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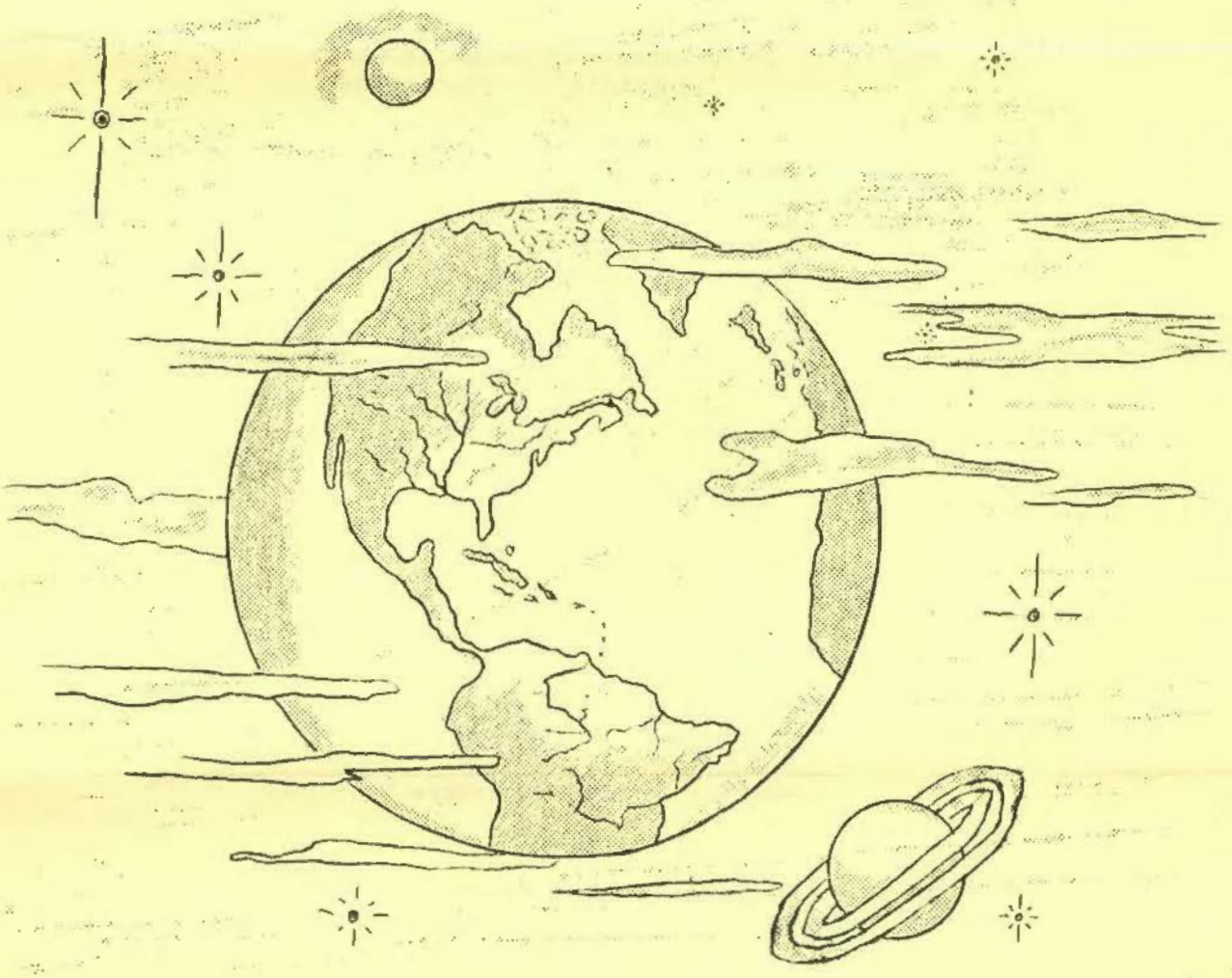

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Foreword by Editor. It is a pleasure to present the following article to our readers; the author, Mr. Ernest Pfannenschmidt, is a leader of planetary observers in post-war Germany. His address is (20 b) Einbeck-Hannover, Grimsehl Strasse 18, British Zone, Germany. We have had frequent occasion in past issues to discuss the contributions of our German colleagues to our common studies. A planetary article by Mr. Pfannenschmidt is a regular and (we are told) popular feature of the magazine Sternenwelt.

Our colleague's subject should appeal to those readers having either no optical equipment or else instruments inadequate for most Martian studies. Through this project they will still be able to participate in the international program on Mars outlined in our October issue. In Germany recent work on Mars of the sort discussed has been carried out by Messrs. Ahnert and Ruegemer. Mr. Pfannenschmidt suggests that when a number of observers are sharing the same telescope, they might very suitably employ the interval between turns at the eyepiece for these naked-eye estimates of the color and brightness of Mars.

ON PHOTOMETRIC AND COLORIMETRIC NAKED-EYE OBSERVATIONS OF MARS

by Ernest Pfannenschmidt

Although visual photometric and colorimetric observations of Uranus and Neptune have, among other things, disclosed and confirmed the rotation periods of both these celestial bodies, few amateurs seem to give earnest attention to this interesting phase of observational astronomy. A good way to rouse permanent interest in such work is to observe Mars at opposition without optical aid and to determine the period of rotation by employing the simple and well known Argelander step-method of visual magnitude estimates. With sufficient closely-grouped data at hand it is quite easy to draw a photometric graph which will not only disclose the period of rotation but will also correspond closely to a photometric surface-map of the planet. It is thus actually possible to construct a crude photometric map of Mars based on naked-eye observations only-surely an interesting and instructive paradox.

