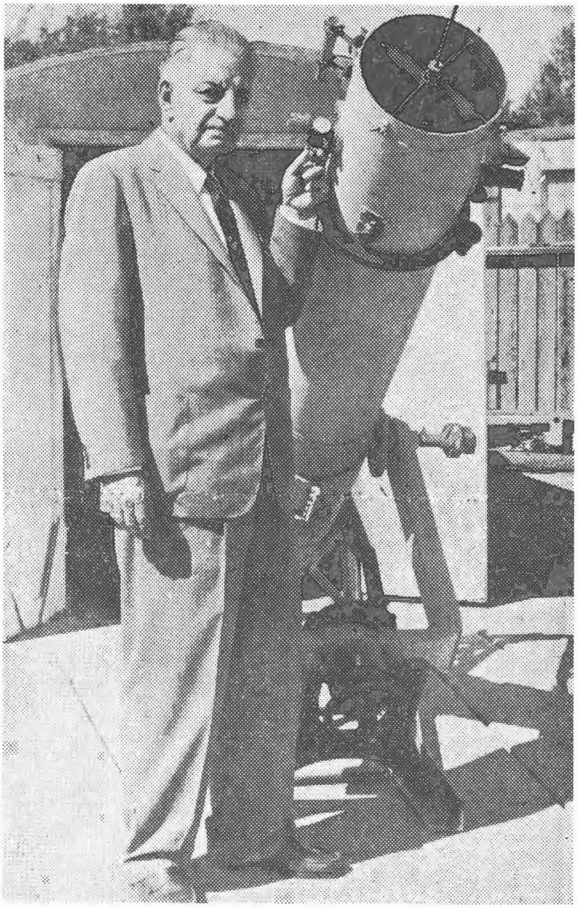
The Journal Of The Association Of Lunar And Planetary Observers

The Strolling Astronomer

David P. Barcroft Memorial Issue

Volume 25, Numbers 3-4 Published December, 1974



David P. Barcroft, the late Secretary of the A.L.P.O., with his 10-inch reflecting telescope at his home in Madera, California. Photograph taken in 1960. This copy from a newspaper clipping furnished by his sister, Mrs. Genevive Conn. He used this telescope chiefly in observations of the Moon.

THE STROLLING ASTRONOMER
Box 3AZ
University Park, New Mexico
88003

Residence telephone 522-4213 (Area Code 505)
in Las Cruces, New Mexico

ASSOCIATION OF LUNAR & PLANETARY OBSERVERS
ALPO

Founded In 1947

IN THIS ISSUE

ABC Print—Las Cruces

AN OLD LETTER FROM THE FIRST SECRETARY OF THE A.L.P.O.

By: David P. Barcroft, late Secretary of the A.L.P.O.

Foreword by Editor. David P. Barcroft, the Secretary of the A.L.P.O. from its beginning in 1947, died on July 13, 1974.

The article which follows has the format of a letter from Dave Barcroft to Walter Haas, A.L.P.O. Director, on the occasion of our fifteenth anniversary in 1962. It was originally published in The Strolling Astronomer, Vol. 16, Nos. 3-4, pages 54-56, April, 1962. The letter admittedly gives too much credit to the Director and too little to Dave Barcroft himself and many other selfless contributors of the A.L.P.O. in its early years. Nevertheless, our Secretary's letter reveals, we think, much of the spirit of the A.L.P.O. in its early years and much of what was best in amateur astronomy at that time. It must also reveal to a discerning reader much of the spirit of a noble and greatly loved amateur astronomer, David P. Barcroft. We would hence in true humility dedicate this issue of our Journal to his memory. The world of science will be fortunate if its future devotees share his enthusiasm, his generosity, his sympathetic understanding toward the least of amateurs and his deep appreciation of the historical work (and struggles) of our scientific forebears. His message of 1962 can still say much to us today.

Sesquidecennium

Madera, California
March 2, 1962

Professor Walter H. Haas
Director, Association of
Lunar and Planetary Observers
Pan American College Observatory
Edinburg, Texas

Dear Walter,

It is with the greatest pleasure that I answer "present" at our fifteenth annual roll-call. And of the numerous congratulations of which you will be the recipient, none can be more heartfelt than mine. For we have been together for a long, long time. Years ago, before some of our younger fellow members were born, with the kindness which has ever characterized you, you took me under your wing, and you have never set me adrift though the temptation to do so must have been great at times. I was attempting some lunar observations and was having a pretty bad time of it. Had it not been for your timely encouragement, one more telescope might have landed atop the junk heap.

When in 1942 you published "Does Anything Ever Happen on the Moon?", I realized that I had hitched my wagon to a star; and I determined that the hitch should stay fast. You will recall that I overcame your objections to the title based on its possible implications of sensationalism by pointing out that we could successfully lay the blame at the door of Simon Newcomb. I now confess to a small grudge I have always held against Simon on account of the disdain he manifested, and in his best pontifical manner, toward our Moon. He didn't think there would ever be a flying machine, either.

Anyhow, the rapidity with which our large stacks of reprints of Does Anything Happen dwindled proved conclusively that there were amateur observers everywhere who were avid for material of that kind. I feel that this little lunar classic should not be relegated to oblivion, but should be printed again. Think about it, Walter. As a matter of fact, this was undertaken a few years ago by another amateur organization, but alas, no one is better aware than you are of the perils which are a threat to infant publishing enterprises; and this one was stricken down in the midst of a laudable endeavor. Does Anything Ever Happen was the first treatise on selenology to appear on this continent of any consequence from the time your brilliant mentor, W. H. Pickering, laid down his pen in order to "join the Majority" as the English were wont to say.

There was no large-scale newscast to herald what happened in March 1947. As I recollect, there was no fanfare at all. But a proposal had been made, and it was directed to a few people hither and yonder who might be interested. All things considered, the response was surprisingly good. About four months later there were about 50 enrolees; and The Association of Lunar and Planetary Observers was off its launching pad. But its orbit was not to be established and stablilized without a good deal of strenuous work at the controls. For this was a "lift yourself by your bootstraps" operation, if there ever was one, and so it would continue to be for several passes. There appears no hint of this in those choice collectors' items which in toto constitute the back volumes of the journal which members have affectionately nicknamed "The Stroller". But I was there at the start; and from the favorable vantage point to which you had assigned me I think I have had a better opportunity to observe what was happening than anyone else save yourself. I know of problems you had to solve, many appearing to have no solution. I know of obstacles which confronted you which to a less determined soul would have seemed insurmountable. But I don't think the issue was ever in doubt. You have never faltered; and today our Association is an institution of such strength and stature that it enjoys the respect of astronomical circles throughout the world, and justly so.

And there have never been finer individuals than those who have made up the ranks of the Association during its lifespan. They have been your inspiration; the way in which they have rallied to your call has rewarded you, and amply so.

I have come to feel that every fellow member, regardless of where he may be, and irrespective of whether I know his name, is a personal friend of mine. For if each of us likes to observe the moon and planets with our telescopes, how can we be other than friends? What other type of common interest could form the basis of a warmer friendship? But lest you start thinking that I'm up to my old tricks again, I pause long enough to say that I know they were always <u>your</u> friends, and I only want to share them with you.

Fifteen lighted candles are shedding their pleasant glow on this happy occasion, Walter, and all of these friends of ours are with us. Every one of them wants you to know that he fondly hopes that the future will yield to our Association that which the present so certainly promises, which is another way of saying, "There'll be lots more candles."

Cordially yours,

David P. Barcroft
Secretary, A.L.P.O.

<u>REPORT ON MUTUAL PHENOMENA OF JUPITER'S SATELLITES IN 1973</u>

By: Phillip W. Budine, A.L.P.O. Jupiter Recorder

One satellite of Jupiter can occult another satellite when the Earth is close to the plane of the satellite-orbits, which is also the plane of Jupiter's equator. Likewise, one satellite can be eclipsed in the shadow of another when the Sun is near the plane of Jupiter's equator. These mutual occultations and eclipses hence occur in "seasons" at intervals of about six years, one-half the period of Jupiter's revolution around the Sun. Such a series began on June 6, 1973.

In 1973 seven observers contributed observations of these mutual phenomena to the A.L.P.O. Jupiter Section. They were able to observe such phenomena on six different dates.

Predictions for the mutual phenomena were supplied to the A.L.P.O.

by Kaare Aksnes, who sent the author a paper entitled, "Revised Predictions for Mutual Phenomena of Jupiter's Satellites, 1973-74". Kaare Aksnes is with the Smithsonian Astrophysical Observatory in Cambridge, Mass. Our readers might like to compare the actual observations with the predicted data; therefore, I am including below the table predictions from S.A.O. for the dates of all the observations.

The following is an explanation of the table data by Mr. Aksnes: the first two columns give the Universal Time and date of the mid-event to the nearest minute. In the next column, the numbers 1, 2, 3, or 4 specify which satellites are involved; the letters O, E, P, A and T stand for occults, eclipses, partially, annularly and totally, respectively. The terminology partial, annular or total, as well as the magnitude (MAG), i.e., the fraction of a satellite's diameter that is covered (for a total event, the magnitude can become larger than one depending on how central the event is) refer to the obscuration by the disk, umbra or penumbra of the other satellite, according to whether the event is an occultation, an umbral eclipse or a penumbral eclipse. In the former two cases, the semi-duration in seconds is given in the column next to the last column, while the last column similarly gives the semi-duration in the penumbra. (The beginning and the end of an event can be found from the mid-time by subtraction or addition of the semi-duration). Also given is the expected drop (ΔV) in visual magnitude (Vmax) for a satellite undergoing eclipse, or for the two satellites combined when one is occulting the other. Finally, in the next column the occulted or eclipsed satellite's apparent angular separation (elongation) from the center of Jupiter at the mid-event is given in Jovian radii.

Predictions for Observed Phenomena in 1973

1973	U.T.	Event	MAG	ΔV	Vmax	Elong. (R-Jup.)	Semi-Duration	Penumbral Semi-duration
Jul.29	23:38	1O2P	0.76	0.37	4.11	5.52	200 seconds	---
Aug.13	3:49	1O2P	.83	0.42	4.12	5.71	220	---
Aug.13	4:25	1E2P	.44	0.87	5.07	5.38	170	260 seconds
Sep.7	1:26	1E2P	.73	1.82	5.16	4.85	330	440
Sep.24	1:43	3O2P	.65	0.28	4.14	9.04	760	---
Nov.4	23:20	2E1A	.32	0.66	5.16	2.98	80	150
Nov.20	0:45	3E1P	.90	4.97	5.25	3.10	730	950

Observations of Jovian Mutual Satellite Phenomena

On July 29, 1973, Alan W. Heath of England was observing from Long Eaton, Nottingham, and observed the occultation of II by I. He was employing a 12-inch reflector at 190X with seeing 3 on the Antoniadi Scale. Readers should refer to his sequence of sketches, here shown in Figure 1. Predicted mid-event time was 23:38 U.T., which appears to agree with his sketches. The event was predicted as a partial occultation of Magnitude 0.76; the sketches indicate that the event was actually very close to total, perhaps 0.90 in magnitude.

Mr. John E. Bortle was our most active observer of Mutual Satellite Phenomena in 1973. He was observing from Stormville, New York. Mr. Bortle used a 12-1/2-inch f/5.6 reflector at 88X and 146X. He recorded observations on August 13 and September 7 as described below. On both dates the seeing was 3 on a scale of 0-5, and the transparency was very good. His method of recording observations was by speaking into a continuously running tape recorder simultaneously recording CHU time signals. His observations and comments follow:

August 13, 1973 Occultation of II by I

U.T.	Description
3:15.0	I and II separated by about 8". Well separated at 88X.
3:30.0	I and II now probably less than 5" apart, still clearly separated at 88X.

U.T.	Description
3:37.1	Separation 1"-2", clearly separated at 146X, thin line of dark sky.
3:38.1	Only thinnest thread of dark sky separates satellites now.
3:39.1	Black ligament separating satellites beginning to rupture.
3:39.6	An intensity minimum between satellites is noted, but no clear dark sky separates them now.
3:40.7	Intensity minimum still present.
3:41.2	It appears that II will pass south of the center of I.
3:42.0	Intensity minimum only suggested now, satellites almost completely fused.
3:42.8	Combined image of satellites has taken on a bread-loaf appearance, only the weakest suggestion of an intensity minimum now.
3:43.3	Still some slight suggestion of an intensity minimum.
3:43.8	Although slightly elongated, the satellites appear as a single object now.
3:44.8	The combined image of the satellites appears perfectly round and without any elongation at 146X. The combined brightness of the two satellites still does not equal the brightness of III.
3:46.8	Combined image still round.
3:51.7	Image appears definitely elongated once again.
3:52.6	It is quite obvious satellite II passed south of the center of I.
3:54.6	There is quite a definite intensity minimum between I and II.
3:55.4	Satellites almost separated now; dark sky almost separates the satellites.
3:56.1	There is definitely dark, clear sky between I and II now, separation very obvious at 146X
3:57.4	Satellites judged to be separated by several seconds of arc.

Mr. Bortle also says: "Observations were plotted against time and a scale of 1) clear separation, 2) slight separation, 3) intensity minimum only, 4) fused image, 5) elongated slightly, 6) single image. Time of minimum separation on this basis determined to be 3:47.7 U.T. It is also estimated that II passed south of the center of I by possibly half the radius of I or 0"25."

<u>August 13, 1973</u> <u>Eclipse of II by the Shadow of I</u>

U.T.	Description
4:16.0	I is estimated as magnitude 5.0, assuming III = 4.4 and IV = 5.4.
4:17.2	II = 5.2 using I.
4:19.2	II = 5.2 using IV.
4:20.0	II = 5.15 using I and III.
4:20.5	II = 5.2 using IV.

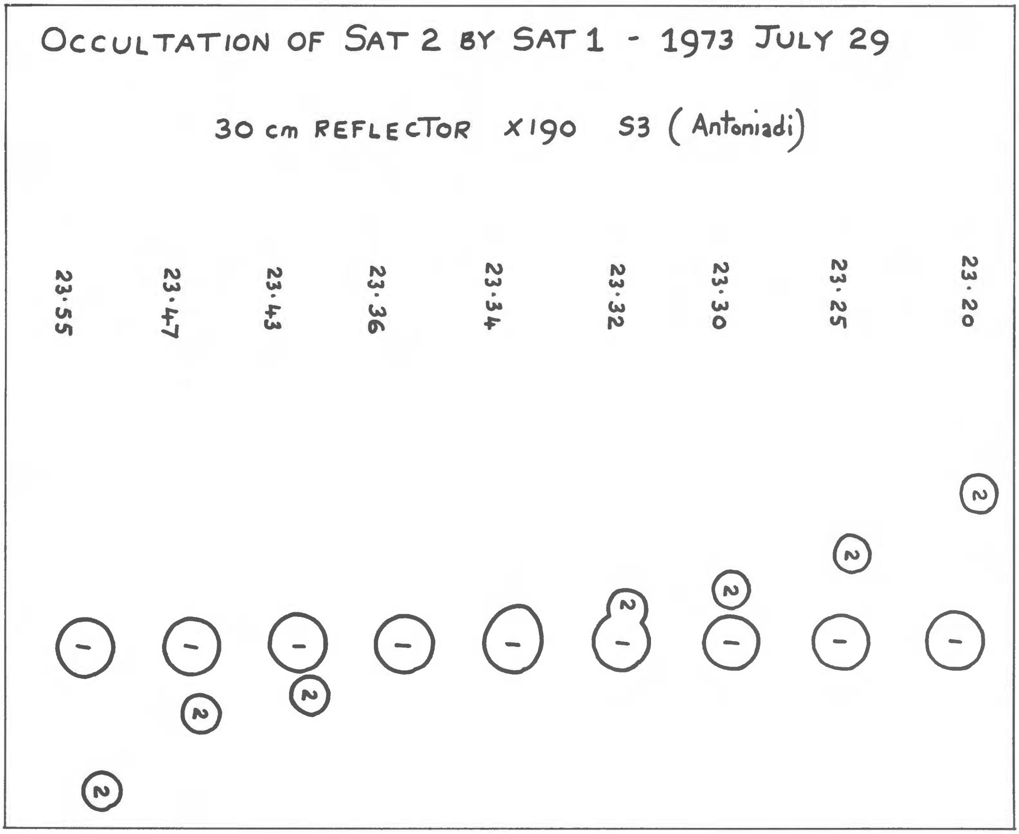


Figure 1. Series of sketches by Alan W. Heath of a partial occultation of Jupiter II by Jupiter I on July 29, 1973. Times shown are by Universal Time. See also text on page 43.

U.T.	Description
4:21.1	II = 5.2 using I and III.
4:22.0	II = 5.3 using I and III.
4:22.3	II = 5.3 using IV.
4:23.3	II = 5.4 using IV.
4:23.6	II = 5.3 using I and III.
4:24.0	II = 5.6 using I and III.
4:24.3	II = 5.65 using IV.
4:25.0	II = 5.6 using I and III.
4:25.2	II = 5.6 using IV.
4:25.3	II now appears distinctly bluish as compared to yellowish I. Before the eclipse began, I and II appeared similar in color.
4:25.8	II = 5.5 using IV.
4:26.2	II = 5.3 using I and III.
4:27.1	II = 5.4 using IV.

U.T.	Description
4:27.4	II = 5.15 using I and III.
4:28.2	II = 5.25 using IV.
4:28.5	II = 5.2 using IV.
4:29.5	II = 5.1 using I and III.
4.30.0	II = 5.15 using IV.

Mr. Bortle comments: "Observations were plotted and reduced by the tracing paper method using the two sets of data (estimates using I-III, and IV) both separately and together.

1) Estimates based on I and III	4:24.4, U.T.
2) Estimates based on IV	4:25.0
3) Based on all estimates	4:24.8

"The last time is the average of five independent determinations of the minimum light."

