limb-light is a job for careful photography with fairly large telescopes and, of course, standard color filters. Mr. Sadao Murayama is proposing to carry out such a program. He has kindly sent a photographic print of the crescentic moon taken with a star camera attached to the 8-inch refractor of the National Science Museum at Tokyo, Japan (and without filters?). The camera had an aperture of 4 inches and a focal length of 20 inches. The diameter of the moon has been enlarged on the print from 1/5 of an inch to 11/16 of an inch. The photograph was made on February 8, 1951, at 9^h, U.T., thus when the age of the moon was 2 days, 1 hour. The earthlit hemisphere is shown very clearly, though any brightening of the limb is uncertain on the print.

In August-October, 1950, E. E. Hare carried out both visual and photographic studies of the lunar walled plain Bailly with his excellent 12-inch reflector. His eventual goal is to make enlargements from the photographs for use as forms in drawing in the finer detail, the features recordable only visually. Hare has drawn fully 115 craterlets in Bailly in good seeing, several times as many as are present on the Wilkins map, and 35 more around it.

A drawing by D. O'Toole of the lunar crater Cassini on March 19, 1951, at colongitude 42°.4 is of interest in connection with F. E. Brinckman's studies of Cassini (pg. 14 of April issue). Using a 6-inch reflector at 350X, O'Toole suspected, but was not certain, of dusky bands on the walls of Cassini A. His drawing shows an elevation in the west part of the floor of A and may also show Brinckman's cleft on the southeast inner wall, continuous and unbroken on this occasion. A black arc of exterior shadow indicated some kind of lip on the southwest outer wall of A, an aspect O'Toole had not noticed before under lower lighting. O'Toole has often seen two small hills between A and B, the chief craters on the floor of Cassini.

We are pleased to note increasing interest in several quarters in systematic, cooperative surveys of the earthlit hemisphere of the moon for possible lunar meteors and/or meteoritic impact-flares. S. Murayama wrote in part as follows on March 1: "We planned cooperative observations of lunar meteors last year, and about a dozen observers joined in the project. Dr. Yamamoto, Kibe, Saheki,and I are directing the cooperation and are now arranging the results obtained. Our purpose is to obtain simultaneous records of the same lunar meteor by different observers. However, we have not yet obtained such results, although several suspected meteors have been recorded since last summer." Mr. Lyle T. Johnson, Box 187, La Plata, Maryland has reported his searches for possible lunar meteors on December 13-14, 1950, and on January 11-12, January 13, March 11, March 12, and March 13, 1951. He used a 10-inch reflector at 179X or 221X and examined a lunar region having an area of about 1,000,000 square miles and centering around Grimaldi. This region is as far as possible from the sunlit crescent, Grimaldi is an easy feature to focus attention upon, and near the lunar limb a larger volume of the possible lunar atmosphere is surveyed with a given eyepiece of moderately high power. On the six dates mentioned Mr. Johnson spent a total time of 9 hrs., 57 mines. in watching the region selected. Results were negative, except that he did <u>suspect</u> two "faint flashes" on or very near the east limb a little south of Grimaldi; one of these was remarked at $0^h 43^m$ on January 13, and the other was noted at $1^h 35^m 50^s$ on March 13 (U.T.,as usual). Johnson is suspicious of the fact that he has now suspected three flashes near the very same position on the lunar disc. Mr. Johnson again invites amateur astronomers living near the East Coast to cooperate with him in planned, simultaneous searches for lunar meteors. Those in the Midwest should instead contact Mr. F. A. Keysor, 415 N. Ashland Ave., La Grange Park, Illinois. Mr. Keysor is carefully organizing lunar meteor searches in his geographical region. He will furnish full instructions to all who write him for them. Unlike many A.L.P.O. projects, lunar meteor searches can be carried on with a telescope of very mediocre optical quality. Large apertures here naturally have a great advantage, but even a 6-inch can be used to good purpose.