The method was probably first applied by the well known late Danish planetary and variable star observer H. E. Lau (see B.S.A.F., Sept. Nov., 1914). Lau hit upon the idea when hearing Prof. Guthnick's initial photoelectric cell investigations of Mars (see Verofftl. Berlin-Babelsberg I, 1, pg. 54) and immediately decided to attempt visual estimates. The photometric intensity of Mars is strongly variable because of the unequal distribution of bright and dark surface markings generally called "continents" and "Maria". An easily detectable period of approximately $24^h\ 37^m$ is due to the planet's rotation, whereas non-periodic fluctuations result from the corresponding tilts of the planet's northern or southern pole to or from the earth at various oppositions and/or from large scale Martian meteorological phenomena such as the veiling of otherwise dark areas thru bright cloud masses. Typical examples of the latter kind prevailed during the 1901 and 1922 oppositions at Lacus Solis, Mare Sirenum, Pyrrhea Regio, and Tempe. The independent observations or confirmation of such phenomena by naked-eye estimates may well reveal data of scientific value. The foregoing, of course, applies also to colorimetric studies.

At perihelion oppositions, when the southern Martian hemisphere is tilted towards the earth, the area of light-reducing dark surface markings on the disc

at a specific time may amount to as much as 30% of the total disc area, producing a very definite and easily detectable reduction in apparent celestial magnitude. H. E. Lau used Capella, Procyon, and Regulus as comparison stars; and his observations compared very well with those of Prof. Guthnick, who found the photo-electric minimum of intensity at an areographical longitude of 6° and the corresponding maximum at 117°. Lau estimated the visual minimum at 300° (Syrtis Major) and the maximum at 121° (Arcadia-Tharis, Memnonia). The observers agree still better on the amplitude, Guthnick giving $0^m.18$ and Lau $0^m.17$. These notes will suffice to make clear the efficiency of the visual method just progagated.

A few hints may be of interest to future observers. Wait at least 30 minutes before commencing with observations; only then will your eyes be fully accomodated to the dark. A dark sky is absolutely essential; moonlight or twilight affects the estimates in a varying and uncontrollable manner because bright sky-backgrounds tend to make red stars (Mars) appear relatively brighter and white stars dimmer. To avoid troublesome terrestrial atmospheric absorption, make it a habit to observe the planet near the meridional transit. Comparison stars should have high altitudes (declinations), be non-variable, as close to the planet as possible, and - alas - preferably of red color (spectroscopic groups N or R). However, since almost none of the brighter stars comply with these ideal requirements, others will have to be chosen. Antares, Pollus, Procyon, Capella, and Regulus, among others, will do. The oppositional magnitude of Mars in late March, 1950 will amount to approximately $-1^m.1$. Observers attempting color estimates with filters should use glasses with known absorption values.

AN OPTICAL ILLUSION

by David W. Rosebrugh

In Volume 3, Number 9, page 5, paragraph 3, of The Strolling Astronomer Mr. John J. O'Neill refers to a remarkably variable illumination of that portion of the moon still in the umbra during the lunar eclipse of April 13, 1949.

It is my opinion that such phenomena are caused either by the earth's atmosphere or more probably by our own eyes, though I have no proof to adduce but merely an impression based upon a phenomenon noted at the total eclipse of the sun on August 31, 1932.

It was cloudy at the time of that eclipse in the Province of Quebec where Dr. Fred C. Hamilton of Toronto and I had gone with our wives to see the eclipse.... As it grew darker before the total phase of the eclipse, the darkness seemed to increase in steps. It grew rapidly darker, then seemed to change not at all then rapidly darker again, and then a period of no change. There were, I think, a dozen or more such steps in the period extending from roughly 2 minutes before totality to totality itself. Dr. Hamilton and I both noted this "step" phenomenon and discussed it as it was happening. As I remember it there was no corresponding phenomenon when the sky was brightening after the eclipse was over.

Despite 17 years of occasional mild inquiry among professional and amateur astronomers, I have found no explanation; but I believe it was a phenomenon caused by my own eyes, in my particular case at least.

As Lord Kelvin pointed out, our eyes are very imperfect in many regards.

Postscript by Editor. The preceding article was received in a letter dated October 3. Our correspondent's address is 37 Fern Circle, Waterbury 8, Conn. Perhaps Mr. O'Neill or others would like to discuss further in future issues the question here raised.

VENUS IN AUGUST AND SEPTEMBER

By T. R. Cave, Jr.