<u>September 7, 1973</u> <u>Eclipse of II by the Shadow of I</u>

U.T.	Description
1:17.1	II = 5.2 using IV.
1:18.1	II = 5.25 using IV.
1:18.7	II = 5.2 using IV.
1:19.4	II = 5.3 using I and III.
1:20.2	II = 5.2 using IV.
1:20.6	II = 5.3 using I and III.
1:20.8	II = 5.2 using IV.
1:21.2	II = 5.3 using IV.
1:21.6	II =5.4 using I and III.
1:22.0	II = 5.4 using IV.
1:22.5	II = 5.5 using IV.
1:22.8	II = 5.6 using I and III.
1:23.3	II = 5.6 using IV.
1:23.7	II = 5.9 using I and III.
1:24.1	II is noted to be of a bluish or grayish color and rather dull when compared to satellite I.
1:24.4	II = 5.75 using IV.
1:24.7	II = 7.4? using I and III.
1:25.2	II = 5.8 using IV.
1:25.6	II = 7.4? using I and III.
1:25.9	II continues to appear bluish or grayish in color.

U.T.	Description
1:26.2	II = 6.8? using I and III.
1:26.8	II = 5.8 using IV.
1:27.1	II = 5.7 using IV.
1:27.3	II still noted to be bluish or grayish in color.
1:27.4	II = 5.9 using I and III.
1:28.0	II = 5.55 using IV.
1:28.6	II = 5.4 using I and III.
1:29.1	II is noted to be no longer bluish or grayish in color but rather yellowish like satellite I.
1:29.4	II = 5.35 using I and III.
1:30.2	II = 5.35 using IV.
1:30.7	II = 5.35 using I and III.
1:31.1	II = 5.3 using IV.
1:31.7	II = 5.3 using I and III.
1:32.1	II = 5.25 using IV.
1:32.8	II = 5.2 using IV.
1:33.1	II = 5.25 using I and III.
1:33.4	II is noted to be clearly yellowish in color.
1:33.7	II = 5.25 using IV.

Mr. Bortle says: "Observations were plotted and reduced by tracing paper method using all but the three faintest estimates. The average of five independent determinations of the time of mid-eclipse was 1:25.7 U.T." He also comments: "Certainly, such events as those observed above are striking phenomena, the other few observers I know who also witnessed them say this. It is most unfortunate that recent series of such events, except for the present one, have been so unfavorably timed."

Prof. Walter H. Haas, our Director, observed the occultation of II by III on September 24, 1973, from Las Cruces, New Mexico, using a 12-1/2-inch reflector at 303X and 404 X. The phenomenon was seen on a twilight sky. Sunset at 1:02 U.T. Twilight ended at 2:24 U.T. His observations are as follows, where the seeing (S) is on a scale of 0 to 10 with 10 best and the transparency (T) is the limiting stellar magnitude:

U.T.	Description
1:11	303X, S=3-4, T=5 1/2. Discs cleanly resolved. III has about 3/2 the diameter of II.
1:20	Discs still easily resolved. Little difference in color or surface brightness of two satellites.
1:24	Still separate, 404X, S=3, T=5 1/2.
1:26	Still separate, 303X.
1:27	Images merging - first contact? II may have a slightly brighter surface; but except for size, the two discs are surprisingly similar.

U.T.	Description
1:29	A single elongated image.
1:32	A single and nearly round image. Is occultation total?
1:35& 1:38	303X, S=3, T=5 1/2. Image of III oval; N-S diameter divided by E-W diameter=4/3. Thus II is visible S of S limb of III.
1:40	Image now elongated in N preceding - S following direction. Mid-occultation presumably past.
1:45	404X. Image elongated; disc of II slightly the brighter.
1:50	404X, S=2-3, T=5 1/2. Last contact? Images are certainly separating, with II S and following III.
1:56	Discs now barely separated. 303X, 404X.
1:58	303X, S=3, T=5 1/2. Two satellites definitely separate.

Mr. Marvin E. Baldwin observed the eclipse of satellite I by II on November 4, 1973. He was at Andrews Air Force Base, Maryland, using a 10-inch reflector. The weather was thin clouds. The timing and data recording were by Richard Baldwin. The U.T. was checked by WWV, good to ± 1 second. The observing confidence level was good. The brightness of satellite I was continuously compared with the brightness of satellite IV. Satellite IV was arbitrarily assigned a step value of 13. Mr. Baldwin's observations are as follows:

U.T. h m s	Brightness Step	U.T. h m s	Brightness Step
23:15:05	10	23:19:05	16
23:15:25	10	23:19:25	18
23:15:45	10	23:19:45	19
23:16:05	10	23:20:05	17
23:16:25	11	23:20:25	15
23:16:45	10	23:20:45	13
23:17:05	10	23:21:05	12
23:17:25	11	23:21:25	12
23:17:45	11	23:21:45	12
23:18:05	11	23:22:05	10
23:18:25	12	23:22:25	10
23:18:45	14	23:22:45	11

Mrs. Joyce Sterling of Needham, Maine, observed the eclipse of satellite I by satellite III on November 20, 1973. She employed a 3-inch refractor. The weather was clear. Seeing was good at the beginning of the eclipse, fair at the end of the eclipse. Temperature was 20°F. The timing and data were recorded by Eliot Sterling. The U.T. was checked with CHV, good to ±1 second. Calibration of the clock with CHV was done by Lawrence Sterling. Confidence level: uncertain--this series was her first try at any kind of night-time variable star observing type of observation. She is a visual solar observer. Her observations were made by assigning the following step values to the satellites: III=0, I (at maximum)=3, II=7, and IV=10.

U.T. h m s	Brightness Step	U.T. h m s	Brightness Step
0:15:00	3	0:35:30	20
0:16:00	4	0:36:00	22
0:17:00	4	0:36:30	25
0:18:00	4	0:37:00	>25
0:19:00	4	0:44:30	25
0:20:00	4	0:45:00	19
0:21:00	4	0:45:30	16
0:22:00	4	0:46:00	14
0:23:00	4	0:46:30	13

U.T. h m s	Brightness Step	U.T. h m s	Brightness Step
0:24:00	4	0:47:00	12
0:25:00	5	0:47:30	11
0:26:00	4	0:48:00	10
0:27:00	4	0:48:30	9
0:28:00	4	0:49:00	8
0:29:00	5	0:49:30	7
0:29:30	5	0:50:00	7
0:30:00	6	0:50:30	6
0:30:30	5	0:51:00	6
0:31:00	6	0:51:30	6
0:32:00	7	0:52:00	5
0:32:30	8	0:52:30	5
0:33:00	9	0:53:00	4
0:33:30	11	0:53:30	4
0:34:00	12	0:54:00	3
0:34:30	14	0:54:30	3
0:35:00	18		

Also on the same date, November 20, 1973, John E. Bortle was observing the eclipse of I by the shadow of III. He was using his 12-1/2-inch reflector at Stormville, N.Y. at 55X and 88X. Seeing was 2-3 on a scale of 0-5. Transparency = 6 1/2 limiting magnitude. Observations were recorded by tape recorder simultaneously with CHV time signals. Maximum predicted eclipse was about 90% total. Comparison stars: satellite II=5.2 mg., SAO #163770=8.2 mg., SAO #163754=9.0 mg. It should be noted that the phenomenon was only partially observed. Mr. Bortle's observations are as follows:

U.T.	Recorded Remarks	Magnitude
0:36.0	Tape and observations started.	--
0:37.8	Satellite I noted already to be deep in eclipse.	--
0:38.2	Fading rapidly, magnitude 9-10.	10.0
0:38.7	Satellite nearing limit of instrument at 88X.	>11.0
0:39.3	Satellite at extreme limit of vision.	>12.0
0:39.6	Satellite visible only in glimpses.	>12.0
0:40.2	Satellite remains just visible. Probably 12th mag.	12.0
0:40.7	Somewhat brighter? Very deep bluish-gray in color.	--
0:41.5	Satellite definitely gaining in brightness, mag. about 11.5.	11.5
0:42.0	Satellite now easy to 88X.	--
0:42.1	Satellite is noted to gain in brightness from moment to moment.	--
0:43.0	Magnitude from actual comparison.	10.5
0:44.2	Magnitude from actual comparison.	9.5
0:45.4	Magnitude from actual comparison.	8.8
0:47.3	It is difficult to judge the actual brightness of the satellite because of its proximity to Jupiter.	--
0:47.7	Magnitude from comparison.	8.0
0:49.0	Satellite I judged to be one mag. fainter than II.	6.2
0:50.3	Satellite I judged to be 0.5 mags. fainter than II.	5.7
0:52.5	Satellite I=II.	5.2
0:54.5	Satellite I is 0.2 mags. brighter than II.	5.0
0:56.2	Satellite I at normal brightness.	5.0
0:56.3	Observations terminated.	

Mr. Bortle comments: "Even though much of the descending branch of the light curve is missing, mid-eclipse can still be fairly accurately defined using the verbal descriptions and the actual magnitude estimates. Based on the available observations, I would say mid-eclipse occurred at 0:39.8 ±1.0 minutes, U.T. This result gives an O - C of - 5 minutes."

Postscript by Editor. We hope that readers have enjoyed Mr. Budine's detailed discussion of some observed Jovian mutual satellite phenomena. Perhaps we shall be better prepared for the next "season" of such events *circa* 1979. If any observers have unreported 1973 or 1974 observations of satellite mutual occultations or eclipses, Mr. Budine would still like to receive them.

THE 1965-66 EASTERN (EVENING) APPARITION OF VENUS

By: Julius L. Benton, Jr., A.L.P.O. Venus Recorder

Foreword by Editor. Our late colleague, Dave Barcroft, was scarcely known as an observer of Venus. Nevertheless, he did observe Venus systematically during the favorable evening apparition in the spring of 1940, and his notes and sketches were of much interest to Frank Vaughn and other early A.L.P.O. students of Venus. In truth, he recorded many of the phenomena found by oldtime observers of Venus, including the delicate "ashen light" or visibility of the unilluminated hemisphere about the reality of which the Editor was very skeptical until he recorded it himself a number of years later.

We are sorry, of course, for the greatly delayed appearance of this Venus Report. Nevertheless, the subjects it describes are still subjects of current observation; and Dr. Benton, our Venus Recorder, will warmly welcome new members desiring to participate in Venus Section programs.

Introduction

The 1965-66 evening apparition of the planet Venus included the period from 1965, April 12, (superior conjunction) to 1966, January 26 (inferior conjunction). The planet reached greatest eastern elongation (47°) on the 15th of November, 1965, at which time Venus exhibited an apparent visual magnitude of -4.1. Greatest brilliancy was attained on 1965, December 21, the 27% illuminated crescent having a visual magnitude of -4.4 on that date.

The following thirteen individuals contributed observational material to the Venus Section throughout the 1965-66 period:

Observer	Location	Number of Observations	Instrumentation
Anderson, Carl A.	Manchester, New Hampshire	4	6" (15cm) Refl.
Baldwin, Rand	Florala, Alabama	4	6" (15cm) Refl.
Capen, Charles F.	Flagstaff, Arizona	4	4" (10cm) Refr. 6" (15cm) Refr. 16" (40cm) Refl.
Delano, Kenneth J.	New Bedford, Massachusetts	7	12 1/2" (31cm) Refl.
Heath, Alan W.	Nottingham, England	6	12" (30cm) Refl.
Haas, Walter H.	Las Cruces, New Mexico	2	12 1/2" (31cm) Refl.
Lazor, Fred	Victoria, Texas	45	2.4" (6cm) Refr.
Melville, E. C.	Jamaica, West Indies	9	9 1/2" (24cm) Refl.
Rea, Raymond	Detroit, Michigan	15	6" (15cm) Refl.
Ricker, Charles L.	Marquette, Michigan	2	6" (15cm) Refl.
Simmons, Karl	Jacksonville, Florida	12	6" (15cm) Refl.
Smith, Douglas	Vinton, Virginia	43	6" (15cm) Refl.
Suarez, Michael	Astoria, New York	1	2.4" (6cm) Refr.

A total of 154 observations were received from the persons listed above, and attention should be given to the following distribution of submitted reports by month:

1965, April	0	1965, September	8
May	0	October	28
June	9	November	40
July	10	December	39
August	9	1966, January	11

As may be seen from the above analysis, most observations were made during the months of October, November and December; very early portions of the apparition were not given much attention. The Recorder would like to express his sincere gratitude to those individuals mentioned in this report for their continued interest and active participation.

Visual Observations of Surface Details

The conventional method of studying visually the elusive markings of Venus in detail involves making a continuous series of drawings of the planet, recording any apparent or suspected detail visible at visual wavelengths with the greatest possible care and objectivity. Over the years, it has been possible to determine that markings drawn frequently by A.L.P.O. observers may be placed roughly into the five basic categories described below:

1. Banded dusky markings (dusky streaks which characteristically run nearly parallel with one another across the illuminated portion of the planet's disc).

2. Radial dusky markings (typically bear a resemblance to the spider's web pattern).

3. Irregular dusky markings (elongated or roughly linear streaks exhibiting no specific pattern).

4. Amorphous markings (dusky features showing no recognizable form or any definite pattern).

5. Bright spots or regions (excluding the cusps and cusp-caps, these are brightenings which usually appear much lighter in intensity than the surrounding portions of the illuminated disc).

Recent investigations have demonstrated that there is little correlation between markings visible in ultraviolet light and those noted at longer wavelengths. Indeed, until about 1972 few markings were photographed at the longer wavelengths at all; and those that were recorded exhibited a distinctly different character. Studies of the wavelength dependence of markings on Venus with narrow-band interference filters have indicated that the contrast of the features drops off rather sharply at wavelengths longward of about 3800 Å, becoming almost zero at 4200 Å. This upper limit is fairly close to the lower limit of visibility of the average human eye, probably precluding their visibility to the normal visual observer. It is possible, however, that the rare yellow markings may be seen readily by the experienced eye, but much depends upon the contrast conditions at the time of observation. Ideally, one would prefer to attempt visual work during the daylight hours.

An examination of the observational record over the years indicates very strongly that the amorphous markings, bright regions, irregular dusky streaks and parallel banded features appear visually to the systematic observer at optimum contrast conditions, while the radial dusky streaks typically are revealed in ultraviolet photographs. It is already apparent that there is a need for both types of observations, and it may be considered worthwhile to try to establish any true correlation between reports. As has been recommended very strongly, ultraviolet photography should be considered the ultimate goal of any serious research program; and any attempt to obtain simultaneous identifications of features in different wavelengths should not be ignored.

For this apparition, there were no ultraviolet photographs received by the Venus Section for study in relation to drawings made at visual wavelengths. The report that is presented here, therefore, must necessarily depend upon the work obtained from the visual observer. No instance of simultaneous observations of surface markings by different observers has been noted; and as a consequence, the author has attempted to assemble the contributed data as effectively as possible in light of the overall lack of continuity of observational results.

An exhaustive analysis of the tremendous variety of sketches and drawings of Venus contributed to the Section during the 1965-66 apparition revealed that nearly every type of marking previously described in this report was represented, with the one possible exception of the curious radial pattern which is so frequently found at ultraviolet wavelengths.

Banded shadings were often observed by individuals with and without the use of color filters, most of these features running almost parallel with each other and perpendicular to the line of the cusps (Capen, Rea, Smith). It was noted further that these rather vague markings were most commonly detected when violet (Wratten 47) and blue (Wratten 38A) filters were employed. Those using red (Wratten 25) and green (Wratten 57) filters reported that the markings were less obvious (Capen). At violet and blue regions of the spectrum, it was the distinct impression of a number of individuals that the banded shadings expanded and blended in with one another as they approached the vicinity of the planet's terminator, forming on occasion a grayish border to that feature; the latter effect was not apparent at other visual wavelengths (Capen).

As was stated earlier, no one submitted ultraviolet photographs or any drawings which even suggested the presence of the radial dusky streaks on the surface of the illuminated portion of Venus.

Numerous shaded bands and streaks were visible in integrated light and with the use of color filters, the great majority of these features taking on various orientations on the visible surface of the planet. Several individuals reported that banded structures were seen extending from cusp to cusp across the planet (Ricker). With less certainty, other observers detected a few somewhat linear shadings on Venus, none of which appeared to fit any well-defined pattern.

Vague, grayish patches, many undoubtedly the result of slight differences in intensity between adjacent regions on the illuminated portion of the planet, were described by observers. Most of the amorphous features were located in close proximity to the terminator or sometimes were blending in with the suspected terminator shading (Simmons, Anderson, Rea, Delano). Although a few individuals employed a blue filter to see them, the majority of observers reported that these markings were easily seen without any filter.

Exclusive of the suspected cusp brightenings and cusp-caps, there were a few instances wherin observers reported bright patches on the planet, usually taking on the form of moderately large, oval or irregular masses adjacent to the planet's bright limb or the terminator (Anderson, Capen). Most individuals noted that the bright spots began to appear up to and around the time of dichotomy, several persons indicating that it was difficult to tell whether the brightness of these features was absolute or an effect associated with an abnormal intensity of adjacent areas.

Accompanying the discussion presented previously are a number of selected sketches and drawings which should serve to illustrate effectively the various types of features noted by visual observers of Venus. See Figures 2, 3, 4 and 5. It is extremely important that one realise the very great amount of variability between drawing styles and the manner in which different individuals see the elusive markings on the planet. These factors substantially add to the difficulty encountered when one attempts to compare the results of many different observers. Every possible effort has been made by the author to try to establish some degree of continuity among the drawings selected, and it is usually possible to place a higher level of confidence in the findings as a result.

Cusps, Cusp-Caps, and Cusp-Bands

Prominent bright areas, normally located in the same relative proximity as the cusps of Venus, frequently appear when the computed phase value of k_c falls somewhere between 0.8 and 0.1, where k_c is the ratio of the illuminated disc to the whole disc regarded as circular. These "cusp-caps" have long been subjects of great controversy, for it was not known whether the phenomena resulted from a contrast effect or were indeed genuine; it is now known that at least some observations at visual wavelengths can be confirmed by ultraviolet photography.