D. O'Toole observed the remote Mars on March 12 when its angular diameter was only 4".0. At ⊙292° in the southern summer the south polar cap was seen rather easily, and a north cap was suspected. Measures of the drawing gave approximate diameters of 70° for the south cap and 50° for the suspected north cap. With a central meridian of <u>about</u> 262° Casius-Utopia, Mare Cimmerium (intense), and the west shore of Syrtis Major are readily identified on the drawing. O'Toole observed with a 6-inch reflector at 185X in fair seeing.

Figure 3 on pg. 1 shows four drawings of Jupiter in 1950 by Mr. Shirō Ebisawa at Tokyo, Japan. The central meridians are as follows:

Drawing	C.M. (I)	C.M. (II)
(1)	259°	322°
(2)	2	242
(3)	61	247
(4)	80	266

Drawings (2), (3), and (4) show the Red Spot Hollow well-placed on the disc, and drawings (3) and (4) show a Red Spot of irregular structure faintly present inside the Hollow. The black spot projected on the Hollow in drawings (3) and (4) is the shadow of satellite IV. Mr. Ebisawa directs attention to the difference between drawing (2) in bad seeing and drawings (1), (3), and (4) in good seeing. Using a 12.5-inch telescope, he found: "The detail on the Jovian surface became finer and more complicated, or 'Lowellian', to me in good seeing, as in drawings (1), (3), and (4). In poor seeing, on the contrary, it became more indefinite and 'Antoniadian' to me, as on drawing (2)." The four drawings of Figure 3 well illustrate this argument, and Ebisawa certainly recorded a <u>great</u> amount of fine Jovian detail in the three good views. E. E. Hare, the Jupiter Recorder, has pointed out that on August 16 the South Equatorial Belt North should be very prominent left of the C.M. on drawing (1) and that on September 16 a broad dark column across the South Temperate Zone at 292° (II), which was recorded plainly on photographs, is surprisingly missing from drawings (3) and (4). In a somewhat similar way at least one famous planetary observer of recent years was accused of omitting relatively gross features from a drawing, with a large telescope, that depicted much very fine detail. Perhaps it is very difficult for the visual observer to fail to overlook some features.

During the last month observations of Saturn have been made by J. C. Bartlett, Jr. (3.5-inch refl.), T. R. Cave, Jr. (12-inch refl.), L. T. Johnson (10-inch refl.), P. J. Nemecek (10-inch refl.), T. Osawa (6-inch refl.), E.J. Reese (6-inch refl.), and C. Tarwater (Cave's 12-inch refl.). Dr. Bartlett made the majority of the observations. This energetic observer examined Saturn 27 times on 17 dates from March 6 to April 1, inclusive - surely a praiseworthy accomplishment. He often draws the planet in its natural colors. In the text below we shall call the main low-latitude southern belt the South Equatorial Belt and the main low-latitude northern belt the North Temperate Belt, even though their numerical latitudes are similar. We shall call the bright space between the S.E.B. and the projected rings the Equatorial Zone, and we shall call the bright space between the N.T.B. and the projected rings the North Tropical Zone. We might repeat here what can be seen from L. T. Johnson's graphs on pg. 5. of the April issue: the shadow of the rings lay north of the projected rings before March 16 and south of them after that date. At least three A.L.P.O. observers drew the shadow on the wrong side early in the 1950-51 apparition, an easy mistake.

The South Polar Region was dusky; sometimes, in fact, the ball was drawn uniformly dusky from the South Equatorial Belt to the south limb. Bartlett was closely attentive to the intensity of the zones between the S.E.B. and the S.P.R. He found these to increase in duskiness from March 6 to March 10, then to brighten from March 11 to March 16. They were more dusky again from March 17 to 21 and brighter again from March 23 to April 1. Is there a periodical variation repeated every 10 to 15 days? Bartlett remarks:

1. The varying duskiness of zones must necessarily affect the visibility of neighboring belts, especially in small telescopes. For example, the S.E.B. will seem more prominent when bounded by a bright zone to its south then when bounded by a dusky one.

2. After allowing for this effect, the S.E.B. and the S.P.R. were probably actually darker in some longitudes than in others during March.