The Recorder is very pleased to report a great increase in activity among observers in recent work on the planet Venus. Complete and detailed reports have been received from the following persons:

OBSERVER	STATION	TELESCOPE	REMARKS
F. E. Brinckman, Jr.	Long Beach, Cal.	6"&8" Refls.	Used Cave's 8" once.
T. R. Cave, Jr.	Long Beach, Cal.	6"&8" Refls.	----------
T. Cragg	Los Angeles, Cal.	6" Refl. & 12" Refr.	Used Griffith Refr.
P. Chorley	Vallejo, Cal.	6" Refl.	O'Toole's telescope.
W. H. Haas	Albuquerque, N. M.	6"&8" Refls.	Observed with Cave once.
H. Le Vaux	Los Angeles, Cal.	6" Refl.	----------
D. O'Toole	Vallejo, Cal.	6" Refl.	----------
E. J. Reese	Uniontown, Pa.	6" Refl.	----------
C. B. Stephenson	Chicago, Ill.	6" Refr.	Univ. of Chicago telescope.
E. K. White	Kimberley, B.C., Canada	7½" Refl.	----------

It is rather remarkable that 59 drawings and 65 written observations were submitted by the ten observers, or nearly one drawing per observation, a most excellent record of work done on a poorly placed planet.

THE CUSP-CAPS. The North and South "Polar" Cusp-Caps were normally visible to all observers. In early August the N. Cusp-Cap was easily the more prominent, Stephenson finding it the most prominent feature on the planet in his observation of August 3 (all dates by U.T.). Surprisingly, Reese observed on August 7 and was unable to see any indications of light caps. Near August 10 there is strong evidence to indicate that both Cusp-Caps were of nearly equal size and intensity, this condition lasting until near August 24. However, on August 11 Cragg noted a sudden, but very temporary, lightening of the North Cusp-Cap, lasting probably less than 24 hours. Haas found the two Cusp-Caps nearly equal on August 16, his observation being very well confirmed by all other workers. All observers agree on the redevelopment of the North Cusp-Cap, which became evident about August 25 or 26. On August 24 Stephenson found the Cusps "not intrinsically brighter than the rest of the planet". Cave observed the Cusps to be of equal intensity on

August 26 but found a sudden, though apparently short-lived, brightening of the South Cap on August 27. Brinckman in an excellent view on August 28 noted the North Cap to be the more conspicious but uniquely (in these observations) composed of two concentric zones. White observed the North Cap to be conspicuous in early September; however, on September 5 LeVaux was unable to distinguish either of the Cusp-Caps. During most of September the Cusps were less easy to observe and smaller in area than in August, and usually they were of nearly equal size. Chorley and O'Toole made a number of fine drawings during the second and third weeks of September, noting nearly equal Cusps and on several occasions dark, bordering Cusp-Bands. In early September Haas was unable to observe any south Cusp-Band, a lack confirmed by Cave and LeVaux.

THE TERMINATOR. The terminator or "twilight region" was normally an easy feature to nearly all observers. In early August the still very gibbous planet presented a smooth, even terminator. As the phase slowly decreased, very slight irregularities developed, usually in near-"equatorial" latitudes. (Here "equatorial" is used under the assumption that the poles are near the cusps.) Haas noted an equatorial flattening on several dates in early September and more prominently once near the last of the month. Observing on September 18, O'Toole found a prominent projection a few degrees south of the equator. Brinckman noted a slight indentation at the equator on September 21; reobserving the same appearance the following evening, September 28 [September 22?], Brinckman was struck by a very strong equatorial projection, which one hour later developed into a prominent indentation.

THE LIMB BAND. Haas, Reese, Brinckman, White, Stephenson, and Cave noted this narrow, bright band rather regularly. Although most certainly always well worth recording, the limb band may be a contrast illusion between the bright disk and the sky background.

THE DUSKY DETAILS. These vague, often extensive details might well be regarded as among the most difficult of planetary markings. The shadings with few exceptions appear at the very limit of visual observation. Reese regularly found parallel dark belt streaks; Cragg also often found a very similar appearance and a very persistent equatorial belt. O'Toole noted similar markings on several occasions, but he and Stephenson often drew many large oval or irregular-shaped markings interspersed by many smaller white areas. Haas regularly observed the dark markings to be composed of several streaks, narrow and often not parallel to the planet's equator. Haas noted the southern hemisphere to contain more dusky details than the northern in mid-September. This difference was well confirmed on a number of other dates by Stephenson, LeVaux, Cragg, and O'Toole. Stephenson found under good seeing that the large dusky shadings appeared to break up into smaller components, an effect particularly evident on August 9 and 23. On September 25 Reese wrote: "The disk is definitely mottled; however, the exact appearance of the markings is quite uncertain". Haas, speaking of a rather poor view on September 18, noted: "At times I saw one pattern of markings; at other times, some other pattern". It is evident, therefore, that it is often very difficult to be sure of the objectivity of the very vague dusky details.

THE WHITE AREAS. Cragg calls attention to a white area, apparently stationary, always situated on the limb considerably to the south of the equator. This area is so persistent to Cragg that all observers should attempt confirmation. Drawings now in the hands of the Recorder do not indicate definite confirmation of this area with any degree of certainty; however, Haas may well have seen it on September 24-25 (U. T. date changed) and Stephenson on August 10.

COMPARISON OF DRAWINGS. The Recorder has attempted whenever drawings were made by different observers within one hour of the same time (U.T.) on the same date to compare them for detail confirmations. This process is here only applicable to a drawing by Stephenson and one by Cragg both made on August 9. It is striking to see the similarity of details recorded by these two excellent observers, working some two thousand miles apart and naturally completely independently.