There were several observations of cusp-caps and related brightenings throughout the 1965-66 period, and the following collection of reports should

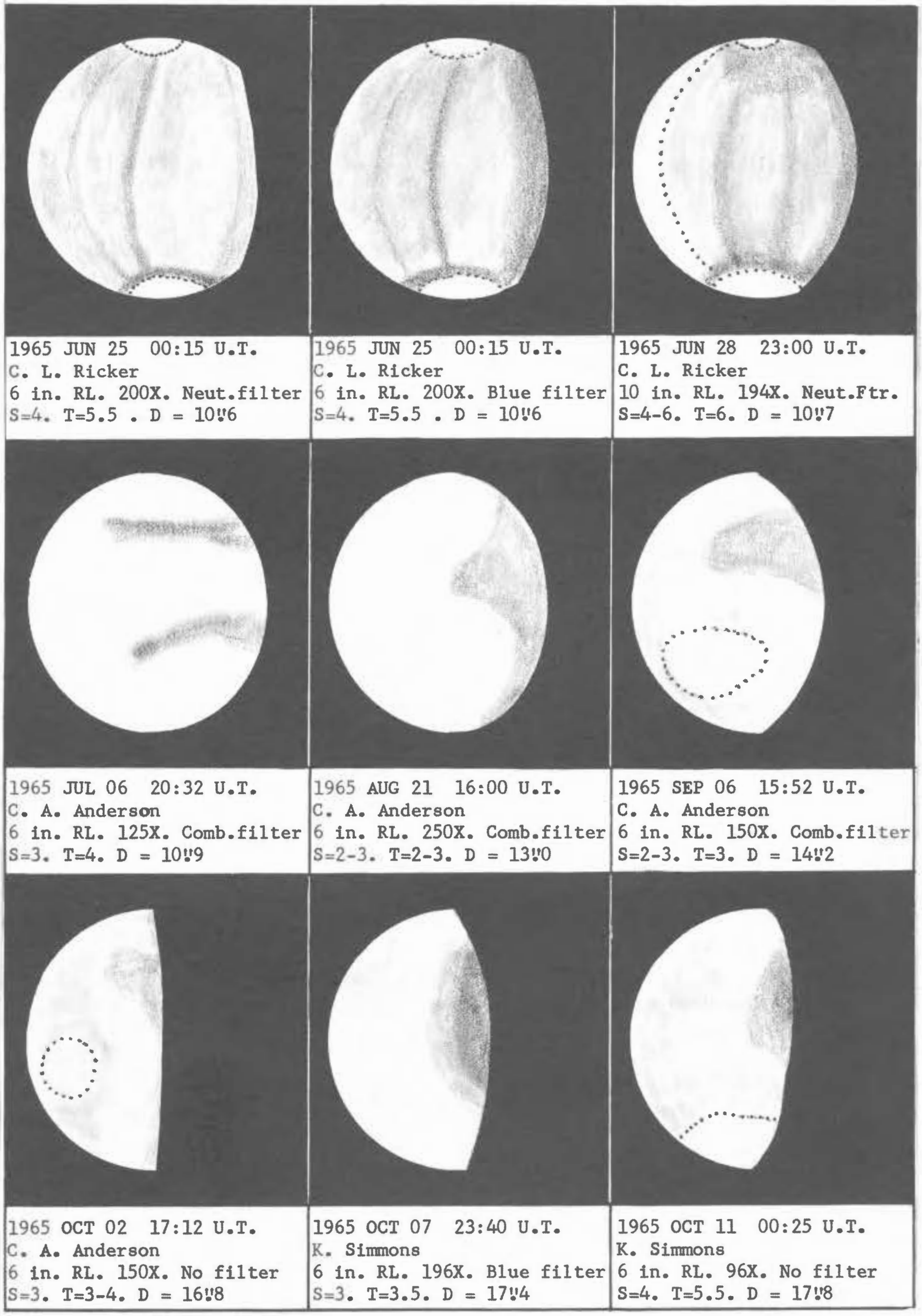


Figure 2. Representative drawings of Venus during its 1965-66 evening apparition by members of the A.L.P.O. Venus Section. Simply inverted views with south at the top. U.T. is Universal Time. S is seeing on a scale of 0 to 10 with 10 best. T is transparency as the estimated limiting stellar magnitude. D is apparent angular diameter. Abbreviations used: RL=reflector, RR=refractor, FTR=filter, Comb. filter=combination of filters. See also text of Dr. Benton's Venus Report. Figures 2, 3, 4 and 5 were arranged for publication here by Dr. John E. Westfall.

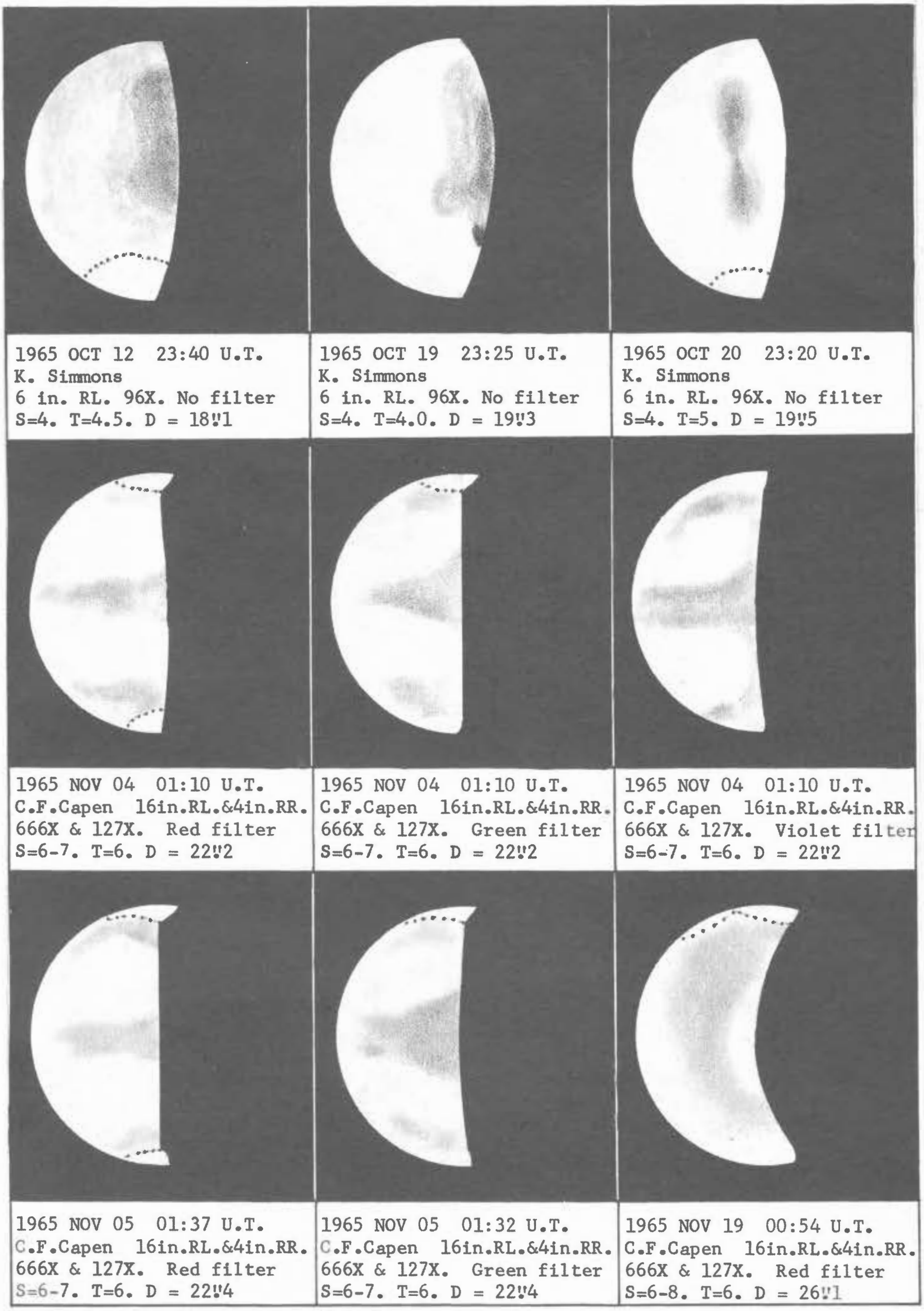


Figure 3. Representative drawings of Venus during its 1965-66 evening apparition by members of the A.L.P.O. Venus Section. See also caption of Figure 2 and text of Venus Report. Arranged for publication by John E. Westfall.

prove of interest; in addition, for a more meaningful understanding one should refer to the illustrations (Figures 2-5) presented along with this report:

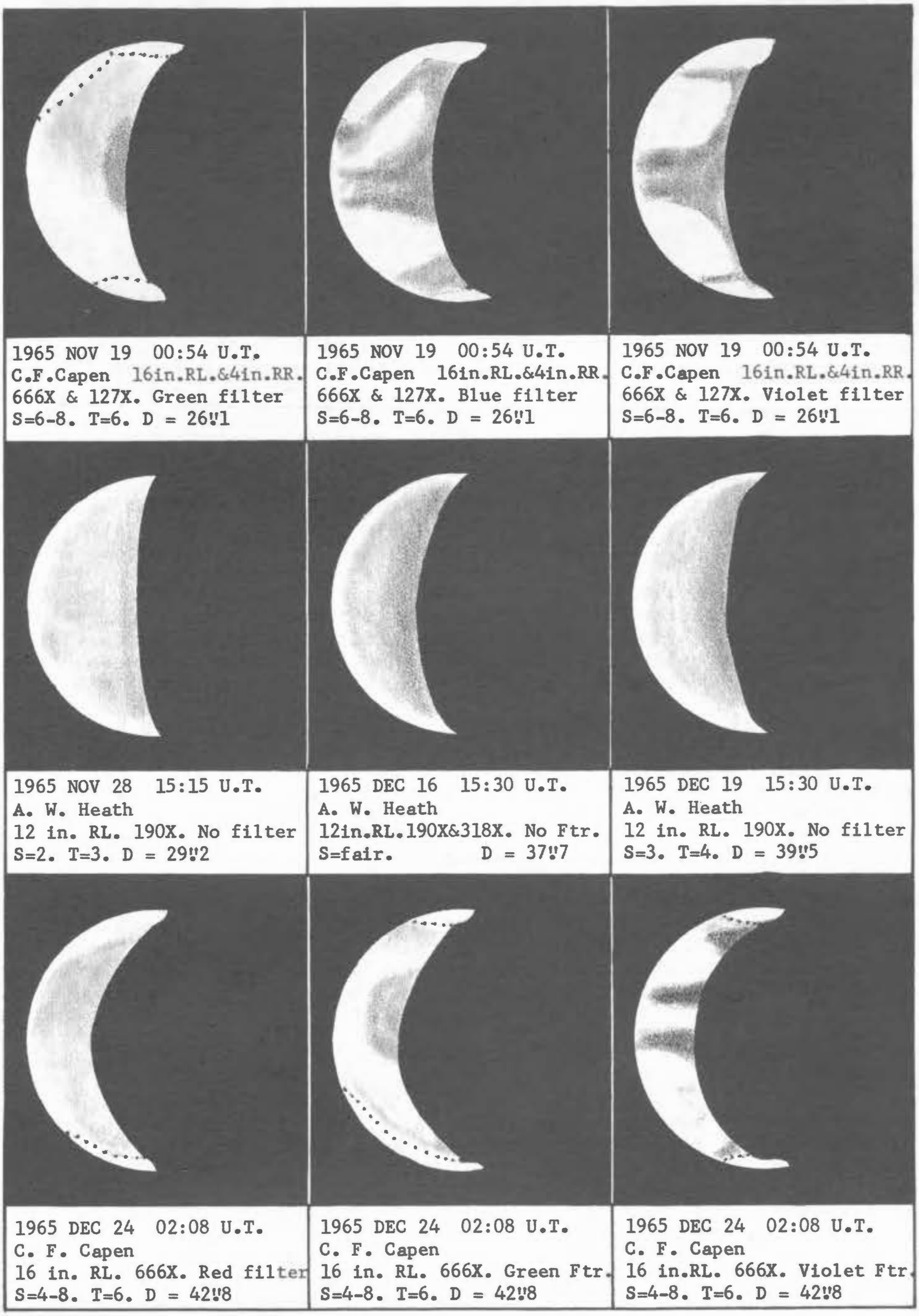


Figure 4. Representative drawings of Venus during its 1965-66 evening apparition by members of the A.L.P.O. Venus Section.

1965 June 25^d 00^h 15^m UT, 6" reflector, 200X, seeing 4.0(Ricker). In integrated light, both the northern and southern cusp-caps were easily visible, the one in the north appearing much more prominent than its southern counterpart. The estimated intensities were 9.8

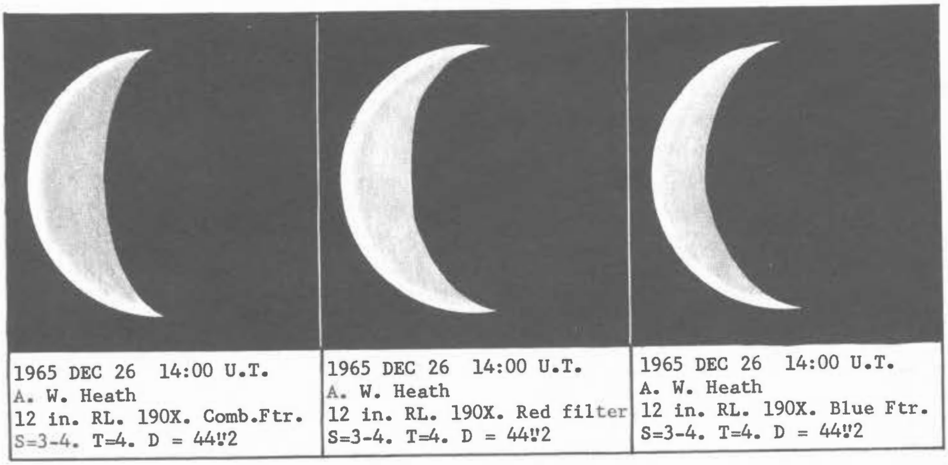


Figure 5. Representative drawings of Venus during its 1965-66 evening apparition by members of the A.L.P.O. Venus Section. See also caption of Figure 2 and text of Venus Report. Arranged for publication by John E. Westfall.

and 9.6, respectively, on the numerical A.L.P.O. scale. Surrounding the northern cusp-cap was a grayish band of fairly narrow width. With a violet (Wratten 47) filter, the northern cusp-cap decreased in brightness. The scale mentioned ranges from 0 (black shadows) to 10 (most brilliant features).

1965 June $28^d\ 23^h\ 00^m$ UT, 6" reflector, 194X, seeing 4.0 to 6.0 (Ricker). The north and south cusp-caps were again seen quite easily, the northern one being definitely the brighter with no filter and when using red (Wratten 25), violet (Wratten 47) and green (Wratten 58) Wratten series. A dark border surrounding each cusp-cap was observed, the one associated with the northern cusp-cap having a much darker and narrower appearance.

1965 October $11^d\ 00^h\ 25^m$ UT, $12^d\ 23^h\ 40^m$ UT, and $20^d\ 23^h\ 20^m$ UT, 6" reflector, 96X, no filter, seeing 4 on all dates (Simmons). The northern cusp-cap was detected on three occasions during the month of October, located in the same region and maintaining approximately the same size and brightness. There was no evidence of a southern counterpart on any of the dates.

1965 November $04^d\ 01^h\ 04^m - 15^m$ UT, 16" reflector, 666X, 4" refractor, 127X, seeing 6.0 to 7.0 (Capen). Northern and southern cusp-caps were visible in a red (Wratten 25) filter, while the southern one was the more obvious in green (Wratten 58) light. Using the violet (Wratten 47) filter, one could only barely detect either of these features.

1965 November $05^d\ 01^h\ 05^m - 02^h\ 10^m$ UT, 16" reflector, 666X, 4" refractor, 127X, seeing 6.0 to 7.0 (Capen). The same impression was apparent on this occasion that was noted on 1965 November $04^d\ 01^h\ 04^m - 15^m$ UT. The northern and southern cusp-caps were seen to advantage in the red (W 25) filter, but only the southern one was visible in green (W58) light.

1965 November $19^d\ 00^h\ 30^m - 01^h\ 17^m$ UT, 16" reflector, 666X, 4" refractor, 127X, seeing 6.0 to 8.0 (Capen). With the red (W 25) filter only the southern cusp-cap was visible, expanded somewhat and extending down the limb of the planet to form a bright, amorphous patch. In the green filter (W 58) the same effect was noted with respect to the southern cusp-cap, but in addition the northern counterpart was detected. In the violet (W 47) filter and blue (W 38A) filter, the cusp-caps were seen; but they were not so prominent as was the case at longer wavelengths. The expansion of the southern cusp-cap described above was detected with the blue (W 38A) filter, but the effect was not observed in violet light.

1965 December 24^d 01^h 50^m - 02^h 25^m UT, 16" reflector, 666X, seeing 4.0 to 8.0 (Capen). The northern and southern cusp-caps varied in size and brightness in accordance with the color filter used, as was the case in the preceding observations of October and November. Both cusp-caps were very bright on occasions when the green (W 58) filter was utilized, the northern one expanded and extending along the planet's bright limb for a short distance. In red light (W 25) the expansion of the northern cusp-cap was not so apparent, but the feature remained fairly bright; the southern cusp-cap was much less obvious. In violet light (W 47) both cusp-caps were reduced in size; but again, they were bright.

An examination of the drawing contributed by Capen on 1965 November 04 reveals a slight extension of the southern cusp in green (W 58) and red (W 25) light. In addition, slight extensions were reported by the same observer on 1965 November 05, November 19 and December 24; these cusp-extensions were most obvious in green (W 58), violet (W 47) and blue (W 38A) filters, although on 1965 November 05 the cusp-extensions were noted with the red (W 25) filter. Reference to Figures 3 and 4 should help clarify this discussion. No other observers submitted material which indicated with confidence that cusp-extensions were apparent. It may be of interest to note that the difference in size of the northern and southern cusp-caps is apparently related to the cusp-extensions described here. Perhaps in the future it may be considered worthwhile to attempt careful measurements or estimates of the angle from the geometric true cusp to the tip of the visible extension as subtended at the center of the planet's disc. [A number of such observations have been made in the past.--Editor].