3. This circumstance and the well-known similar composition of belts on Jupiter would suggest a fundamental similarity in the origin and mode of belt-formation on the two planets.

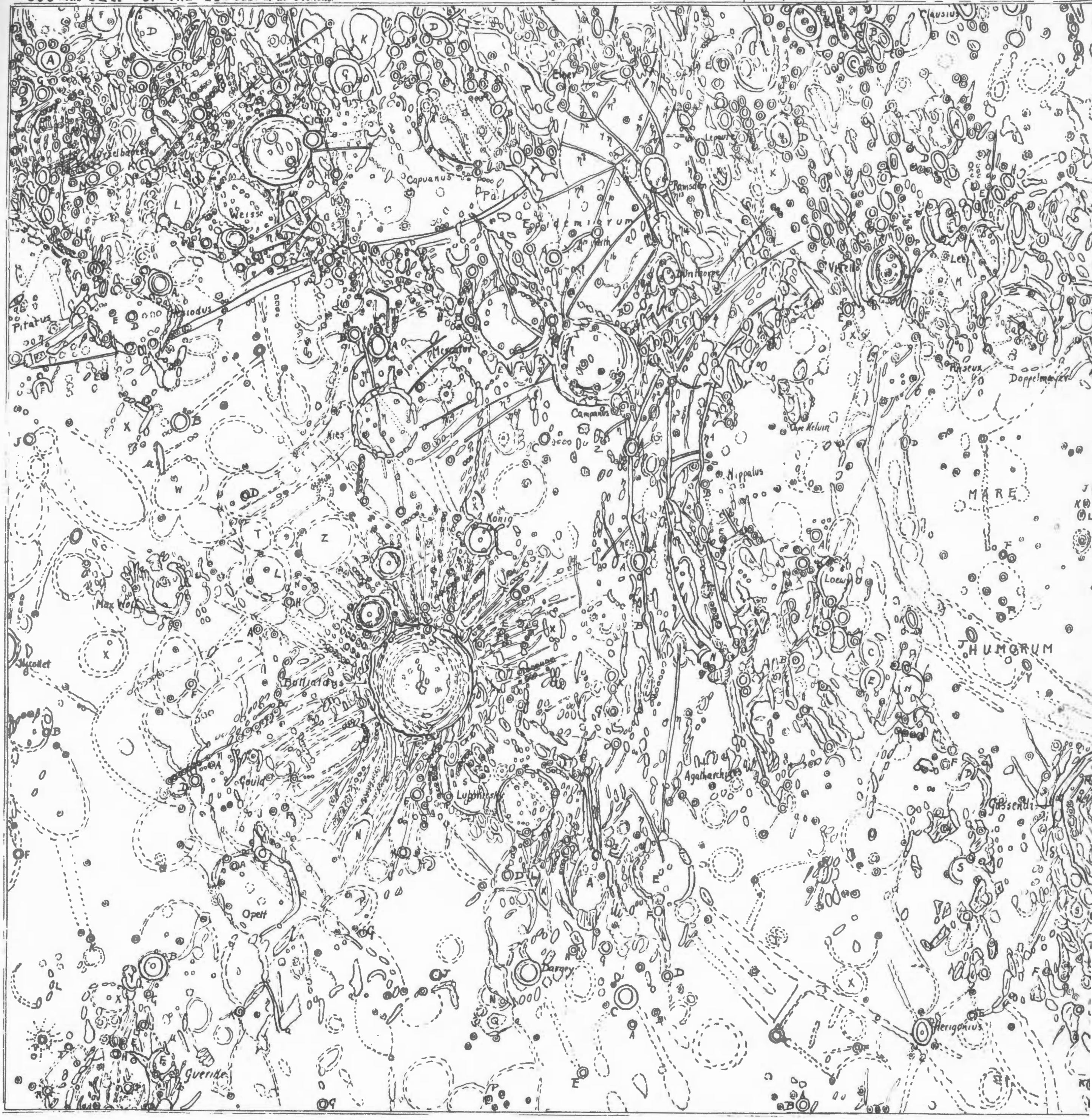
Reese on March 12 and Osawa on March 2 and 20 show a rather dull and narrow South Tropical Zone just south of the S.E.B. To its south they depict an undistinguished South Temperate Belt, which Bartlett has recorded twice. Bartlett found the southern hemisphere of Saturn distinctly darker than the northern hemisphere throughout March. The S.E.B. was the second most conspicuous belt on the planet. It consisted of two components, which were probably more difficult to resolve on some dates than on others. In this belt were darker sections, wider sections, humps, darker spots, etc.; but all this structure was difficult to observe. Bartlett occasionally remarked a wavy south edge. The combined Equatorial Zone - North Tropical Zone was brilliant, much the brightest part of the ball. The doubled North Temperate Belt was the most conspicuous belt, being seomtimes notably darker than the South Equatorial Belt. Its internal structure resembled that of the S.E.B. but was difficult to observe. Bartlett frequently noticed the south edge of the N.T.B. to be wavy. The space between the components was dusky. A diffuse, wide, and undistinguished North North Temperate Belt was sometimes visible in high northern latitudes and may even have been narrow and intensely dark to Osawa in fairly good seeing on March 20. In fairly good seeing on March 23 and 27 Bartlett caught glimpses of an intricate lacework of dusky festoons in the North Temperate Zone, between the N.T.B. and the N.N.T.B. Something of this effect may be present in Osawa's drawing of March 20. Perhaps it affected only certain longitudes of the zone. Osawa, Bartlett, and Reese may have seen one or two additional far northern belts. There was usually a darker North Polar Region. Bartlett's observations suggest variations here in a period of 10 or 12 days; he found the north limb light and unshaded near March 8, 17, and 30 but noted a very dark north cap near March 10 and 19. In a good view on March 7 Cave thought detail on Saturn faint and less contrasty than in the 1949-50 apparition.