REMARKS BY THE RECORDER. Work on Venus has been rapidly increasing in quantity and quality during the last two months. All observers who can conveniently use their telescopes, even though it be only occasionally, when the planet is well placed for observation are urged to do so. Drawings are particularly important whenever possible since comparisons can then be made which may eventually indicate at least one feature which reoccurs at regular intervals; of course, the importance of this possible recurrence can be easily understood. Several observers are now finding color filters to be of considerable help, and others may well benefit by using them.

It might be interesting for active observers of Venus using six-inch or larger telescopes to experiment with off-axis diaphragms and to report their results to the Recorder. When sufficient data are available the results will be carried in the Interim Report.

JUPITER IN SEPTEMBER

by Elmer J. Reese

Jovian Activity Continues. On September 8, Mr. T. R. Cave wrote in part as follows: "I have noticed during the last two weeks an interesting change in the Equatorial Zone and in detail just north and south of this area. A great number of short, slightly curving wisps have been seen and a profusion of very minute detail. I hope others can confirm these changes on Jupiter; they have appeared remarkable to me." These striking changes have indeed been confirmed and a discussion of some of them will be found in this report. We hope that observers will continue to follow developments on Jupiter as late as possible in the present apparition and as early as possible in the next one.

EZ Festoons. Dr. J. C. Bartlett continues to devote much attention to the very active system of festoons or dusky streaks now visible in the EZ extending from the south edge of the NEB to the SEBn (or, in some cases, to the EB or even the SEBs). The following remarks by Bartlett are largely confirmed by the work of other observers in our group: "On going over my records I find that from June 24 through August 21 there were many festoons beginning on the south edge of the NEB and ending on the EB with which they appear to merge and even to give rise to in some longitudes. Since August 21, however, they have all connected with the SEBn as I see them." We have already mentioned that an apparent attraction existed between the SEB disturbance and the dark projections on the south edge of the NEB (page 13 of September issue). We now wonder if this change in the festoon system can be linked with the disturbance in the SEB? Your ideas and comments concerning the physical nature of Jupiter are always most welcome!

SEB Disturbance. The violence of this disturbance is very well illustrated on beautiful drawings by O'Toole on September 28 at CM (II) 163° and on Sept. 30 at 145°. A very bright oval-shaped area in the Interior Zone near 139° (II) evidently vanished between these two dates, while very dark condensations at 142° and 158° made their appearance. The markings in the Interior Zone have been

changing so rapidly that it has been very difficult to recognize them even on closely adjacent dates. The advancing front of the disturbance had reached 337° (II) on October 12. Following this front the Interior Zone tended to get darker and darker until the preceding shoulder of the Red Spot Hollow was reached. This dark shading has not been continuous, but broken into a number of dark areas. Bartlett observed the preceding end of one of these dark masses at 111° on Sept. 14 and again at 97° on September 21. These positions indicate a westward drift of 2° per day which is in good agreement with the drift of the advancing front of the entire disturbance (page 9 of October issue). The Interior Zone remains very bright following the Hollow - almost as bright as the STrZ. Will this brightness disappear when and if the advancing front of the disturbance finally reaches the following shoulder of the Hollow in early December?

Red Spot and Hollow. As the SEB darkened in September and early October, it became evident that the Red Spot was getting fainter and more diffuse. This fading is evidenced by the fact that E.K. White could not see the Spot or Hollow on September 7 with his excellent 7½-inch reflector despite fairly good seeing! On September 22 E. E. Hare observed what may well have been an indication of the return to prominence of the Hollow. On that date Hare observed a very dark column in the STrZ at the preceding end of the Hollow which resembled the column observed there in 1948.

We have these longitudes (II) for the Red Spot Hollow:

Observer	Limiting Dates	Prec. End.	Center	Fol. End.
Hare	Aug. 9-Sep. 22	229° (7 obs.)	249° (1)	267° (1)
O'Toole	Aug. 16-Sep. 9	230 (2)	250 (1)	265 (1)
Reese	Aug. 7-Sep. 27	229 (12)	247 (1)	260 (1)
Stephenson	Aug. 7-Aug. 24	229 (3)	---	---
White	Jul. 28-Sep. 7	230 (3)	242 (1)	254 (2)

We have these longitudes (II) for the Red Spot:

Hare	Aug. 9-Sep. 22	232 (7)	247 (4)	261 (6)
O'Toole	Sep. 9	244 (1)	253 (1)	259 (1)
Reese	Aug. 7-Sep. 27	230 (12)	245 (12)	259 (10)
Stephenson	Aug. 7-Aug. 24	---	246 (2)	258 (2)
White	Aug. 26-Sep. 7	238 (2)	249 (1)	255 (1)

Belts and Zones. A list of the more prominent belts observed in September arranged in order of decreasing average conspicuousness follows: NEB, STB, SEBn, NTB, NNTB, SEBs, EB, SSTB. This list is based on a total of 19 sets of estimates by Brinckman, L. Johnson, O'Toole, and Reese. Near the end of September the combined SEB was so dark immediately preceding the Hollow that it exceeded the STB in conspicuousness and even rivalled the NEB.

Six sets of intensity estimates by Bartlett in September place the zones in the following order of decreasing brightness: STrZ, STeZ, NTrZ. Eight sets by Reese give these results: NTrZ, STrZ, STeZ, SEBZ, NTeZ, EZ. L. Johnson found the NTrZ a little brighter than the STrZ on September 3 at 3^h.