Bright Limb Band

Almost certainly an effect of contrast, the bright limb band was reported on a few occasions during the apparition. On 1965 June 25^d 00^h 15^m and June 28^d 23^h 00^m Ricker recorded a slightly brighter limb region at the computed phase value of k_c=0.933. In the past, most reports of this phenomenon were at times when the value of k_c was between 0.8 and 0.2. On 1965 November 10^d 21^h 50^m UT and on December 09^d 21^h 50^m UT, Delano contributed additional observations of a bright limb band. He pointed out that the feature was plainly seen in integrated light and with the use of a violet (W 47) filter. Heath was another individual who described the brighter limb regions, using a variety of color filters. It may be of interest if we examine his results more closely:

		Dufay Tricolor Filter Series		
UT Date	No Filter	Red (7200 Å)	Green (5300 Å)	Blue (4200 Å)
1965 November 21^d 16^h 10^m-30^m UT Seeing poor 12" reflector 190X	limb brighter than disc of planet	limb brighter than disc of planet	limb brighter than disc of planet; contrast enhanced	limb brighter than disc of planet; more extended onto disc
1965 November 28^d 15^h 15^m UT Seeing fair 12" reflector 190X	limb brighter than planet's disc	limb brighter than planet's disc	limb brighter than planet's disc	limb brighter than planet's disc
1965 December 16^d 15^h 30^m UT Seeing fair 12" reflector 190X	limb bright from cusp to cusp	limb bright from cusp to cusp	limb bright from cusp to cusp	limb bright from cusp to cusp; width of band much narrower

UT Date	No Filter	Dufay Tricolor Filter Series Red (7200 Å)	Green (5300 Å)	Blue (4200 Å)
1965 December 19^d 15^h 15^m UT Seeing fair 12" reflector 190X	limb bright from cusp to cusp	limb bright from cusp to cusp	limb bright from cusp to cusp	limb bright from cusp to cusp
1965 December 26^d 14^h 00^m-20^m UT Seeing fair 12" reflector 190X	limb band is brighter than disc, running from cusp to cusp; narrow	limb band is brighter than disc, running from cusp to cusp; narrow	limb band is brighter than disc, running from cusp to cusp; narrow	limb band is brighter than disc, running from cusp to cusp; narrow

One notes that Heath observed the limb band throughout those months in which he made observations, and his drawings show that it runs consistently from cusp to cusp. The seeing conditions, he remarked, were never really very good; but the bright limb band was always fairly obvious. Selected drawings by Heath accompany this presentation (Figures 4 and 5). No other observer attempted such a colorimetric study of this phenomenon during the apparition. In past observing periods, it has been suspected that the variable density of different color filters may have an effect on the contrast and thus on the visibility of the phenomenon. It would be interesting if other individuals would attempt this kind of work in the future.

Irregularities on the Terminator

The boundary separating the light and dark hemispheres of Venus is known as the terminator, ideally a perfect, smooth half-ellipse, entirely symmetrical with the apparent equator of the planet. The basic shape of the terminator changes in accordance with phase changes, but other irregularities have been reported from time to time which are certainly beyond what might be expected.

Localized deformations in the terminator of the planet, frequently described as "dents" or "bumps" along the otherwise straight or curved line (depending on the phase), were noted on at least one occasion during the 1965-66 apparition (Heath). Observing with a 12" Newtonian at 190X under fair seeing conditions, Heath reported that the terminator exhibited a very obvious irregularity in the form of an "elbow" on each side of the middle, the remainder of the terminator appearing more or less straight on either side of the deformity and away from the cusps. The same individual, who made the initial observation without the use of a filter, employed red, green, yellow and blue filters of the Dufay Tricolor series, obtaining the same results as noted in integrated light.

Nearly every observer detected terminator shading, but the majority of individuals agreed that it was most evident in a blue or violet filter (Capen, Delano, Heath). A curious blending of the dusky markings with the grayish border of the terminator was also observed, again most obvious at shorter wavelengths (Capen).

Observational evidence suggests that the appearance of the terminator in different color filters varies, and one is led to the assumption that image contrast is strongly dependent upon the transmission characteristics of the filter employed. However, it is entirely possible that the effect noticed is not actually due to the color of the filter itself, but is instead a result of the actual density of the filter. As more individuals attempt colorimetric observations of Venus, we will be in a much better position to investigate in detail the variable factors associated with such work.

The Ashen Light and Other Dark-Side Phenomena

Throughout the 1965-66 apparition there were no confirmed reports of the ashen light or any other unusual dark-side phenomena, but a few observers suspected anomalies:

1965 September 18^d 23^h 30^m-50^m UT, 6" reflector, 200X, seeing 5.0, twilight sky (Smith). Perhaps due only to contrast, the dark side of Venus appeared a bit darker than the surrounding sky; this was seen only with difficulty.

1965 December 26^d 00^h 00^m-04^m UT, 12 1/2" reflector, 404X, seeing 3, twilight sky (Haas). The entire dark hemishpere of the planet was faintly suspected, probably uniform in tone; whether it was brighter than the surrounding sky, one could not say with confidence. The dark hemisphere was not suspected with red (W 25) and violet (W 47) filters.

In general, any faint illumination of the dark side of Venus, if present, is most difficult to detect; it is quite rare, and necessarily requires that the planet be viewed against as dark background sky as possible. The contrast of the extremely bright hemisphere of Venus with the dark side makes observations of such phenomena almost impossible unless one is equipped with an eyepiece containing a crescentic occulting bar. Simultaneous reports are of extreme value in this aspect of Venus studies, which hence indicates a continuous need for individuals to attempt to observe at about the same time.

Phase and Dichotomy Observations

The observed phase of the planet Venus is often a little different from the predicted phase in The American Ephemeris and Nautical Almanac, this discrepancy being most easily detected at half-phase or dichotomy. a The variability between the dates of observed and predicted dichotomy constitutes the Schröter Effect, named after the scientist who discovered it. The difference between the two values is normally from about four to ten days.

The predicted date of dichotomy from the Ephemeris was 1965, November $15^d.0$; and the date of dichotomy derived from the probability-estimate technique was 1965, November $7^d.5$, yielding a discrepancy of 7.5 days. The probability-estimate technique is described in JALPO, Vol. 18, Nos. 11-12, pp. 228-230, 1965. Since there were only a very few observations which contained such estimates, it is perhaps best if we place only limited confidence in these findings.

Conclusions

As can be seen from this report, the planet Venus received only a limited amount of attention during the 1965-66 apparition. It is of utmost importance that observers try to keep the planet under close surveillance at every available opportunity, and a truly enthusiastic effort to obtain simultaneous observations is certainly warranted.

Since the author assumed the post of Venus Recorder in late 1972, it has been most urgent that the Section be completely reorganized, with an energetic attempt to alleviate the considerable backlog of unpublished apparition reports on Venus in a minimum of time. The present paper is the second of several which will be appearing in this Journal for observations over a number of years prior to 1972. The present Recorder must apologize for the long delay in the publication of these reports.

A new observing guide for Venus, along with a generous supply of new forms, is now available from the Recorder in the form of the Venus Observing Kit, priced at $2.00. Persons interested in a simultaneous observing program for the planet should contact the author immediately. Your interest and support will be welcomed.

Postscript by Editor. Having passed superior conjunction on November 6, 1974, the planet Venus in 1975 will reach greatest elongation east on June 18, inferior conjunction on August 27, and greatest elongation west on November 7. It will thus be well placed in the spring evening sky and later in the autumn morning sky for northern hemisphere observers.

LUNAR NOTES

By: John E. Westfall, A.L.P.O. Lunar Recorder

Foreword by Editor. David P. Barcroft was first and foremost an observer of the Moon in his astronomical efforts. This statement cannot be properly understood unless one first appreciates the neglect suffered by the Moon and the bright planets from professional astronomers over the interval, say, of 1925 to 1955. He appeared to regard his role and that of his fellow amateurs in lunar studies as a kind of caretaker operation, until professional research astronomers should again devote their superior instruments and abilities to the Moon. His own knowledge of past lunar studies became considerable; it may suffice to say that it earned him the respect and admiration of Dr. Dinsmore Alter, long the Director of the Griffith Planetarium in Los Angeles. Dave Barcroft shared his astronomical books, articles and magazines, some of them rare, valuable, and out of print for many years, with all who showed a serious interest. Often he would simply make gifts of such items to some astronomical colleague, with a brusque explanation that it was too troublesome to mail back the book or to return the fool thing to his library shelves.

It is perhaps inevitable that an oldtime amateur like Dave Barcroft would have some misgivings about the value of the American space program of the 1960s. We suspect that he derived some unexpressed pleasure from the fact that a small portion of the Moon remained unexplored after this massive effort. That small portion, "Luna Incognita," is the subject of Dr. John Westfall's discussion below. If a new generation of lunar observers study Luna Incognita with one-tenth the devotion which Dave gave to other Moon projects in his time, the name will soon be most inappropriate.

Luna Incognita for 1975

Program Summary

The purpose of the A.L.P.O. "Luna Incognita" Program, begun in 1972, is to map that portion of the Moon which was not adequately photographed by the Orbiter and Apollo Missions (Refs.: JALPO, 23 (1972), 118-22, 134-36; 24 (1973), 20-22, 184-87). This region includes the south polar zone (approximately 82°-90°S) and the "marginal zone" of the (IAU) southwest limb (from latitudes 52°-82°S, and approximately from longitude 95°W to the limits of visibility).

Since the last report, three observers have made contributions to the program:

Alain C. Porter (6" Refl.) .... 1 drawing
Richard J. Wessling (12 1/2" Refl.) .... 1 drawing, 3 photographs
John E. Westfall (10" Refl.) .... 9 photographs.

Also since the last report, the writer has constructed a preliminary positional map for this region and its vicinity, using both "conventional" photographic positions (LPL Commun., 1, No. 11, "Consolidated Catalog of Selenographic Positions," D.W.G. Arthur, 1962) and computer-transformed position angles and librations of limb elevations (Astron. Papers Prepared for the Use of the A.E.N.A., XVII, "The Marginal Zone of the Moon," U.S. Nautical Almanac Office, 1963). This preliminary grid (stereographic projection; scale 1:2,500,000) will be used for the insertion of detail from the drawings and photographs of ALPO members, and from Lunar Orbiter photographs, so that outline forms, for use at the telescope, can be prepared.

In order to prepare such outline charts (and, ultimately, a final topographic map), more ALPO observations are needed. Such observations should be communicated to the writer and can take the form of drawings or photographs.

Drawings should be done at a fairly large scale (e.g., 50 in. to the Moon's diameter); and the portion of the limb so sketched should be clearly indicated (e.g., with one or more named features). Outlines of features can be obtained by tracing from a large-scale lunar photographic atlas, providing that the photograph's colongitude and librations are similar to those at the time of observation.

Photographs should also be large-scale (not whole-disk) and may take the form of negatives, positive slides, or enlargements (preferably 8X10 inch). A recommended film is Kodak Photomicrography Color Film 2483, a high-resolution, 35mm positive, high-contrast film on highly-stable ESTAR base.

Times accurate to one minute must be supplied with each photograph or sketch. Photographers with calculating ability can also be supplied with "A.L.P.O. Lunar Photograph Supporting Data" forms, which allow conversion from geocentric to topocentric librations.

Luna Incognita Observing Schedule, 1975

The following table gives those dates in 1975 when at least part of "Luna Incognita" will be well-presented, with favorable lighting and libration. The south polar zone is readily visible (i.e., with the south pole tilted at least 5° toward Earth) for a period in every lunation. However, the solar altitude is always low for this region, and best viewing is obtained when the solar latitude is negative (South; ~~see~~ also Note 2 at the end of this Report). The area "beyond" the southwest limb is less often visible; for this latter region, a combination of southerly (negative) latitude and westerly (negative) longitude libration is desirable. In the following table:

1. All data are for 0^h U.T.
2. Asterisked (*) colongitudes indicate a low to medium Sun angle for the southwest marginal zone. (The Sun is always low for the south polar zone.)
3. The Earth's selenographic latitude/longitude are geocentric.
4. "Latitude Zone" indicates the approximate range of (southerly) latitudes visible in "Luna Incognita." "SPZ" refers to the south polar zone. For reference, the latitudes of some prominent craters adjoining "Luna Incognita" are:

   Pingré........ 52°-61° S
   Bailly........ 62-72
   Hausen........ 62-68
   Legentil...... 72-77
   Drygalski..... 77-82

1975 Date		Solar Colong.	Solar Lat.	Earth's Selenographic Latitude	Earth's Selenographic Longitude	Latitude Zone (all Lats. South)
JAN.	15	298°	+ 1°1	- 6°	0°	SPZ
	16	311	+ 1.1	- 7	- 1	SPZ
	17	323	+ 1.2	- 7	- 3	SPZ
	18	335	+ 1.2	- 6	- 4	SPZ
	19	347	+ 1.2	- 6	- 5	SPZ
FEB.	08	230°*	+ 1°5	- 4°	+ 4°	65°-SPZ
	09	242 *	+ 1.5	- 5	+ 3	60°-SPZ
FEB.	13	291°	+ 1°5	- 7°	- 2°	SPZ
	14	303	+ 1.5	- 6	- 3	SPZ
	15	315	+ 1.5	- 6	- 4	SPZ
MAR.	07	199°	+ 1°5	- 4°	+ 6°	70°-SPZ
	08	211	+ 1.5	- 5	+ 5	65°-SPZ
	09	223	+ 1.5	- 6	+ 3	60° SPZ
	10	235*	+ 1.5	- 6	+ 2	60°-SPZ
	11	247*	+ 1.5	- 7	+ 1	60°-SPZ

1975 Date		Solar Colong.	Solar Lat.	Earth's Selenographic Latitude	Earth's Selenographic Longitude	Latitude Zone (all Lats. South)
APR.	03	168°	+ 1°2	- 4°	+ 6°	70°-SPZ
	04	180	+ 1.2	- 5	+ 5	65°-SPZ
	05	192	+ 1.2	- 6	+ 4	60°-SPZ
	06	204	+ 1.1	- 6	+ 3	60°-SPZ
	07	216	+ 1.1	- 7	+ 2	60°-SPZ
	08	229*	+ 1.1	- 7	+ 1	60°-SPZ
	09	241*	+ 1.1	- 6	- 1	60°-SPZ
APR.	30	137°	+ 0°6	- 4°	+ 6°	70°-SPZ
MAY	01	149	+ 0.5	- 5	+ 5	65°-SPZ
	02	161	+ 0.5	- 6	+ 5	65°-SPZ
	03	173	+ 0.5	- 6	+ 4	60°-SPZ
	04	186	+ 0.5	- 7	+ 2	60°-SPZ
	05	198	+ 0.5	- 7	+ 1	60°-SPZ
	06	210	+ 0.4	- 7	0	60°-SPZ
	07	222	+ 0.4	- 6	- 1	60°-SPZ
	08	235*	+ 0.4	- 5	- 2	60°-SPZ
	09	247*	+ 0.4	- 4	- 3	60°-SPZ
MAY	27	107°*	- 0°2	- 3°	+ 5°	75°-SPZ
	28	119 *	- 0.2	- 4	+ 5	70°-SPZ
	29	131 *	- 0.2	- 5	+ 4	65°-SPZ
	30	143	- 0.2	- 6	+ 4	60°-SPZ
	31	155	- 0.3	- 7	+ 3	60°-SPZ
JUNE	01	168	- 0.3	- 7	+ 2	60°-SPZ
	02	180	- 0.3	- 7	0	60°-SPZ
	03	192	- 0.3	- 6	- 1	60°-SPZ
	04	204	- 0.3	- 6	- 2	60°-SPZ
	05	217	- 0.3	- 5	- 3	60°-SPZ
	06	229 *	- 0.4	- 4	- 4	60°-SPZ
	07	241 *	- 0.4	- 2	- 5	60°-SPZ
JUNE	25	101°*	- 0°9	- 5°	+ 4°	65°-SPZ
	26	113 *	- 0.9	- 6	+ 4	60°-SPZ
	27	125 *	- 0.9	- 6	+ 3	60°-SPZ
	28	138	- 1.0	- 7	+ 2	60°-SPZ
	29	150	- 1.0	- 7	+ 1	60°-SPZ
	30	162	- 1.0	- 6	- 1	60°-SPZ
JULY	01	174	- 1.0	- 6	- 2	60°-SPZ
	02	186	- 1.0	- 5	- 3	60°-SPZ
	03	199	- 1.0	- 4	- 4	60°-SPZ
	04	211	- 1.0	- 3	- 5	60°-SPZ
	05	223	- 1.0	- 1	- 6	60°-SPZ
	06	235 *	- 1.0	0	- 6	60°-80°
JULY	23	083°	- 1°4	- 6°	+ 4°	SPZ
	24	096°*	- 1.4	- 6	+ 3	60°-SPZ
	25	108 *	- 1.4	- 7	+ 2	60°-SPZ
	26	120 *	- 1.4	- 7	+ 1	60°-SPZ
	27	132 *	- 1.4	- 6	0	60°-SPZ
	28	144	- 1.4	- 6	- 1	60°-SPZ
	29	157	- 1.4	- 5	- 3	60°-SPZ
	30	169	- 1.4	- 4	- 4	60°-SPZ
	31	181	- 1.4	- 3	- 5	60°-SPZ
AUG.	01	193	- 1.4	- 1	- 6	60°-SPZ
	02	205	- 1.4	0	- 7	60°-80°
	03	218	- 1.4	+ 1	- 7	60°-70°
AUG.	19	053°	- 1°6	- 6°	+ 5°	SPZ
	20	065	- 1.6	- 6	+ 4	SPZ
	21	078	- 1.6	- 7	+ 3	SPZ
	22	090	- 1.6	- 7	+ 2	SPZ
	23	102 *	- 1.6	- 6	+ 1	60°-SPZ
	24	114 *	- 1.6	- 6	0	60°-SPZ
	25	126 *	- 1.6	- 5	- 2	60°-SPZ
	26	139	- 1.6	- 4	- 3	60°-SPZ
	27	151	- 1.6	- 3	- 4	60°-SPZ
	28	163	- 1.5	- 2	- 6	60°-SPZ
	29	175	- 1.5	0	- 7	60°-80°
	30	187	- 1.5	+ 1	- 7	60°-70°

1975 Date	Solar Colong.	Solar Lat.	Earth's Selenographic Latitude	Earth's Selenographic Longitude	Latitude Zone (all Lats. South)
SEP. 15	023°	- 1°.4	- 6°	+ 6°	SPZ
16	035	- 1.4	- 6	+ 6	SPZ
17	047	- 1.4	- 7	+ 4	SPZ
18	059	- 1.4	- 7	+ 3	SPZ
19	072	- 1.4	- 6	+ 2	SPZ
20	084	- 1.4	- 6	+ 1	SPZ
21	096 *	- 1.3	- 5	0	60°-SPZ
22	108 *	- 1.3	- 4	- 2	60°-SPZ
23	120 *	- 1.3	- 3	- 3	60°-SPZ
24	133 *	- 1.3	- 2	- 4	60°-SPZ
25	145	- 1.2	0	- 5	60°-80°
OCT. 12	352°	- 0°.9	- 6°	+ 7°	SPZ
13	004	- 0.9	- 6	+ 7	SPZ
14	017	- 0.9	- 7	+ 6	SPZ
15	029	- 0.8	- 7	+ 5	SPZ
16	041	- 0.8	- 7	+ 3	SPZ
17	053	- 0.8	- 6	+ 2	SPZ
18	065	- 0.8	- 5	+ 1	SPZ
OCT. 21	102°*	- 0°.7	- 2°	- 3°	60°-SPZ
22	114 *	- 0.7	- 1	- 4	65°-80°
NOV. 08	321°	- 0°.2	- 5°	+ 7°	SPZ
09	333	- 0.2	- 6	+ 7	SPZ
10	345	- 0.1	- 7	+ 6	SPZ
11	358	- 0.1	- 7	+ 5	SPZ
12	010	- 0.1	- 7	+ 4	SPZ
13	022	- 0.1	- 6	+ 3	SPZ
14	034	0.0	- 6	+ 2	SPZ
NOV. 19	095°*	+ 0°.1	+ 1°	- 4°	65°-80°
DEC. 06	302°	+ 0°.6	- 6°	+ 6°	SPZ
07	314	+ 0.6	- 6	+ 6	SPZ
08	326	+ 0.6	- 7	+ 5	SPZ
09	338	+ 0.7	- 7	+ 4	SPZ
10	350	+ 0.7	- 6	+ 3	SPZ
11	003	+ 0.7	- 6	+ 2	SPZ
DEC. 31	246°*	+ 1°.2	- 3°	+ 4°	65°-SPZ

Notes

1. Although the combinations of latitude and longitude libration will generally not be so favorable as for some periods in 1974, some 1975 dates will be particularly favorable:

   June 4, 5, 6 (low Sun).
   July 1, 2, 3, 4.
   July 29, 30, 31.
   August 28.