Although Nemecek, Johnson, Osawa, and Bartlett all caught glimpses of fine detail on the ball, chiefly in the S.E.B. or the N.T.B., we have records of exactly <u>one</u> central meridian transit of a Saturnian feature to date. We must emphasize again the importance of making every effort to obtain central meridian transits of all available Saturnian features. Three or four C.M. transits of the same feature are worth <u>many dozens</u> of casual observations of different features. Knowledge of Saturnian rotation-periods is not increased by C.M. transits that were not observed but could have been! About all that can be said of the present data is that some of Bartlett's records <u>may</u> be compatible with a period of <u>about</u> 10.2 hours for the S.E.B. and the N.T.B. (The accepted value in low latitudes, resting on scanty data, is 10 hrs., 14 mins.)

On January 6 Johnson noted that the rings were dull; and on February 13 he thought them slightly darker than the limb of Saturn, but they contrasted very little with the globe. On March 12 Reese found the rings brighter than the ball. The projected rings were certainly difficult to distinguish against the E. Z.-N. Tr. Z. in March. The rings would be expected to brighten as the Saturnicentric latitude of the sun increased from 1°.6 on January 6 to 2°.6 on March 12. Most of the observers readily saw Cassini's Division near the ansae. Cave, Tarwater, and Osawa have perceived the Crape Ring off the ball in fairly good seeing. Johnson has caught glimpses along the ring-arms of irregularities, which he interprets as gaps or divisions in the three rings; and this explanation probably also applies to two dark bars which Bartlett noted on the west arm of the rings on March 18 in fairly good seeing. With his 6-inch reflector at 230X and fairly good seeing Osawa on March 20 recorded a darker shading in Ring A just outside Cassini's Division. Of course, such fine detail in the rings is best examined when they are more widely opened than now; on March 20 the Saturnicentric latitude of the earth was only 2°.5.

We defer to a future issue discussion of the visibility and appearance of the shadow of the rings on the ball and the shadow of the ball on the rings when they were very narrow in March and April, partly because our records of A.L.P.O. work on this project may then be more complete than at present.

300 inch MAP OF THE MOON. in 25 Sections. S Drawn by H. Percy Wilkins F.R.A.S. 1946. Section VII.



SECTION VII

OF

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

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