STB Cloud. This persistent feature was still faintly visible at opposition this year. Haas, Hare, Stephenson, and Reese have obtained a total of 41 transits of the cloud during the present apparition. Their results place the center of the cloud at 150° (II) on July 20 with a length of 13° and a drift of 26°.1 every 30 days in decreasing longitude (II). This corresponds to a rotation period of $9^h\ 55^m\ 5^s$ which is in good agreement with a period of $9^h\ 55^m\ 6^s$ obtained in 1948. The first observation of the cloud in 1949 may have been made on March 19 when Haas placed its preceding end at 245° (II). Late in July the cloud became very faint and diffuse and was lost. However, Stephenson obtained 9 transits of a very faint and inconspicuous cloud in the STB from August 6 to 23. This cloud was about 13° long and its center drifted from 153° on August 6 to 145° on August 23. If this is the same cloud which was observed prior to opposition, it is evident that its movement in decreasing longitude was greatly decelerated late in July. L. T. Johnson observed a faint, whitish rift along the middle of the STB on September 14 at 1^h with the preceding end of the rift near the central meridian or 96° (II). Hare also observed on this date and estimated the preceding end of a lighter section of the STB to lie near 106°. Reese found this white rift very bright and distinct on September 26 when its preceding end was at 88° and again on October 10 when its preceding end was at 72°. This is very probably the same cloud that was observed prior to opposition and its drift from July 20 to October 10 has been minus 26°.4 (II) every 30 days.

SOME RECENT LUNAR OBSERVATIONS

D. P. Barcroft observed the crater Proclus in good seeing with his 10-inch reflector on August 1, 1949 (U.T. here and later). The seeing was good, and the crater was about 39 degrees from the sunrise terminator. Barcroft reports: "I kept on seeing the little craterlet in the east wall reported by Schmidt [pg. 218 of Goodacre's Moon]; there was some dark detail near by, probably a streak up the side of the wall.

"Then I began to notice an abundance of detail, both on the floor and up the east wall which appeared terraced. About the best comparison I can think of at the moment is that of an architect spider's web sliding out from the corner of a window; the radiant here was the relatively large dark depression in the west wall."

On pg. 1 of our August issue we invited observers to examine "fault b" in Conon between colongitudes 24° and 40°. (Colongitude is the eastern longitude of the sunrise terminator measured all the way around the moon up to 360°.) E. E. Hare observed Conon on July 5 and 6 with a 7-inch reflector at 255X and fair seeing. On July 5 at colongitude 21°.1 he found the northwest inner wall of Conon very dark and could discern no darker edge at "fault b". On July 6 at 33°.1 "fault b" was "seen unbroken". Though the feature was "definitely seen", Hare does not remember it as then unusually conspicuous.

At the same time on July 6 Reese made his surprising comparison that "fault b" was almost as conspicuous as the Straight Wall (pg. 10 of September issue).

The walled plain Plato remains a favorite object with some of our members. E. K. White observed it with his 7-inch reflector on September 13 on a dawn sky in fair seeing and excellent transparency. The colongitude being 161°.6, White easily saw a number of craterlets on the floor; and the twin craterlets in its north central part (The Strolling Astronomer, Volume 3, Number 1, pp. 3-5, 1949)

were clearly divided and appeared to be of equal size. White observed again on September 14 in a dawn sky with fair seeing and a thin haze. The colongitude then being 173°8, one might have expected the floor craterlets to be more conspicuous under the lower lighting. On the contrary, they were far more difficult; White could only suspect the near-central craterlet, and others were quite invisible to him. White expresses the opinion that this discrepancy cannot be blamed upon the slight terrestrial haze on September 14 and suggests some sort of obscuring lunar haze over most of the floor of Plato. To support this interpretation, he points out that on September 14 he did see in Plato a craterlet near the northeast wall and a rather difficult hill near the southwest wall. Moreover, he counted-and saw sharply-at least a dozen minute craterlets on the floor of Ptolemey, most of them as tiny as the invisible craterlets in Plato.

E. J. Reese examined Plato in fairly good seeing on September 10, 1949 with his 6-inch reflector at colongitude 120°8. He easily saw the twin craterlets as twins, and the northeast twin was definitely brighter and larger than the southwest one. Reese especially directs attention to a bright spot (a craterlet?) approximately three-fourths of the way from the near-central craterlet to the most conspicuous craterlet in the southeast portion of the floor. This spot Reese had not seen before; in particular, it is absent from a drawing he made on November 30, 1947, in almost perfect seeing at colongitude 116°4. Nevertheless, on September 10 it was as conspicuous as a spot some miles south of the central craterlet and visible to Reese on November 30, 1947, as well as on many other dates in recent years. There is, of course, the inevitable question of whether it might have been seen if it had been carefully looked for; but it would be distinctly worthwhile for lunarians with excellent instruments to make a careful study of the pertinent portion of the floor of Plato. W. H. Haas on October 3, 1949, in fair seeing could see the spot some miles south of the central craterlet with difficulty but could not see the spot first recorded by Reese on September 10. The colongitude was 41°5, and the two observations may not be comparable because of this large difference in illumination.