2. A range of high peaks in the Leibnitz Mountains (running in a curve from approximately 84°S/70°W to 80°S/88°E) often casts shadows over much of the south polar zone. Some of this area may be best seen when "backlighted"--between last quarter and first quarter--when the solar latitude is negative, and when the Earth's latitude is strongly negative. Dates in 1975 when these conditions occur are:

   June 2, 3, 4, 5.
   July 2 (most favorable).
   October 12 (most favorable).
   November 8, 9, 10, 11.

SATURN CENTRAL MERIDIAN EPHEMERIS: 1975

By: John E. Westfall

The two tables on this page and page 65 give the longitude of Saturn's geocentric central meridian (C.M.) for the illuminated (apparent) disk for 0^h U.T. for each day in 1975. These tables are a continuation of those for 1970-74 which have been previously published in the JALPO, and incorporate corrections for phase, light-time, and the Saturnicentric longitude of the Earth.

"System I" assumes a sidereal rotation rate of 844°.00/day (period= $10^h\ 14^m\ 13^s.1$), intended for use with features in the NEB, EZ, and SEB.

SATURN, 1975

LONGITUDE OF CENTRAL MERIDIAN OF ILLUMINATED DISK

SYSTEM I -- 0^h U.T.

Day	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEP.	OCT.	NOV.	DEC.
1	157°.7	043°.8	275°.6	157°.0	272°.8	151°.7	266°.9	146°.8	028°.1	147°.2	032°.0	154°.2
2	281.8	167.8	039.5	280.9	036.6	275.5	030.7	270.6	152.0	271.2	156.1	278.3
3	045.9	291.8	163.5	044.7	160.5	039.4	154.6	034.5	276.0	035.2	280.1	042.4
4	170.0	055.8	287.4	168.6	284.3	163.2	278.4	158.4	039.9	159.2	044.2	166.5
5	294.1	179.9	051.4	292.5	048.2	287.0	042.3	282.3	163.9	283.2	168.2	290.6
6	058.1	303.9	175.3	056.4	172.0	050.9	166.2	046.2	287.8	047.2	292.3	054.7
7	182.2	067.9	299.3	180.3	295.8	174.7	290.0	170.1	051.8	171.2	056.3	178.8
8	306.3	191.9	063.2	304.1	059.7	298.5	053.9	294.0	175.7	295.2	180.4	302.9
9	070.4	315.9	187.1	068.0	183.5	062.4	177.7	057.9	299.7	059.2	304.5	067.0
10	194.5	079.9	311.1	191.9	307.4	186.2	301.6	181.8	063.6	183.2	068.5	191.1
11	318.6	203.9	075.0	315.7	071.2	310.1	065.4	305.7	187.6	307.2	192.6	315.2
12	082.6	327.9	198.9	079.6	195.0	073.9	189.3	069.6	311.5	071.3	316.7	079.3
13	206.7	091.9	322.8	203.5	318.9	197.7	313.2	193.5	075.5	195.3	080.7	203.4
14	330.8	215.9	086.8	327.3	082.7	321.6	077.0	317.4	199.5	319.3	204.8	327.5
15	094.9	339.9	210.7	091.2	206.5	085.4	200.9	081.3	323.4	083.3	328.9	091.6
16	218.9	103.9	334.6	215.0	330.4	209.2	324.7	205.2	087.4	207.4	093.0	215.7
17	343.0	227.9	098.5	338.9	094.2	333.1	088.6	329.2	211.4	331.4	217.0	339.8
18	107.1	351.9	222.4	102.8	218.0	096.9	212.5	093.1	335.4	095.4	341.1	103.9
19	231.1	115.9	346.3	226.6	341.9	220.8	336.3	217.0	099.3	219.4	105.2	228.0
20	355.2	239.9	110.2	350.5	105.7	344.6	100.2	340.9	223.3	343.5	229.3	352.1
21	119.3	003.8	234.2	114.3	229.5	108.4	224.1	104.8	347.3	107.5	353.4	116.2
22	243.3	127.8	358.1	238.2	353.4	232.3	348.0	228.8	111.3	231.5	117.4	240.3
23	007.4	251.8	122.0	002.0	117.2	356.1	111.8	352.7	235.2	355.6	241.5	004.4
24	131.4	015.8	245.9	125.9	241.0	120.0	235.7	116.6	359.2	119.6	005.6	128.5
25	255.5	139.7	009.8	249.7	004.9	243.8	359.6	240.5	123.2	243.7	129.7	252.6
26	019.5	263.7	133.7	013.6	128.7	007.7	123.4	004.5	247.2	007.7	253.8	016.7
27	143.6	027.7	257.6	137.4	252.5	131.5	247.3	128.4	011.2	131.7	017.9	140.8
28	267.6	151.6	021.4	261.3	016.4	255.3	011.2	252.3	135.2	255.8	142.0	264.9
29	031.6	-----	145.3	025.1	140.2	019.2	135.1	016.3	259.2	019.8	266.0	029.0
30	155.7	-----	269.2	149.0	264.0	143.0	259.0	140.2	023.2	143.9	030.1	153.1
31	279.7	-----	033.1	-----	027.9	-----	022.9	264.1	-----	267.9	-----	277.2

MOTION OF THE CENTRAL MERIDIAN

01^h -- 035°.2	09^h -- 316°.5	17^h -- 237°.8	10^m -- 005°.9	01^m -- 000°.6
02 -- 070.3	10 -- 351.7	18 -- 273.0	20 -- 011.7	02 -- 001.2
03 -- 105.5	11 -- 026.8	19 -- 308.2	30 -- 017.6	03 -- 001.8
04 -- 140.7	12 -- 062.0	20 -- 343.3	40 -- 023.4	04 -- 002.3
05 -- 175.8	13 -- 097.2	21 -- 018.5	50 -- 029.3	05 -- 002.9
06 -- 211.0	14 -- 132.3	22 -- 053.7		06 -- 003.5
07 -- 246.2	15 -- 167.5	23 -- 088.8		07 -- 004.1
08 -- 281.3	16 -- 202.7	24 -- 124.0		08 -- 004.7
				09 -- 005.3

Figure 6

"System II," intended for the rest of the ball (excluding the NPR and the SPR), assumes a sidereal rotation rate of 812°00/day (period=10^h 38^m 25^s4). These rates are only approximations because latitude-dependent rotation rates for Saturn are more uncertain than, say, for Jupiter; but longitudes calculated from the accompanying tables should give conveniently small drift rates for most features. A.L.P.O. Saturn observers are urged to make central meridian timings, combined with latitude measures (or at least estimates) whenever possible, so that these rotation rates, and any future C.M. tables, can be made more accurate.

To find the central meridian at any time, find the 0^h U.T. central meridian for the appropriate date and system, and then add the hours and minutes corrections from the related table,"Motion of the Central Meridian," as shown in the example below:

SATURN, 1975

LONGITUDE OF CENTRAL MERIDIAN OF ILLUMINATED DISK

SYSTEM II -- 0^h U.T.

Day	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEP.	OCT.	NOV.	DEC.
1	245°5	219°6	275°5	245°0	120°9	087°8	323°1	290°9	260°2	139°2	112°0	354°1
2	337.6	311.6	007.4	336.8	212.7	179.7	054.9	022.8	352.1	231.2	204.0	086.2
3	069.7	043.6	099.4	068.7	304.6	271.5	146.8	114.7	084.1	323.2	296.1	178.3
4	161.8	135.7	191.3	160.6	036.4	003.3	238.6	206.6	176.0	055.2	028.1	270.4
5	253.9	227.7	283.3	252.5	128.2	095.2	330.5	298.5	268.0	147.2	120.2	002.5
6	345.9	319.7	015.2	344.4	220.1	187.0	062.3	030.4	359.9	239.2	212.2	094.6
7	078.0	051.7	107.1	076.2	311.9	278.9	154.2	122.3	091.9	331.2	304.3	186.7
8	170.1	143.7	199.1	168.1	043.8	010.7	246.0	214.2	183.8	063.2	036.3	278.8
9	262.2	235.8	291.0	260.0	135.6	102.5	337.9	306.1	275.8	155.3	128.4	010.8
10	354.3	327.8	023.0	351.9	227.4	194.4	069.8	038.0	007.7	247.3	220.5	102.9
11	086.4	059.8	114.9	083.7	319.3	286.2	161.6	129.9	099.7	339.3	312.5	195.0
12	178.4	151.8	206.8	175.6	051.1	018.0	253.5	221.8	191.6	071.3	044.6	287.1
13	270.5	243.8	298.8	267.5	143.0	109.9	345.3	313.7	283.6	163.3	136.7	019.2
14	002.6	335.8	030.7	359.3	234.8	201.7	077.2	045.6	015.6	255.3	228.7	111.3
15	094.7	067.8	122.6	091.2	326.6	293.6	169.0	137.5	107.5	347.3	320.8	203.4
16	186.7	159.8	214.5	183.1	058.5	025.4	260.9	229.4	199.5	079.4	052.9	295.5
17	278.8	251.8	306.4	274.9	150.3	117.2	352.8	321.3	291.5	171.4	145.0	027.6
18	010.9	343.7	038.4	006.8	242.1	209.1	084.6	053.2	023.4	263.4	237.0	119.7
19	102.9	075.7	130.3	098.6	334.0	300.9	176.5	145.1	115.4	355.4	329.1	211.8
20	195.0	167.7	222.2	190.5	065.8	032.8	268.4	237.1	207.4	087.5	061.2	303.9
21	287.1	259.7	314.1	282.4	157.7	124.6	000.3	329.0	299.4	179.5	153.3	036.0
22	019.1	351.7	046.0	014.2	249.5	216.4	092.1	060.9	031.3	271.5	245.3	128.1
23	111.2	083.7	137.9	106.1	341.3	308.3	184.0	152.8	123.3	003.6	337.4	220.2
24	203.2	175.6	229.8	197.9	073.2	040.1	275.9	244.7	215.3	095.6	069.5	312.3
25	295.3	267.6	321.7	289.8	165.0	132.0	007.7	336.7	307.3	187.6	161.6	044.4
26	027.3	359.6	053.6	021.6	256.8	223.8	099.6	068.6	039.3	279.7	253.7	136.5
27	119.4	091.5	145.5	113.5	348.7	315.7	191.5	160.5	131.3	011.7	345.8	228.6
28	211.4	183.5	237.4	205.3	080.5	047.5	283.4	252.5	223.2	103.8	077.8	320.7
29	303.5	-----	329.3	297.2	172.3	139.4	015.3	344.4	315.2	195.8	169.9	052.8
30	035.5	-----	061.2	029.0	264.2	231.2	107.2	076.3	047.2	287.9	262.0	144.9
31	127.5	-----	153.1	-----	356.0	-----	199.0	168.3	-----	019.9	-----	237.0

MOTION OF THE CENTRAL MERIDIAN

01^h -- 033°8	09^h -- 304°5	17^h -- 215°2	10^m -- 005°6	01^m -- 000°6
02 -- 067.7	10 -- 338.3	18 -- 249.0	20 -- 011.3	02 -- 001.1
03 -- 101.5	11 -- 012.7	19 -- 282.8	30 -- 016.9	03 -- 001.7
04 -- 135.3	12 -- 046.0	20 -- 316.7	40 -- 022.6	04 -- 002.3
05 -- 169.2	13 -- 079.8	21 -- 350.5	50 -- 028.2	05 -- 002.8
06 -- 203.0	14 -- 113.7	22 -- 024.3		06 -- 003.4
07 -- 236.8	15 -- 147.5	23 -- 058.2		07 -- 003.9
08 -- 270.7	16 -- 181.3	24 -- 092.0		08 -- 004.5
				09 -- 005.1

Figure 7

Example.--A festoon in the EZ transits the central meridian at 07^h 23^m on February 8, 1975 U.T. (EZ=System I).

System I C.M. at 0^h U.T., 8 FEB 1975	191°9
+ Motion of the System I C.M. in: 07^h	246.2
20^m	011.7
03^m	001.8
System I C.M. at 07^h 23^m, 8 FEB 1975 U.T.	451°6
	-360.0
	091°6 (092°)

Note that, if the calculated longitude exceeds 360°, one subtracts 360°. Also, in general, it is more realistic to round calculated longitudes to the nearest whole degree.

THE 1974 W.A.A. - A.L.P.O. CONVENTION AT U.C.L.A.

By: Phillip D. Wyman and James H. McMahon

The Twenty-Second Convention of the Association of Lunar and Planetary Observers was held in association with the Western Amateur Astronomers in Los Angeles at UCLA on August 9, 10, and 11, 1974.

The convention included a tour of certain facilities at the Jet Propulsion Laboratory in Pasadena. Full-scale models of spacecraft which have been associated with JPL were viewed, including Explorers, Rangers, Surveyors and Mariners. One principal site visited was the very large room where the spacecraft are assembled. This was most impressive. At the time of our visit two of the Viking craft which are scheduled to orbit Mars in 1976 were under construction. Another very large room visited was the spacecraft control room, where signals from Pioneer 10, Pioneer 11, and Mariner 10 were being received from monitoring facilities around the world.

On Friday evening, August 9, a star party was held at Charlton Flats in the San Gabriel Mountains, eight miles to the northeast of Mount Wilson. This star party was but a short distance from the Stony Ridge Observatory, which had also been opened for groups from the star party. The 30-inch Stony Ridge Newtonian-Cassegrainian gave convention goers breathtaking views of the Ring Nebula and the Hercules Cluster while those at the star party site were treated to views through amateur 'scopes, including the 24-inch belonging to the San Francisco Sidewalk Astronomers.

WAA President Tom Cragg and ALPO Director Walter Haas started off the first paper session with greetings and with the announcements that two of the organizations' most valuable members had recently died: Charlotte Carroll, longtime WAA Secretary, and Attorney David Barcroft, ALPO Secretary, a founding member of the Association and a noted selenographer in the United States and abroad.

The formal program then began with a stimulating paper by Ashley McDermott of the Department of Astronomy of the College of the Desert on the philosophy of science and on the philosophy of astronomy in particular.

Charles F. Capen of the Lowell Observatory, and ALPO Mars Recorder, pointed out that Mariner 9 television photography of Mars has added another valuable dimension to the 100 years of recorded telescopic acquired data. We can now evaluate the historic Martian seasonal record in terms of Martian topography. With regard to the dark areas on Mars, it is now thought that possibly a light ocher dust cover has been blown away, leaving behind the dark base rock. The Chryse feature is an alluvial plain near the mouth of the four-mile deep Coprates Rift Valley. The Prime Viking '76 landing site was chosen at Chryse because the most prominent sinuous channels with well-developed multiple tributaries are found in this region. The channel deposits have been interpreted by geologists as material deposited by a fluid -- presumably water. The Viking landing vehicles will search for Martian life in these low and hopefully "wet" areas. Mariner 9 television photography revealed the Tharsis-Amazonis region to be a young active land of giant shield volcanoes, volcanic domes, and volcanic craters. The entire region is above the normal elevation; and it is not densely impact-cratered, which indicates its recent formation. The larger volcanic features were discovered many years ago with telescopes and given names. This entire region has a telescopic history of unusual white cloud and bright spot activity. Photographs taken in blue light often show a W-cloud formation over this region. Measurements of these photos locate the white clouds over the elevated base shields and on the higher slopes of the volcanoes. Without the long-term observing record, we would know little about the meteorology and erosional history of Mars. We can now predict when and where certain white clouds will occur and forecast major dust storms.

Robert B. Rhoads, Assistant ALPO Mars Recorder, presented a paper summarizing the results of telescopic observations for the 1973 apparation of Mars. Over 70 observers have thus far contributed 1,016 individual telescopic observations to the ALPO Mars Section. The total visual observations recorded were 763, and photographs were 253. The quality of photographs was much improved over past apparitions. This was the last perihelic observing period for the planet until 1986. The 1973 Martian apparition was undoubtedly the most interesting and observationally exciting one in 17 years.