Observations of very dim prolongations of the horns of the moon into the dark hemisphere are not rare. Refer, for example, to The Strolling Astronomer, Volume 2, Number 9, pg. 10, 1948. Perhaps a typical record is one made by Haas with a 6-inch reflector on September 18, 1949 at $11^h\ 36^m$ and thus about four days before new moon. "Each cusp is prolonged in that the rim of the earthlit hemisphere adjacent to it is slightly but distinctly brightened. The length of each prolongation is four or five degrees. Their width is perhaps two seconds of arc."

On July 28 D. O'Toole observed the moon with his 3.5-inch reflector and 60X only two days and nine hours after new moon. He was surprised to note a faint, detached spot on the dark limb about ten degrees from the visible south cusp. He suspected a thin, faint line joining this spot to the cusp. No similar appearances were noted near the north cusp. An oil painting by O'Toole shows well the faint and indistinct character of the spot. On July 29 what was presumably the same spot was recognized to be an isolated peak, now fairly bright and about five degrees from the south cusp. On July 30th the peak was much brighter but was still isolated. O'Toole on this date secured a photograph of the appearance. The editor would suggest that on July 28 the peak was obtaining penumbral illumination. He would also suggest, on the basis of this example, that an adequate study of the cusp-prolongations may require allowance for the role of penumbral lighting and detailed knowledge of the topography of the moon's polar regions.

The remainder of this article will deal with the walled plain Grimaldi and may best be read in connection with Dr. J. C. Bartlett's article on this subject in the February and March, 1949, issues. On pg. 1 of the August issue we described how T. Cragg on March 14, 1949 at colongitude 83°.4 suspected that the Central Bright Streak was composed of minute hills, using his 6-inch reflector. Haas confirmed this observation on September 7 at 85°.5; though the seeing was poor, the moon was well defined in the excellent Griffith Observatory 12-inch refractor. He perceived a north-south chain of hills in the north central part of the floor, shadow showing on their east side; these hills appeared quite to coincide with part of the Central Bright Streak visible under higher lighting.

D. O'Toole made a drawing of Grimaldi with a 6-inch reflector on July 11 at colongitude 96°.4. He found that the west edge of the Central Bright Streak was sharply outlined while the east edge was much less distinct. A darker area was remarked in the northwest corner of the walled plain. O'Toole observed Grimaldi again on August 8 near 77°. Again the west edge of the Streak was sharper than the east edge. A couple brighter areas (individual hills?) were seen in the Streak, and the floor was darkest near its southeast edge. Near 127° on August 12 O'Toole was surprised to find the east edge of the Central Streak "definitely as sharp as the west edge." A brighter spot in the Streak, two extremely faint light patches on the floor, and the darker area near the southeast edge were visible.

Dr. J. C. Bartlett has discussed in correspondence his finding the Grimaldi changes very abnormal during the August lunation. He qualifies this statement with the remarks that he does not find <u>anything</u> constant about Grimaldi except its size and that he considers it totally impossible to predict the appearance from knowledge of the illumination, the changes being too irregular. Space unfortunately allows only a hurried summary of his communications. The "normal" course of development of the floor-darkening, he says, is for dark patches to form near the east wall soon after sunrise and to coalesce so as to make a continuous darker border to the floor. This eastern darkening then moves westward towards the center of the floor. At about the same time a darkening of the west edge of the floor moves eastward. The two waves of darkening eventually meet near the center of the floor. Occasionally, he continues, their advances are somehow "inhibited". The portions of the floor normally covered by them then darken gradually and relatively slightly; as a result, under high lighting a floor less dark than usual has distinctly darker eastern and western borders. He thinks that just such an inhibiting effect occurred during the August lunation.

On August 8 at 78°.3 Bartlett found the "usual very dark border" on the east floor. Incidentally, the south apex of the Central Streak lay much farther south than usual (as it also did on August 9 and 10). On August 9 at 90°.0 the dark eastern border had failed to show a westward advance. Two dark areas had begun to develop at the west edge of the floor, one of them the northwestern dark area drawn by O'Toole on July 11; and there was a slight darkening in the extreme south part of the floor. The general tone of the floor was the same as on August 8. On August 10 at 102°.0 and 103°.3 the floor was no darker than on August 9, being the same tone as Oceanus Procellarum according to Bartlett. The dark eastern border had not only failed to advance; it had actually <u>contracted</u> and was perhaps now confined to the east inner wall of Grimaldi. The western dark patches had perhaps also become smaller. There was no sign of the Chevron Pattern normally present; it had been well developed as early as 85°.2 on Nov. 15, 1948 and had been faintly but definitely present at 106°.9 on August 21, 1948.

On August 10 Bartlett found both edges of the Central Streak diffuse and irregular and is apparently thus in agreement with O'Toole's view of equal sharpness on August 12. Bartlett speaks of whitish spots within the Streak in August, of which O'Toole saw one or two. O'Toole's dark area in the southeast is probably part of Bartlett's dark eastern border.

Because of Dr. Bartlett's surprising observations in August and especially because on August 9 he predicted the probable near-noon appearance of Grimaldi that month (a very rash prophecy in his opinion), we should like to urge all our readers who recorded observations of Grimaldi in August to send in reports on what they saw. If these reports are mailed so as to reach us no later than November 15, they can be discussed in the December Strolling Astronomer. A few drawings already at hand suggest that the prediction may have been at least partially fulfilled.

MARS, SATURN, AND ANDROMEDA NEBULA OBJECT

During the last month reports on Mars have been received from T. Cragg (12-inch refl.), W. H. Haas (6-inch refl.), E. E. Hare (7-inch refl.), L. T. Johnson (10-inch refl.), D. O'Toole (6-inch refl.), E. J. Reese (6-inch refl.), and E.K. White (7-inch refl.).

Cragg's only observation was made on August 1 and when the central meridian of longitude was 268°. The north cap was far brighter and far larger than the south cap. It is difficult to identify markings on a drawing he made of the tiny disc; perhaps Syrtis Major and Casius are imperfectly shown.

The other observations here discussed were made in September and October. All observers agree that the north cap was then brilliant, and most of them emphasize that the bordering north polar band was extremely dark. In fact, the north cap and polar band have sometimes been seen when the disc was otherwise blank of detail. Hare measured the angular diameter of the north cap on his drawings to range from 39° to 44° in late September and early October. The south cap is smaller, dimmer, and more diffuse than the north cap. Haas several times found the south cap to be not diametrically opposite the north cap, perhaps further evidence of the atmospheric nature of the south cap at present.

Mare Acidalium was prominent (for a feature on such a small disc) to Reese, Hare, O'Toole, and Haas near the first of October. Reese on September 25 found it "very dark" near the terminator at C. M. 65°. Hare on September 30 at C. M. 34° recorded Acidalium to be quite dark at its north base on the polar band and to fade rapidly toward a diffused and indefinite southern end. Some of the tropical maria have been drawn, as well as a few canals (Indus, Ganges, Nilokeras, and Nepenthes). Nepenthes was conspicuous to Hare on October 9.

On November 15 the angular diameter of Mars will be 5".6. The north pole will be tipped toward the earth by 23 degrees so that northern features will be seen better than southern features. The quantity $\odot$, the areocentric longitude of the sun measured so as to be 0° at the vernal equinox of the northern hemisphere, will be 37°. Observers are again requested to report each month's work no later than the tenth of the following month.

Both O'Toole and Haas observed Saturn on a few dates in October. The Equatorial Zone is still brilliant but only to the south of the projected rings. The South Equatorial Belt remains dark and is the easiest belt to see. Near 12^h, U.T., on October 19 Haas found these other belts in order of decreasing conspicuousness:

South Polar Band, North Polar Band, North Temperate Belt. The two observers agree that the ball is distinctly more dusky south of the S. E. B. than north of the rings. Haas remarks whitish polar caps on both the north and the south limbs. The shadow of the rings on the ball is currently easy to see. The North Tropical Zone between the N. T. B. and the shadow of the rings is now not appreci brighter than the ball north of the N. T. B.

The rings have closed considerably since last summer; for the Saturnicentric latitude of the earth was only -4°1 on October 1 and will diminish numerically to -1°5 at the end of the year before increasing again. It should be interesting to observe the color and brightness of the narrow rings, the editor having long wondered whether some colors he and others observed in the rings in 1936 and 1937 are manifested only when they are narrow enough. Perhaps such studies can give some information about the physical nature of the rings. When the rings are least opened in late December, it might be worthwhile to look for possible irregularities on the narrow ring-arms.

On pg. 14 of our October issue we mentioned a last-minute communication about how T. R. Cave and others had observed a star in the Andromeda Nebula on September 25 (U. T.). The exciting possibility was that it might be a supernova. Unfortunately, it now appears that it was merely a foreground star. Dr. Baade of the Mount Wilson Observatory wrote Cave on September 30 that he photographed the Nebula on September 25 with the 100-inch reflector. He compared the plate with previous ones and found no evidence of any new object within 30 minutes of the nucleus. Cave reports that most of the observations on September 25 at Bohannon's house were made with a 12-inch telescope, and he thinks that he and the others must have failed to allow sufficiently for the greater light-grasp of this comparatively large telescope.

STREAK-METEORS AND FLASH-METEORS

The meteors which meteorites give rise to when they pass through the atmosphere can, it seems, still furnish surprises. In Contributions of the Meteoritical Society in Popular Astronomy, Volume 56, pg. 498, 1948 Professor Mohd. A. R. Khan described his observations of "Streak Meteors without Perdeptible Nuclei." The streaks observed, which followed in the wake of the meteor otherwise unseen in his opinion, were 3 or 4 degrees long and 1 or 2 degrees broad. The great unusualness of the streaks is evidenced by the fact that apparently none of those who heard the paper read at the Eleventh Meeting of the Meteoritical Society had ever observed such phenomena. The Pakistan member of the A.L.P.O., Mr. P. Barnes, has become a very active member of the American Meteor Society. He has recorded Professor Khan's streaks and has also observed equally puzzling stationary flashes of light. He summarizes his observations in a letter dated July 28, 1949; his dates and times below are by India Standard Time.