Mary Firth of the Polaris Astronomical Society presented a paper on solar photography for amateurs. She suggests that the primary requirement for successful solar photography is the right filter. Many filters are so dense that they offer a very comfortable visual image, but present a very dim image through the viewfinder system of the camera; and a precise focus is then more difficult to attain. Slow shutter speeds with dense filtering make it necessary to use motor drives and fixed mounting brackets. Mary presented much detailed information, and you are reminded that copies of the printed papers of the convention are available from any of the attendees.

Ronald A. Oriti of the Griffith Observatory considered the probability of inhabited planets within our galaxy. The paper stimulated much discussion. For many years nearly everyone has believed that there must be millions of inhabited planets within our galaxy . The fact that we had no proof of extra-terrestrial life, of any kind, did not matter. It was assumed, more or less as an act of faith, that life was ubiquitous throughout the galaxy. Recently, several attempts have been made to estimate, in some rational way, the number of inhabited planets by carefully considering as many of the pertinent factors as possible, and by assigning to these factors reasonable numerical values. The uncertainty in determining what these factors are, and the still greater uncertainty of deciding upon their numerical values, leads to conclusions which are uncertain by several orders of magnitude. In his paper Oriti examined some of the pertinent factors and their numerical values from the standpoint of three different views: the conservative, the liberal, and the middle-of-the-road. The conservative approach turned out to lead to a rather surprising conclusion, namely that the Earth is essentially a unique planet, and that higher forms of life are absent elsewhere in the galaxy. The philosophical implications of these conclusions are profound.

One of the outstanding features of this convention was the panel of experts. On Saturday afternoon attendees were asked to present written questions to a panel of experts consisting of T. R. Cave of the Cave Optical Co.; C. F. Capen of Lowell Observatory; and W. J. Kaufman, R. A. Oriti and E. C. Krupp, all of the Griffith Observatory. They responded to about 15 questions ranging in subject matter from eyepieces for low-power widefield viewing to astro-archeology, methods for checking the validity of the general theory of relativity, color filters for planetary work, grinding grits, meteorites, and mini black holes.

On Sunday morning, Lewis J. Chilton of the Los Angeles Astronomical Society recounted the history of the founding of the Los Angeles Astronomical Society. This event occurred in 1926. (Details are in the published Proceedings of the convention.)

Ed Johnston, also of LAAS, presented slides showing the construction of the new observatory of the Los Angeles Astronomical Society located in the mountains midway between Los Angeles and Bakersfield, in the vicinity of Lockwood Valley.

Dr. A. B. Gregory of the San Jose Amateur Astronomers discussed the problem of unemployment facing young astronomers and what can be done about it.

Charles L. Townsend of the Ventura County Astronomical Society discussed his studies of Venusian and lunar illuminance variations. For many astrographic, radiometric, simulation, and night vision applications, it would be convenient to have analytical expressions describing the sea level variation of Venusian and lunar illuminance on both horizontal and perpendicular surfaces. The author has empirically established and partially verified such expressions for the visible region of the electromagnetic spectrum.

Margaret C. Townsend of the Ventura County Astronomical Society presented details on photographic comet hunting. This method of search is best employed during the summer months, below Polaris and midway to the northern horizon, during the time interval from one hour before to one hour after local midnight. The Sun at this time is not far below the northern horizon, and the most likely place to find a comet is in the regions near the Sun. Comets brighten as they near the Sun and will be more easily detected closer to it. The search should be confined to the zone between +60° and +80° declination, avoiding the Northern Milky Way.

R. B. Minton of the Lunar and Planetary Laboratory of the University of Arizona reported in detail on photoelectric observations he had made upon Comet Bradfield (1974b) on 20 dates from March 25 through April 19, 1974. He used a 15-cm reflector at f/17 with a 1P21 photomultiplier and a Kodak W64 filter. This surface filter combination closely matches the spectral response of the dark adapted eye. He used a total of 87 comparison stars of many spectral classifications for a total of 106 measures. The only corrections applied to the data were for differential atmospheric extinction. Agreement between the data and visual observations reported on IAU Circulars is generally good. It appears that the larger scatter of the visual observations tends to mask rapid and small brightness variations. More comets should be observed in the future in a frequent and consistent manner.

Mike Otis of Aberdeen, South Dakota, reported on the south polar cap regression during the 1971 apparition of Mars. Sixty photographs by members of the ALPO Mars Section were selected for south polar cap measurement covering a period from 13 March to 27 September, which corresponded to late Martian winter and spring season in the southern hemisphere. The annual spring regression rate, or retreat, of the south polar cap was determined from an analysis of the photographs.

Jack Eastman of Denver summarized a paper prepared for the convention by Julius L. Benton, Jr., ALPO Venus Recorder. Dr. Benton's paper was an appeal for ultraviolet photographs of the planet Venus. The true surface features of Venus are seemingly permanently hidden from view by an opaque cloud layer. Any attempt to photograph the planet with ordinary emulsions (without employing a variety of specialized transmission filters) will yield little more than can be detected by the visual observer. Detail becomes quite prevalent, however, on photographs taken at a much shorter wavelength; in ultraviolet light moderately large, diffuse, and somewhat parallel banded features (running perpendicular to the line of the cusps) are nearly alway revealed. Such markings, which may be an indication of meteorological activity on Venus, may be quite transient in nature; or they may persist for a few days.

Charles Capen summarized a paper prepared for the convention by Virginia W. Capen of the ALPO Mars Section. The successful orbiting of Mariner 9 about Mars in 1971 and the subsequent acquisition of 7,232 high resolution television photographs of topographic features raised the state of our cartographic knowledge of Mars to equal that of our lunar mapping of the early 1960s. The Working Group on Martian Nomenclature of the International Astronomical Union devised a whole new scheme of topographic names to extend and to be compatible with the existing Schiaparellian system. The entire surface of Mars was divided into 30 geometric regions, each designated by the name of a prominent classical telescopic feature within its confines, which correspond to quadrangle charts used in the new USGS cartographic Atlas of Mars. A complete list of Mars feature names, their pronounciations, and their locations are presented in the author's new book, Martian Dictionary and Gazeteer of traditional Martian nomenclature. Today, the old and new names appear on the modern topographic charts and globes of

Figure 8. Panel of experts at WAA-ALPO Convention on UCLA campus in August, 1974. Left to right: Krupp, Kaufmann, Oriti, and Capen. Cave out of photo. See also text. Figures 8-15 are photographs taken and contributed by Phillip D. Wyman.

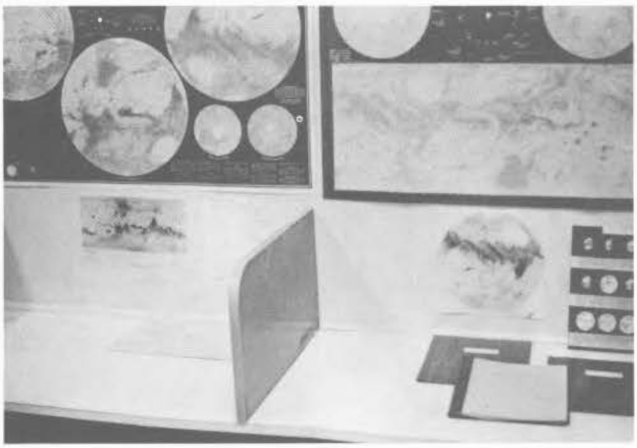


Figure 9. ALPO Mars Exhibit at 1974 WAA-ALPO Convention. Prepared by Mars Recorders C. F. Capen and Robert Rhoads.

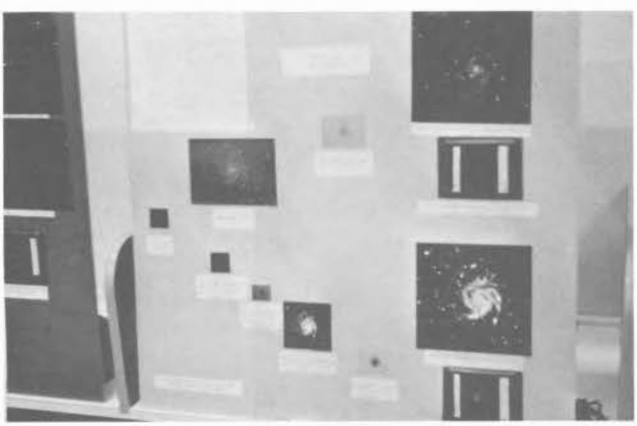


Figure 10. Exhibit prepared by Dr. Clarence P. Custer, Stockton, Calif. to illustrate enhancement of stellar images. An example of the technique was included.

Mars, which are helping the planetologists. The USGS Department of Astrogeology's Atlas of Mars is in preparation and consists of shaded relief maps at scales of 1:25,000,000 and 1:5,000,000. Overprints of albedo features and elevation contour lines at 1-kilometer intervals will be superimposed on the shaded relief maps. A 16-inch Visual-Relief Mariner 9 Mars Globe has been produced by the USGS and JPL at a scale of 1:17,000,000 and has been printed by Denoyer-Geppert Co., Chicago.

Figure 11. Mr. Ashley McDermott of the College of the Desert speaking to the convention.

Figure 12. C. F. Capen, ALPO Mars Recorder, giving paper during the Convention.

Figure 13. Mr. Robert B. Rhoads, ALPO Assistant Mars Recorder, giving paper during the Convention.

George O. Abell, Chairman of the Department of Astronomy at UCLA, presented a discussion on cosmology. He stated that the field equations of Einstein's 1916 general theory of relativity surprisingly allowed for the possibility of an expanding universe. By the early 1930s Hubble and Humason, using the Mount Wilson 100-inch telescope, had obtained data suggesting that the universe actually is expanding, and that the more distant a galaxy, the greater is its speed of recession. The question remains today: Will the universe continue to expand indefinitely (an open universe), or will it

Figure 14. Longtime A.L.P.O. members Thomas A. Cragg (left) and Thomas R. Cave. Mr. Cragg was General Chairman of the 1974 WAA - ALPO Convention. Both men have served as ALPO Section Recorders and have contributed to various observing projects.

Figure 15. Miss Grace A. Fox of Fort Dodge, Iowa, in the audience during one of the paper sessions. Walter H. Haas at left. Miss Fox may well have attended more ALPO Conventions than any other person. She has taught astronomy in evening classes at Fort Dodge to both young people of school age and to adults.

eventually begin to contract (a closed universe)? Dr. Abell discussed tests which would enable us to choose between alternate cosmological models. To carry out such tests, very accurate measurements are required on very remote objects. He feels that in a few years we may be able to say whether the universe is open or closed. (Although Dr. Abell's talk was not included in the printed Proceedings, it fairly well followed the chapter on cosmology in his text, "Exploration of the Universe".)

Walter H. Haas, ALPO Director, summarized a paper prepared for the convention by Phillip W. Budine, ALPO Jupiter Recorder. The paper consisted of a discussion of disturbances on Jupiter in the South Equatorial Belt (SEB) and the South Tropical Zone (STrZ). Since 1919 there have been thirteen eruptions in the South Equatorial Belt of Jupiter. An SEB Disturbance is more than just the appearance of any prominent marking in the SEB; it is a sequence of characteristic events and activity which has been repeated in an amazingly similar manner in each of the thirteen major Disturbances. In every case, an SEB Disturbance has occurred near the longitude (Jupiter System II) where a South Tropical Zone Streak or Disturbance has faded out or disappeared. The SEB outbreaks have occurred within a year of the disappearance of an STrZ Streak or Disturbance. The author includes some suggestions for future observations.

The Convention concluded on Sunday evening with the annual banquet and the awarding of the G. Bruce Blair Medal to San Francisco amateur John Dobson for his selfless efforts toward the popularization of astronomy through the San Francisco Sidewalk Astronomers. WAA President Thomas Cragg made the presentation, which was followed by informal remarks from Mr. Dobson.

At the ALPO Business Meeting, which was held on Saturday evening, the Association accepted an invitation to hold its 1975 convention in or near Berkeley with the Western Amateur Astronomers.

ANOTHER OLD LETTER FROM THE FIRST ALPO SECRETARY

By: David P. Barcroft, late Secretary of the A.L.P.O.

Foreword by Editor. There is hardly a better way to remember David P. Barcroft than to recall what he said and wrote. The following letter originally appeared in *The Strolling Astronomer*, Vol. 17, Nos. 9-10, p. 208, 1964. As explained there, it came to the Editor's attention accidentally, not having been composed for publication. It reveals much of our first Secretary's character and philosophy of life. Letters by enthusiastic teenagers requesting free information are common, sometimes requesting everything free about astronomy and sometimes expanded to ask for everything about space and the universe! What Mr. Barcroft had to say 10 years ago appears to us to be most applicable today. There should be one further note: Many ALPO Sections do now (but less so in 1964) furnish their own observing guides, general information circulars, news bulletins, and observing forms.

Dear Inquirer:

In reply to your recent inquiry: The A.L.P.O. as an organization has no literature save its publication, "The Strolling Astronomer," which is somewhat specialized and would likely be of little use to you at the present time.

Anybody undertaking the study of astronomy must get hold of all the books he can find on the subject. There are any number of these; many of them can be found in public libraries, and certainly your high school library ought to have a few of them.

You can't get any worthwhile information on astronomy simply by making requests that literature be sent to you. You have to do the legwork yourself by finding the literature.

And when you have found it, the next thing to do is to use it. There is no easy way of assimilating astronomy. It takes a lot of effort and this over many years.

But don't let this get you down. We all had to start the same way.

With kindest regards,
David P. Barcroft, Secretary
Association of Lunar and Planetary Observers

THE 1972-73 APPARITION OF SATURN

By: Julius L. Benton, Jr., ALPO Saturn Recorder

Introduction

The Report which is presented here is based upon observational data received by the Saturn Section for the period from 1972, October 3, through 1973, May 22. The numerical value of B, the planetocentric latitude of the Earth as referred to the plane of the ring system, varied between $-26^{\circ}\!.4$ and $-26^{\circ}\!.9$. The southern hemisphere of the planet Saturn was thus seen to advantage throughout this apparition, the ring system being open to its fullest possible extent during the month of May. Opposition occurred on 1972, December 9, at which time the apparent visual magnitude of Saturn was -0.3; and the equatorial and polar diameters of the planet were respectively $20''\!.71$ and $18''\!.53$. The major axis of the ring system was $46''\!.65$, and the minor axis was $20''\!.73$ on opposition date.

WAA/ALPO CONVENTION
LOS ANGELES
1974

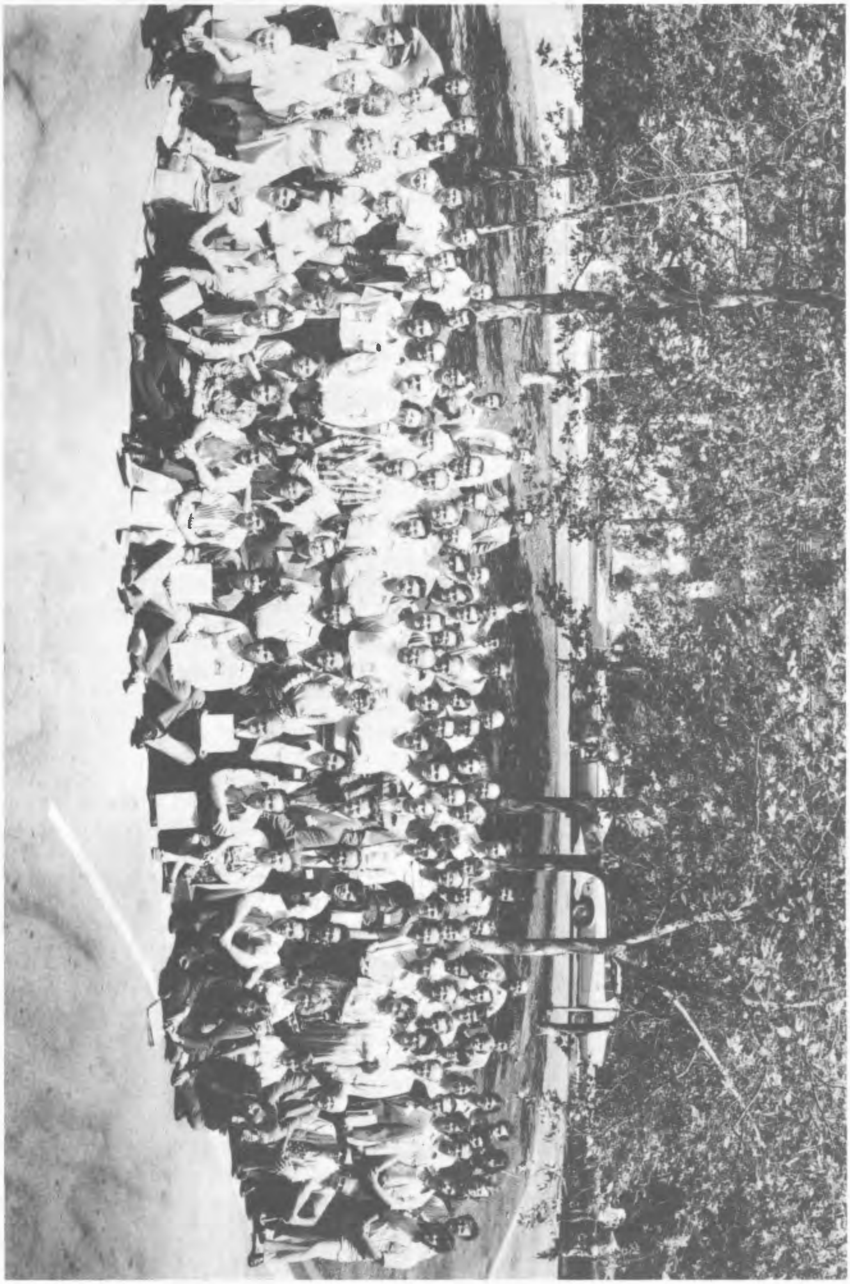


Figure 16. Group photograph of WAA-ALPO Convention in 1974.