Mr. Barnes first saw the flashes on July 6, 1948. While watching a part of clear sky near Scorpio and Serpens, he noticed stationary flashes lasting from 1/3 to 1/2 of a second over most of the visible area; more than 20 such occurred in two hours. The sky was clear enough to reveal stars of the fifth magnitude at the zenith. On the next night, July 7, the phenomenon was repeated in a patch of sky between Ursa Major and Virgo. He also observed 10 or 12 normal moving meteors from a radiant in Serpens. The flashes occurred anywhere in an area 20 degrees across. By contrast, on July 31-August 1, 1948, he remarked 45 meteors all over the sky in 90 minutes but saw no flashes. These were next observed on August 28, 1948 when there were about 10 flashes stationary in various

parts of the sky, none lasting more than 1/25 of a second. (It is naturally difficult to make accurate estimates of such short intervals of time, but his impression must have been one of extreme brevity.) On August 29 he saw "many flashes all white during half hour before 10 P.M." He watched for 90 minutes after 10 P.M. but saw no more of them. The next mention is on March 18, 1949, when the Zodiacal Light was recorded as a narrow cone with its apex between Alpha and Beta Arietis. There were "more flashes standing in 30 degree wide area near zenith." One meteor of magnitude-2 showed a streak of the sort published upon by Khan. On an unrecorded date since March 18 no ordinary meteors were seen in a two-hour watch, but there were some stationary flashes.

As Mr. Barnes points out, it is most difficult to suppose that 20 or more meteors observed in a couple hours are all moving exactly along the line of sight. It is to be noted again that they appeared at many different points over a wide area of sky. He is well aware of the possibility of a physiological explanation; however, on some of the occasions when he saw the flashes a native of Pakistan was with him on the roof of his residence and confirmed their appearance. He wonders whether it may be that a meteorite, presumably of unusual structure, can be instantly consumed upon entering some particular layer of the earth's atmosphere. If so, the observed path would be a point. In this connection one thinks of the concept of contraterrene meteorites discussed by Dr. Lincoln La Paz in Contributions of the Society for Research on Meteorites, Vol. 2, No. 4, pp. 244-7, 1941 and Vol. 3, No. 2, pp. 93-5, 1943.

The Institute of Meteoritics would like to know whether any other members of the A.L.P.O. have ever seen meteors of the two kinds here described. (Occasional stationary meteors are not remarkable.) They may well deserve close study.

NOTES

It is time for active observers to order their copies of the 1950 American Ephemeris and Nautical Almanac. The price is $3.25, and the book may be obtained from the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C. A. E., as it is often briefly called, contains such a wealth of information about Martian and Jovian central meridians, lunar colongitudes, satellite-positions, Saturnian ring-aspects, Mercurian and Venusian phase-angles, and many other things that it is almost as essential to the serious lunar and planetary observer as an eyepiece for his telescope. (The editor will admit, though, that he has never read this book through from cover to cover.)

Some of the members of the A.L.P.O. had good views of the lunar eclipse on October 7; others saw only clouds. It is known that some who observed have not to date submitted reports, and there has scarcely been time enough yet to hear from our European colleagues. Therefore, a discussion of the eclipse will be deferred to a future issue. There is an unfortunate lack of pre-immersion observations of regions watched for possible eclipse-caused changes. We especially desire to know the normal relative brightness of three bright spots (craterlets) near the northwest edge of Grimaldi. These form a right triangle; the south side is much shorter than the other two sides, the two spots which form the south side being perhaps five miles apart. Even those who did not observe the eclipse can assist by watching these spots when the solar illumination is again the same as just after totality. Such future observations will be impossible in this country in November but can and should be attempted near 8^h on December 5, U.T.

We are indebted to our French colleague Monsieur R. Rigollet, editor of Documentation des Observateurs, for excellent photographic charts of the paths among the stars of the asteroids Clotho and Pax in November. We shall be glad to lend this material to interested persons.

Mr. John J. O'Neill, 209 North Long Beach Ave., Freeport, Long Island, New York saw a curious appearance to the planet Saturn on April 28, 1949, at about 10:40 P.M., E.S.T. ($3^h\ 40^m$ on April 29, U. T.). He used a 4-inch refractor at 50X; the air was very clear but very turbulent. The image of the planet twice became temporarily double, this aspect each time lasting a few seconds only. The distance between the centers of the two images may have been half the diameter of the planet. The doubled appearance was not repeated during 90 minutes of subsequent looking, the atmospheric turbulence having become much less. Mr. O'Neill later learned that Mr. Richard Luce of the Hayden Planetarium has seen the same kind of double image of Saturn with a 6-inch reflector, possibly on May 28, 1949. O'Neill wonders whether double refraction in the earth's atmosphere is possible under certain conditions. To him the effect was very reminiscent of the appearance of an object seen through a piece of Iceland spar. Perhaps some of our readers would like to comment on this doubling effect. Barring results obviously due to optical defects of instruments used, the editor cannot remember having ever seen such an aspect except on Mercury, and even then only rarely under extremely bad atmospheric conditions.

It may be recalled that Saturnian satellite phenomena will be numerous during the 1949-50 apparition. In this connection the following translated extract from Orion for July, 1949 may be of interest: "Tethys was rather easily visible at its transits in front of the northern part of the dusky globe as a very small bright disc; its shadow was more difficult, looking like a small diffuse brown spot but contrasting with the greenish gray of the northern part of the ball. In order to be perceived in the vicinity of the globe, Tethys required the use of a small diaphragm masking the globe and the ring." The reference is to observations in April and May, 1949.

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