The following thirteen individuals contributed observational data to the Saturn Section during the 1972-73 apparition:

Observer	Location of Observing Station	No. Dates of Observation	Instrumentation
Benton, Julius L.	Savannah, Georgia	7	4" (10cm.) Refr.
Davis, Darryl	Fresno, California	1	8" (20cm.) Refl.
Doel, Ron	Willingboro, New Jersey	6	8" (20cm.) Refl.

Observer	Location of Observing Station	No. Dates of Observation	Instrumentation
Haas, Walter H.	Las Cruces, New Mexico	16	6" (15cm.) Refl. 12 1/2" (31cm.) Refl.
Heath, Alan W.	Nottingham, England	16	12" (30cm.) Refl.
Hull, Richard	Richmond, Virginia	1	7" (18cm.) Refr.
Keel, Billy	Nashville, Tennessee	1	6" (15cm.) Refl.
Mattei, Michael	Harvard, Massachusetts	1	6" (15cm.) Refr.
Pastore, Peter	Massapequa, New York	20	6" (15cm.) Refl. 10" (25cm.) Refl.
Porter, Alain	Narragansett, Rhode Island	26	6" (15cm.) Refl.
Sherrod, Clay	Little Rock, Arkansas	1	10" (25cm.) Refl.
Soder, Jim	Sidney, Ohio	1	10" (25cm.) Refl.
Westfall, John E.	San Francisco, California	5	10" (25cm.) Refl.

A total of 102 reports was received from the thirteen individuals mentioned above, and the following distribution of submitted observations by months will serve to illustrate those periods of most thorough coverage:

1972,	October	3	1973,	February	19
	November	14		March	16
	December	7		April	9
1973,	January	30		May	4
				Total	102

The greatest mass of observational data was obtained during the months of November, January, February, and March, as can be seen by reference to the numerical analysis presented above. The planet Saturn emerged from the glare of the Sun (conjunction) during late June, 1972; but no observations were obtained until October. As in previous apparitions, this demonstrates that a severe neglect of the earliest parts of the observing season persists; and the writer would like to urge our participating observers to begin their studies of Saturn just a bit sooner in subsequent apparitions. By reference to *The American Ephemeris and Nautical Almanac* and *An Amateur's Guide to Visual Observations of the Planet Saturn*, individuals can plan their observing programs well in advance of any given observing season. The planet Saturn once again moved into the domain of the Sun during June, 1973, conjunction occurring on the 15th of that month.

At this point, the writer would like to express his sincere gratitude to those persons who actively participated in the observing programs of the Saturn Section throughout the 1972-73 apparition. Continued support from individuals such as these is very much needed, and it would be excellent if quite a few more persons could begin systematic observing programs on Saturn for the next apparition. The more good observers we can attract, the greater will be the significance of the accumulated data for any given observing season.

The Globe of Saturn

Southern Portions of the Globe. The southern hemisphere of the planet Saturn *did not* show any *significant* increase in activity throughout the 1972-73 apparition as compared with the preceding (1971-72) observing season. Even so, most of the Saturnian zones had darkened considerably since 1971-72, with the exception of the SEB Z and the SPR; and the belts reported on the globe of the planet were generally lighter than they had been in the preceding apparition, exclusive of the SPR, the EB, and the SEB_n. The table of average numerical intensity estimates presented here is in keeping with the preliminary comparative study begun with the 1971-72 report (see *The Journal of the A.L.P.O.*, Vol. 24, Nos. 7-8, pp. 139 and 140).

ZONES:	1971-72	1972-73
EZ	7.1	6.5
STeZ	6.3	5.5
STrZ	6.6	5.7
SEB Z	4.5	5.3
SPR	4.2	4.1
BELTS:		
SPC	6.3	4.9
EB	4.0	3.8
STeB	3.9	4.3
SEB_s	3.5	3.8
SEB_n	3.4	3.4
SPB	3.2	3.7

Constant: Outer third of Ring B taken at 8.0 on the A.L.P.O. Numerical Intensity Scale from 0.0 (black - shadows) to 10.0 (brightest).

South Polar Region (SPR). The majority of contributing observers were in agreement that the SPR remained fairly stable in intensity throughout the 1972-73 observing season; and upon comparing the current period with previous apparitions, we find that the SPR has not experienced any marked fluctuations in brightness since 1967. During the months of November, January, and February, the writer reported that the SPR was diffuse, greyish to yellowish-grey in coloration, and considerably darker than the surrounding areas. Confirming the preceding impression, Haas described the SPR as being rather ill-defined on most occasions and quite diffuse throughout the apparition. The same individual detected the very commonly elusive SPB (South Polar Belt) during the months of November, December, April, and May, indicating that this belt appeared as an abnormally broad, faint, greyish feature. Using a red (W25) filter, Haas suspected a narrow bright zone on May 12 just north of the somewhat dark and wide SPB. In addition, he observed that the SPC (South Polar Cap) was always light and perceptibly brighter than the associated environs of the SPR. Heath consistently stated that the SPC was greyish; and he noted that it was always darker than the SPR, in direct contrast with the impressions of a number of other observers. Pastore indicated that the SPR was fairly dark, usually the darkest area on the planet's surface; he noted that the SPR was quite prominent throughout the 1972-73 period. Porter observed that the SPR was usually bright, although it was suspected to have a darker area in the extreme south (the SPC?). The same individual described the color of the SPR as brownish-grey to tan, and he noted that the SPR possibly brightened a little during January. Porter indicated that the SPC was most conspicuous during March, and he suspected the very faint SPB during mid-February.

South South Temperate Zone (SSTeZ). Observers were in general agreement that the SSTeZ was only very slightly darker than the STeZ. Porter noted that this zone was quite inconspicuous and faint throughout the months of January through March, having a whitish-grey coloration. On February 5 Porter detected a small festoon in the SSTeZ; however, corroborating evidence was lacking from other observers.

South South Temperate Belt (SSTeB). Porter reported that the SSTeB was difficult to distinguish from the general shading of the SPR on most occasions, and he assigned a greyish-brown to greyish color to this belt. The SSTeB was slightly darker than the STeB, according to Porter. No other individuals detected this infrequently observed feature.

South Temperate Zone (STeZ). In general, contributing observers described the STeZ as being much darker than it had been in previous apparitions, and reports confirmed that the STeZ was darker than the STrZ by only a slight amount. The STeZ was only very slightly brighter than the SSTeZ and the SEB Z on the average. Porter indicated that the STeZ maintained a fairly consistent intensity throughout the 1972-73 apparition, and he noted as well that the STeZ was frequently less than or equal to the STrZ in brightness. On several occasions it was equal to or greater than the brightness of the SSTeZ. Porter also noted the color of the STeZ as yellowish-white to greyish-white, and he suspected a small projection or disturbance on February 19 in this zone. Heath stated that the STeZ was grey and only a fraction lighter than the polar regions (SPR) early in the apparition; but later in the observing season the SPR and the STeZ were nearly equal in intensity, making it exceedingly difficult to distinguish the STeZ separately.

South Temperate Belt (STeB). For the most part, individuals agreed that the STeB was the lightest belt on the planet's disc, although only a small amount brighter than the SSTeB. The SPB was considerably darker than the STeB, and it was apparent that the STeB had lightened somewhat since the preceding apparition (1971-72). Porter remarked that, when it was clearly seen, the STeB had a fairly consistent intensity; and it was brighter than the SPB on most occasions. The same observer noticed as well that the STeB was equal to or greater than the SSTeB in brightness, and he assigned a greyish to greyish-white hue to the belt. Haas suspected the STeB on only a few dates during the apparition, while no other individuals reported having seen it at all.

South Tropical Zone (STrZ). The STrZ exceeded in overall brightness the STeZ, the SSTeZ, and the SEB Z; however, the intensity difference among these features was not significant. Most individuals tended to agree as well that the STrZ had darkened to a small degree since the previous apparition. Porter observed that the brightness of the STrZ was stable throughout the 1972-73 period, although it was roughly equal to or slightly brighter than the STeZ or SSTeZ. According to the same individual, the color of the STrZ was greyish-white to yellowish-white. No other individuals indicated having detected this zone during the 1972-73 apparition.

South Equatorial Belt (SEB). From a general point of view, the SEB was clearly the darkest and most conspicuous belt on the surface of the planet, even though the SEB was on occasion nearly equal in intensity to the SPB and only slightly darker than the EB (Equatorial Belt). In addition, the SEB was usually consistent in intensity with past apparitions as far back as 1967. When the SEB was clearly differentiated into components, the SEB_n was darker than the SEB_s, and the SEB Z was brighter than it had been in previous observing seasons. According to the writer, the SEB was frequently separated into the SEB_n and SEB_s components, and the SEB_n was always the darker of the two by a small amount. When the SEB was not divided, the northern edge of the belt remained always the darkest portion of the SEB, and the writer noted that the SEB as a whole was much darker late in the month of January than in earlier days of the same month. The coloration of the SEB_n and SEB_s was noted by the same individual to be yellowish-grey to greyish, while the color of the SEB Z was white to greyish-white. Haas indicated that the SEB was reddish-brown to brownish-grey in color, and the dual nature of the belt was not always obvious. When he did see the SEB components, however, the SEB_n was usually the darker of the two; and the intensities of the SEB_n and SEB_s were quite stable during the apparition. Haas described the SEB Z as being less bright than the cumulative brightness of the globe between the SEB and the SPR; it was only a little brighter than the SPR. Porter stated that the SEB_n was barely darker than the SEB_s, while the visibility of the SEB Z was often open to question. He noted as well that, as the apparition progressed, the SEB Z appeared to brighten to a small degree, accompanied by a slight darkening of the SEB_n and SEB_s components. Porter assigned a greyish-tan to greyish color for the SEB_n and SEB_s, while the SEB Z appeared yellowish to yellowish-white. Heath reported a possible intensity variation with respect to the SEB, and later in the apparition the N edge of the SEB was darker than the rest of the belt. There was to him no obvious differentiation of the SEB into components, and he described the color of the SEB as greyish to brownish.

Equatorial Zone (EZ). All participating observers were in agreement that the EZ was indeed the brightest zone on the visible surface of the planet, even though it had been much brighter in the 1971-72 period than during the 1972-73 apparition. Perceived only rarely, the EB was described by individuals as being somewhat darker than the STeB and the SSTeB, but it was of about the same intensity as the SEB_s and a little lighter than the SEB_n. The writer described the color of the EZ as being yellow-white, and it was obvious that the EZ was the brightest of the zones of Saturn; this zone became a little brighter in January, and by February the EZ was nearly as bright as the inner portion of Ring B. Heath also remarked that the EZ was by far the brightest zone on the planet's disc, often approaching the overall intensity of the inner part of Ring B but never quite being equal to it. Confirming the preceding impression, Heath noted that the EZ became brighter during the apparition. He saw the EB under good seeing conditions as a faint, narrow, and fairly continuous line. Also describing the EZ as the brightest zone, Haas indicated that the EZ was not so bright as Ring B, although it did on occasion approach the intensity of Ring A. He reported a yellowish-orange to yellowish-white hue for the EZ, and Haas stated that the elusive EB was

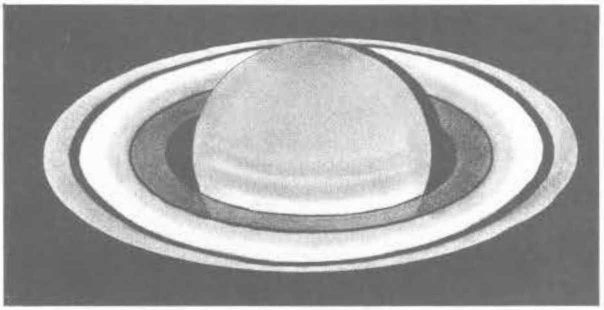


Figure 17. Drawing of Saturn by Julius L. Benton, Jr., on February 16, 1973, $1^h 0^m$-$1^h 15^m$, U.T., 10.2-cm. Unitron refractor, 214X. Seeing good (7 on a scale of 0 to 10 with 10 best), transparency 4 (limiting stellar magnitude). Slight wind, Moon near full. No filter. Cassinin's Division seen well completely around the ring system. Ball uniformly shaded from SEB_s to SPR. SEB divided into two components, SEB Z fairly obvious. Suspected South Polar Cap. Suspected B2 "division".

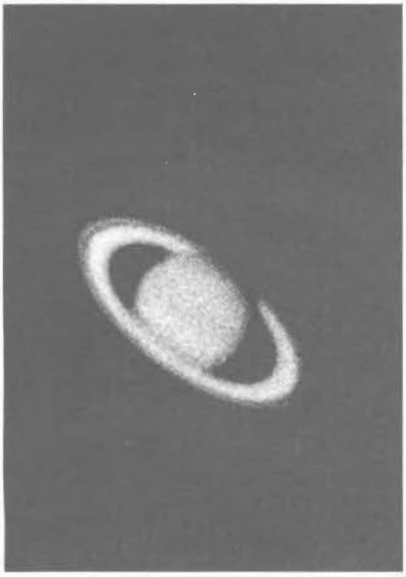


Figure 18. Photograph of Saturn on January 14, 1973 with a 7-inch refractor at f:75. Exposure 2 seconds. Developed for 14 minutes in Rodinol 50:1. ASA 400. Tri-X film. Figures 17, 18, and 19 are all simply inverted views with south at the top.
The photograph in Figure 18 was taken by R. Hull.

usually quite difficult to perceive. Porter reports that the EZ was brighter at the beginning of the apparition than it was much later, a view which did not agree with the results obtained by other individuals. He was able to detect a faint disturbance in the EZ on February 18, which appeared to enclose a brighter region of the zone near the E. limb; additional activity was suspected on the following evening. Porter compared the brightness of the EZ to the intensity of Ring A, and he noted that it was not nearly so bright as Ring B. The same observer described the color of the zone as being white to greyish-white, and he remarked that the EB was fairly easy to see on most occasions; Porter noted the color of the EB to be greyish to brownish-grey.

Shadow of the Globe on the Rings. Most individuals described the shadow of the ball of Saturn on the ring system as being a distinct black throughout the 1972-73 apparition. A possible deviation from the true black of such a shadow is undoubtedly a result ot imperfect seeing conditions and limited telescopic resolution.

Latitudes of Saturn's Belts and Zones. As was the case in other recent years, Haas was the sole observer to submit usable visual latitude estimates of features on the globe of Saturn during 1972-73. Using the technique he developed some years ago, Haas estimated visually the fraction of the polar semidiameter of the planet's disc subtended on the CM by the belt whose latitude is desired. The method is obviously quite simple and the resulting data are often very reliable, and the method has been the accepted one for use by Saturn observers for three or four years. Mathematical reduction to latitudes appears below, but it must be recognized that it would be quite presumptuous to attempt to derive too much from data accumulated by only one individual,

VISUAL NUMERICAL INTENSITY ESTIMATES OF SATURNIAN FEATURES FOR THE 1972-73 APPARITION

Feature	Number of Estimates	Derived Average Intensity
Zones:		
EZ	56	6.5
STrZ	30	5.7
STeZ	31	5.5
SSTeZ	14	5.4
SEB Z	41	5.3
Globe between SEB & SPR	19	5.1
SPR	47	4.1
Belts:		
SPC	14	4.9
STeB	28	4.3
SSTeB	16	4.1
EB	14	3.8
SEB_s	44	3.8
SEB	17	3.7
SPB	6	3.7
SEB_n	49	3.4
Rings:		
Ring B (outer third)	--	8.0 STD
Terby White Spot	8	7.6
Ring B (inner portion)	52	7.1
Ring A (just outside B10)	4	7.0
Ring A (outside A5)	55	6.1
Ring A (inside A5)	55	5.9
Ring A (general)	18	5.9
B1 (near ansae)	14	3.3
A5 (near ansae)	29	2.6
Crape Band	51	2.0
B3 (near ansae)	12	1.4
B8 (near ansae)	6	1.2
Ring C off globe	25	1.2
B10 or A0	22	0.4
Shadow Globe on Rings	13	0.2

Visual numerical intensity estimates are based upon the accepted ALPO scale of 0 to 10, with 0.0 representing complete black (shadows) and 10.0 indicating the brightest objects. The adopted standard for the planet Saturn is the outer third of Ring B, which has been assigned a value of 8.0. A detailed discussion on visual photometry can be found in the new _A Guide to Visual Observations of the Planet Saturn_, available from the Recorder.

---

regardless of how precise his work may have been. One might hope that this table would stimulate others to start taking an active part in this aspect of Saturn studies, and complete instructions for initiating such a program of quantitative importance may be found in the new observing guide mentioned earlier in this paper.

Latitudes of Saturnian Features during the 1972-73 Apparition

Saturnian feature	Planetocentric	Planetographic	Eccentric (Mean)
N edge Crape Band*	+28°.9	+34°.8	+31°.8
S edge Crape Band*	+20 .4	+25 .0	+22 .6
N edge SEB_n	-20 .1	-24 .7	-22 .3
S edge SEB_n	-23 .9	-29 .0	-26 .4
S edge SEB_s	-28 .2	-33 .9	-30 .9
N edge SPR	-78 .7	-80 .9	-79 .9
N edge SPB	-75 .8	-78 .6	-77 .2
S edge SPB	-86 .5	-87 .2	-86 .9

Figure 19. Photograph of Saturn on November 5, 1972, by Clay Sherrod at 9^h 12m, U.T. Cave 10-inch reflector at f:96. Seeing 4.5 on a scale of 5, very steady. Exposure 4 seconds. Plus-X flim. P.C. paper, #3 filter.

Latitudes of Saturnian Features during the 1972-73 Apparition

Saturnian feature	Planetocentric	Planetographic	Eccentric (Mean)
Ctr. EB	-03°.4	-04°.3	-03°.8
Ctr. STeB	-59 .2	-64 .6	-62 .0

*The latitude of each edge varies as the tilt of the rings to the Sun and the Earth changes.

The latitude values in the above table were derived at best from only six or eight visual numerical estimates, and there remain a number of possible random and systematic errors which cannot be analyzed properly until more data are available from a greater number of individuals. For the more interested observer, a detailed discussion of the three types of latitude and their derivation may be found in The Journal of the A.L.P.O., Vol. 24, Nos. 1-2, pg. 32.

(to be concluded in next issue)

BOOK REVIEWS

Atomic Physics and Astrophysics, Volume 2, Edited by M. Chretien and E. Lipworth. Gordon and Breach Science Publishers, New York, 1973. 337 pages. Price $22.00.

Reviewed by Julius L. Benton, Jr., ALPO staff

The Brandeis Summer Institutes in Theoretical Physics are designed to play a significant role in the advanced training of physicists, chiefly by striking a happy medium between graduate courses in the science and the more specialized research papers presented at formal meetings and conferences.

Lectures given within the present book are intended primarily for advanced graduate students and for postdoctoral students; and the 12th Institute, which was held from 1969, June 16 to July 25, was organized around the topic of Atomic Physics and Astrophysics. The specialist will recognize a significant interplay between these fields in recent years. The book is composed of lectures contributed by three individuals:

(1) Dr. W. R. Bennett, of the Dunham Laboratory, Yale University, discusses some aspects of the physics of gas lasers. Emphasis is placed on various properties of optical cavity modes and on the interaction of radiation with excited atoms.

(2) Dr. R. Novick, of Columbia University, presents a review of the experimental techniques employed in x-ray astronomy, giving emphasis to the quite recent development of x-ray telescopes and polarimeters. Dr. Novick describes additionally the observations and theoretical models of Sco X-1, the Crab Nebula, and the diffuse x-ray background.

(3) Dr.A. Dalgarno, of the Harvard College Observatory and the Smithsonian Astrophysical Observatory, Cambridge, Mass., considers the one- and two-photon decay models of the meta stable states of atoms which are of astrophysical importance. Following this discussion, he deals with the quantum mechanics of simple radiative and collision processes.

Admittedly, the present book has little if any place in the library of the non-specialist. Professional colleagues and intermediate or advanced graduate students of physics will find, as with previous volumes, that this book is worthy of their attention.

* *

Interstellar Communication: Scientific Perspectives, by Cyril Ponnamperuma and A. G. W. Cameron. Houghton Mifflin Co., 110 Tremont St., Boston, Mass. 02107, 1974. 226 pages, paperbound, $5.95.

Reviewd by James M. Marron, Grand Rapids, Mich.

This book is claimed to be a readable version of the NASA Ames Research Center lectures of 1970 and suitable for the "general reader." However, it would require considerably more text than is offered to prepare the "general reader" for each of the disciplines of science involved in this work. It is not for the beginner!

This is not intended to mean the book is without merit. No one could ask for a more impressive roster of contributors than we find here. These are Sagan, Cameron, Ponnamperuma, Arbib, McCarthy, Aronoff, Bracewell, Drake, Oliver, and Morrison. Together, they cover every aspect of the problem from astronomy to zoology. With this formidable array of talent, Interstellar Communication must be considered the present state-of-the-art reference.

We shall examine a sampling of the many contributions by these notable authorities:

Carl Sagan introduces the reader to the problems of interstellar communicaion. Stellar and planetary evolution are examined in the traditional manner of current textbooks by A. W. G. Cameron. The chemistry of life, which section was updated prior to publication, is discussed by Cyril Ponnamperuma.

Communication by means of space probes is advocated by R. N. Bracewell, but he is alone as far as the other writers in the book are concerned. They unanimously prefer radio signals. However, Bracewell's plan of repeating back anything suspected of being a signal impresses this reviewer as a better method of establishing contact than any of the other proposals.

Morrison's suggestion to use the hydrogen frequency for signals is properly refuted on the grounds of extensive natural interference. A new plan calls for the use of a clean window between 1420 MHz and 1662 MHz. Morrison suggests that we push forward with an attempt to trap whatever "party line" system may exist out there.

The 39-page bibliography was prepared by staff members of the Ames Research Center and Hughes Laboratories, and it is so extensive and well arranged as to deserve special praise.

In summary, one would have to say that the book is worth the effort needed to read it with understanding; but, as might be expected, the presentations are often at cross purposes. This reviewer's impression is that money, time, and technology (in that order) needed for interstellar communication will force us to hold off. Unless, of course, "they" come to us.

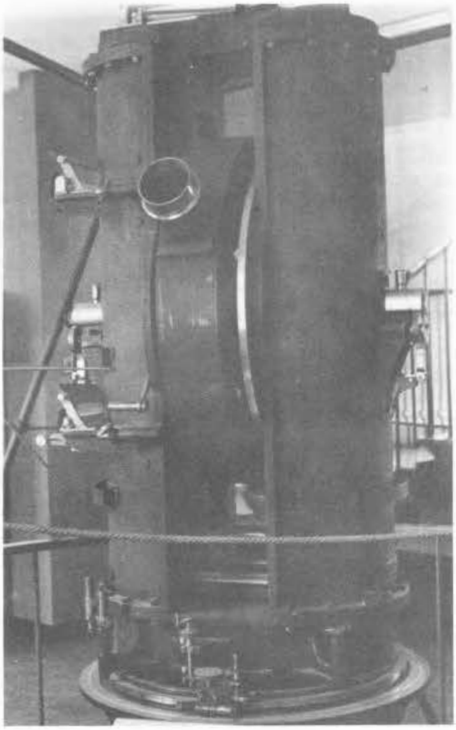


Figure 20. Airy Transit Circle at the old Royal Greenwich Observatory. Photograph by Alan W. Heath, June 21, 1974.

Figure 21. Sextant used by Captain Cook in Tahiti, now at the old Royal Greenwich Observatory. Photograph by Alan W. Heath, June 21, 1974.

TWO FAMOUS ASTRONOMICAL INSTRUMENTS

David P. Barcroft had a great admiration and an informed regard for our scientific forebears of the past. In the English-speaking world this respect readily included English astronomers of past centuries. Our late colleague's private library in Madera included many volumes of the old *English Mechanic*, a journal famous among devotees of astronomy for many years and now hard to find at all.

It is thus especially appropriate to present in this memorial issue Figures 20 and 21, briefly explained by their captions. These were contributed by Mr. Paul K. Mackal of our staff, to whom we express our thanks. Mr. Mackal received these photographs from Mr. Alan W. Heath, who took them on a vacation trip to the old Greenwich Observatory on the banks of the Thames. We trust that our readers will enjoy these pictures.

THE OCCULTATION OF VENUS BY THE MOON ON 1974, JULY 17

By: Lawrence B. Nadeau

Although using only the naked eye, the writer observed the occultation of Venus without difficulty from Washington, D.C. It was a gorgeous sight to watch Venus and the Moon rise through morning mists in an essentially dark sky. The two bodies could be cleanly separated by black sky until about three minutes before predicted disappearance. Thereafter Venus could be easily recognized, by its higher brightness per unit area and much whiter color, as a quite brilliant protrusion against the yellowish crescent. Diffraction in the eye produced flare spikes, also contrasting nicely in terms of brightness and color, which extended across the crescent to the earthlit portion of the

Moon. The process of disappearance was clearly evident, and the brightness decline was uniform over a period of about fifteen seconds. Scheduled disappearance was at 8:52 U.T., with both objects 11° above the horizon and the Sun 10° below it.

By the time of reappearance, scheduled for 9:42 U.T., with both objects 20° above the horizon and the Sun only 2° below it, earthshine could no longer be confidently detected. The easily visible reappearance of Venus seemed extremely rapid, the diffraction disk of the planet forming essentially instantly, as with a stellar occultation. There was very little additional increase in brightness, if any, in the ensuing seconds. Sky brightness was high enough that no diffraction spikes were visible. At both reappearance and disappearance the interval between contacts had been predicted to take about twenty seconds.

ANNOUNCEMENTS

Sustaining Members of the A.L.P.O. Our Sponsors were listed on page 40 of Vol. 25, Nos. 1-2 of this Journal. There follows a list of our Sustaining Members as of November 17, 1974. These persons have paid $10 per year to assist substantially in the financial support of the A.L.P.O. They are: Sky Publishing Corporation, Charles F. Capen, Charles L. Ricker, Elmer J. Reese, Carl A. Anderson, Gordon D. Hall, Michael McCants, Ralph Scott, A. W. Mount, Charles B. Owens, Joseph P. Vitous, John E. Wilder, A. K. Parizek, B. Traucki, Lyle T. Johnson, H. W. Kelsey, Philip Wyman, Daniel H. Harris, the Junior Texas Astronomical Society, W. King Monroe, James W. Young, Klaus R. Brasch, Inez N. Beck, Dr. George W. Rippen, Dr. Joel W. Goodman, Harry D. Jamieson, Commander W. R. Pettyjohn, Robert M. Adams, Orville H. Brettman, Brad Dischner, Dr. Juan Homero Hernández-Illescas, Dr. Julius L. Benton, Jr., Hoy J. Walls, Robert M. Peterson, Christopher Vaucher, Winifred S. Cameron, Charles S. Morris, Richard J. Wessling, and Sheila B. Cassidy.

Present Director of Jupiter-Saturn Section of Oriental Astronomical Association. This person is Mr. Isamu Hirabayashi, 26-2,3-chome, Sanno, Ota-ku, Tokyo, Japan. He has succeeded Mr. Takeshi Sato. Japanese amateur observers have carried out some excellent work on the planets Jupiter and Saturn.

Substitute Offer for 1971 Astronomical League National Convention Proceedings. Mrs. Wilma Cherup, Executive Secretary of the League, 4 Klopfer St., Pittsburg, Pa. 15209 writes that it has been regretfully decided not to publish Proceedings of the 1971 National Convention at Memphis, in which the ALPO participated. Persons who paid in advance for these Proceedings have the choice of: (1) A copy of the 1973 Proceedings (Omaha), (2) A copy of the 1967 Proceedings (Washington, D.C.), or (3) A refund of $1.

Extinction Correction for Visual Magnitude Estimates of Comets. When a comet low in the sky is compared to stars at somewhat different angular elevations than its own, there is a systematic error because the atmospheric extinction is not the same for the comet and the comparison stars. Mr. R. B. Minton, Lunar and Planetary Laboratory, University of Arizona, Tuscon, Arizona 85721 has a computer program which will evaluate the magnitude of this effect. The program will use any known extinction coefficient; or if none has been determined, it will choose an average value. Serious amateurs are invited to use this service to improve their visual observations of comets. Mr. Minton is offering his help free of charge.

Lunar Sections Staff Changes. Mr. Harry D. Jamieson is offering his resignation as a Lunar Recorder, and it is being accepted with considerable regret. Mr. Jamieson's services to the Lunar Section and to the ALPO in general have been considerable. Future plans for the Lunar Dome Survey, which he has capably headed, are uncertain at the present time. It is a pleasure to express our deep thanks for all that Harry Jamieson has done for the ALPO and for a large number of amateur astonomers and to wish him every future success.

Dial-A-Phenomenon. Current weekly announcements about astronomical phenomena, including the visibility of planets and artificial satellites, may be obtained by dialing telephone number A.C. 202-737-8855. The number is not toll-free. Events are described as seen in the Washington, D.C. area.

IN MEMORIAM: DAVID P. BARCROFT

By: Walter H. Haas
(Based in part on material kindly supplied
by Mrs. Genevieve Conn and Mr. Jackson Carle.)

The occasion was one of the joint meetings of the Western Amateur Astronomers and the ALPO something like 15 years ago. With the greatest reluctance and after much urging by this writer, attorney David P. Barcroft of Madera, California, had given a paper about some facet of lunar studies. He gave it with his usual brusqueness; but when he concluded, he talked for some minutes on the singular and close relation between himself and me. The relation would be dissolved, he predicted, only by the death of one of us; and as an older man, he suspected that he knew which one. The fulfilling of this forecast is a sad loss to all true friends of amateur astronomy and an irreparable loss to those who personally knew him.

He was born about 77 years ago and became interested in astronomy near the age of 10. He bought his first book on astronomy in Fresno, Calif., when he was 12. Material about astronomy was hard to find in those days--how hard those now under 45 or so have little idea. He often travelled the length of California to compare notes with other amateur astronomers. In later years he bought great numbers of books from second-hand agencies and others. The books were not merely collected; they were studied and restudied. Page markers with particular subjects indicated would stick like a forest of trees from the top edges of the books on his shelves and in adjacent stacks. He had almost 300 volumes at the time of his death, many of them long out of print.

Figure 22. David P. Barcroft with the G. Bruce Blair Medal awarded him by the Western Amateur Astronomers in 1960. The award is given annually for outstanding work in amateur astronomy. Figures 22 and 23 are taken from newspaper clippings supplied by his sister, Mrs. Genevieve M. Conn.

Figure 23. David P. Barcroft studying the Apollo 8 Moon flight on his maps and photographs of lunar regions. Taken in his study in his home at Madera, California.

His telescope at his home in Madera, California was a 10-inch reflector. It is the Dr. Johnson instrument pictured in Vol. 1 of Amateur Telescope Making.

His good judgement and firm direction were primarily responsible for preserving the Western Amateur Astronomers from a very early dissolution when severe conflicts about goals and particular organization format threatened to destroy it. For many years up to the time of his death he was in charge of the WAA committee which prepared physically the annual G. Bruce Blair Award--a metal plaque. Yet he was seldom to be found in the audience during a WAA paper session. He and a few long-time friends would be holding a "rump session" outside the convention hall. Only a rare speaker like John Mellish or Dr. Alter would attract him inside.

He practiced law in Madera for many years, at first in the same law firm as his father, Joseph Barcroft. His chief fame, he was fond of saying, came when he defended former heavyweight champion Jack Dempsey against a charge of speeding. Legal work often took a back seat to his enthusiasm for astronomy.

My first contact with Dave came in 1940 when he published an article, "The Bands of Aristarchus," in the old Popular Astronomy. Our correspondence became voluminous in the next several years. Typically, when I corrected some of my interpretations of personal observations of the lunar crater Aristarchus, I learned that Dave had known the true state of affairs all along. Surely it can now be revealed that he funded and made possible the publication of my lengthy article on apparent lunar surface changes, "Does Anything Ever Happen on the Moon?", in The Journal of the Royal Astronomical Society of Canada in 1942 *et seq*. It was inevitable that he should be the Secretary of the A.L.P.O. when that society was founded in 1947, a post which he filled with great devotion until his death. The English selenographer, H. Percy Wilkins, renamed the crater Dollond B Barcroft in his honor. Dave would describe it as "just a pile of rocks" which he couldn't identify with his telescope. Writer and astronomer Patrick Moore dedicated his book, The Story of Man and the Stars, to Dave.

The Strolling Astronomer

SUBSCRIPTION RATES

Single Issue (in stock)	$ 1.50
1 Year	6.00
2 Years	10.00

SPECIAL MEMBERSHIPS

Sustaining Members	$10 per year
Sponsors	$25 per year

☆ ☆ ☆

ADVERTISING RATES

Full Page Display Ad	$40.00
Half Page Display Ad	22.50
Quarter Page Display Ad	15.00
Classsified or Listing (per col. in.)	4.00

Discount of 10% on 3-time insertion.

☆ ☆ ☆

NOTICE: In order to facilitate the reproduction of drawings in future issues readers are requested to exagerate contrasts on drawings submitted. Extremely faint marks cannot be reproduced. Outlines of planetary discs should be made dark and distinct. It is not feasible to reproduce drawings made in colors. Following these precepts will permit better reproductions.

Persons requiring prompt acknowledgement of correspondence or contributed observations from staff members are requested to furnish stamped, self-addressed envelopes.

STAFF

EDITOR

Walter H. Haas
Box 3AZ
University Park, New Mexico 88003

SECRETARY

J. Russell Smith
8930 Raven Drive
Waco, Texas 76710

LIBARIAN

Mrs. Walter H. Haas
2225 Thomas Drive
Las Cruces, New Mexico 88001

BOOK REVIEW EDITOR

J. Russell Smith
8930 Raven Drive
Waco, Texas 76710

MERCURY RECORDER

Richard G. Hodgson
Dordt College
Sioux Center, Iowa 51250

VENUS RECORDER

Julius L. Benton, Jr.
Piedmont Station, Highland Point
Astronomical Observatory
P. O. Box 839
Clinton, South Carolina 29325

MARS RECORDER

Charles F. Capen
223 West Silver Spruce
Flagstaff, Arizona 86001

ASSISTANT MARS RECORDER

Robert B. Rhoads
8637 E. Palo Verde Avenue
Scottsdale, Arizona 85253

JUPITER RECORDERS

Paul K. Mackal
7014 W. Mequon Road
112 North
Mequon, Wisconsin 53092

Phillip W. Budine
Box 68A, R.D. 3
Walton, New York 13856

SATURN RECORDER

Julius L. Benton, Jr.
Piedmont Station, Highland Point
Astronomical Observatory
P. O. Box 839
Clinton, South Carolina 29325

ASSISTANT SATURN RECORDER

Clay Sherrod
900 Mission Road
North Little Rock, Arkansas 72116

REMOTE PLANETS RECORDER

James W. Young
Table Mountain Observatory
P. O. Box 367
Wrightwood, California 92397

COMETS RECORDER

Dennis Milon
378 Broadway
Cambridge, Massachusetts 02139

LUNAR RECORDERS

John E. Westfall
Dept. of Geography
San Francisco State College
1600 Holloway Ave.
San Francisco, California 94132

Winifred S. Cameron
NASA, Goddard Space Flight Center
Code 601
Greenbelt, Maryland 20771

Kenneth J. Delano
22 Ingell Street
Taunton, Massachusetts 02780

Michael Fornarucci
136 Midland Avenue
Garfield, New Jersey 07026

Christopher Vaucher
6130 S.E. Reed College Place
Portland, Oregon 97202

Roy C. Parish, Jr.
208 Birch Sttreet
Milton, Florida 32570

LUNAR AND PLANETARY TRAINING PROGRAM

Jose Olivarez
Hutchinson Planetarium
1300 North Plum
Hutchinson, Kansas 67501

MINOR PLANETS RECORDER

Richard G. Hodgson
Dordt College
Sioux Center, Iowa 51250

LOOKING

FOR

SOME

GOOD

STAR

CHARTS?

Write for your free copy
of our new 32-page booklet "A"

Sky Publications

SKY PUBLISHING CORPORATION

49-50-51 Bay State Road   Cambridge, Massachusetts 02138