

motion which are produced by the attractions of bodies other than the sun, in order to calculate the actual motion accurately over any very long interval of time.

There are two general methods by which the required corrections to the Keplerian or undisturbed motion may be found: One method is to compute individually the numerical values of the departures at successive intervals of time during the period over which the motion is to be calculated; perturbations so determined are known as special perturbations. This method has the disadvantage that the computation of the successive values, one by one, must be continuously carried on indefinitely from date to date without any break. The other method is to derive general mathematical formulae and tables which will give the values of the perturbations at any particular time desired, without the necessity of having computed them for any other times; perturbations determined in this way are known as general perturbations. Unfortunately, the derivation of general perturbations is an exceedingly difficult and intricate piece of work which in general requires years to complete for any one body.

General perturbations have been determined for the moon and all the major planets (except Pluto); but complete theories of this character are impracticable for comets, and have been constructed for only a few of the minor planets, although the *principal* perturbations of many of the minor plants have been de-

termined in this form. At present, the motions of comets and of the majority of the minor plants are calculated by the method of special perturbations; and because of the labor involved, it is not practicable to compute the motions of very many of the minor planets any more accurately than is necessary to prevent them from becoming lost if observed at every few oppositions.

It is easily possible, with only an elementary knowledge of mathematics and mechanics, to understand clearly the principles of the methods by which the calculations referred to in the foregoing discussion are accomplished; and in the case of the simpler problems, to become able to perform the computations for oneself and to do amateur work of value in some fields. Furthermore, a somewhat detailed understanding of the origin and character of the principal perturbations in the lunar and planetary motions can be acquired without the knowledge of mathematics which is necessary to follow the formulae by which they are computed; excellent and comprehensive non-mathematical explanations will be found in Sir John Herschel's *Outlines of Astronomy* and Sir George Airy's *Gravitation*. These irregularities in the celestial motions are of fascinating interest; and a non-mathematical discussion of them is of the utmost value even to one who has sufficient mathematical training to comprehend the exact analytical treatments.

U. S. Weather Bureau,
Washington, D. C.

Invitation

Joseph E. Boehm, of the Chicago Amateur Astronomical Association, graciously extends an invitation to all amateur astronomers to visit his observatory located at Lake Geneva.

His equipment includes a 14-inch reflecting telescope, 5x7 astro camera with objective prism and double slide plateholder, and other supplementary instruments. Those who visited the observatory last year will note many improvements to telescopes and building.

The premises are located in the Lake Geneva Beach Association Subdivision, on the south side of the lake, three and one-half miles from the city of Lake Geneva. Motorists take route 120, then BB to the first gas station on the right side of the road, then turn right and continue in this direction for two blocks.

Joe suggests to visitors the possibility of staying overnight at one of the convenient hotels, and remarks that the bathing facilities of Lake Geneva are excellent.

Large Disks for Amateur's Telescope Mirror

The size of the amateur's instrument has previously been limited because of his inability to obtain the larger disks at a reasonable cost. Through the cooperation of the Corning Glass Works, 20-inch blanks of the same formula as the 200-inch, are now made available at \$80.00 each on orders for five or more. Several of these are in demand at present and all those interested in obtaining one should communicate with A.A.A.A. headquarters immediately. Purchase may be expected shortly as three disks are already on order.

Several societies affiliated with the A.A.A.A. have furthered the work of amateur astronomy by display of instruments, pictures, and models at local exhibitions. A knowledge of such material available will help to arrange for exhibits to aid in advertising your activity.

Stevinus Color Observations

WALTER H. HAAS

(NOTE: In the March, Planetary Report, Mr. Haas described the color peculiarities in the lunar crater Stevinus, and predicted a list of the times throughout 1936 at which they could be expected to appear. Below are given the observations which have been obtained to date. All the observations were obtained from the Mount Union College Observatory in Alliance, Ohio, except those by Martz which were made at W. H. Pickering's Observatory in Jamaica. The observers have all been organized by Mr. Haas, AAAAA Lunar Director, who has shown unusual energy in this work. No attempt at an explanation

of the phenomena is being attempted until sufficient data is accumulated.

In addition to these notes, which came at our request, Mr. Haas writes in a letter: "Color observations made when the moon is even slightly hazy are quite possibly unreliable. Haze turns the greens to brown, though of course it might not affect brown shadows." He also notes that further observations will be very gladly received; and that they should include, besides the exact time: the aperture, magnification; and record of clearness or haziness of the sky around the moon.

—E. M. Jr., Planetary Director.)

RECORD OF OBSERVATIONS OF STEVINUS (MARCH 25-26, 1936)

Observer	Date	Colongitude	Condition	Moon	Observation
Pugh	Mar. 25-26	305°.8	Moderately hazy		No browns
Benedict	Mar. 25-26	305°.8	Moderately hazy		Very dark and very black
Peeling	Mar. 25-26	305°.9	Moderately hazy		Not as brown as Snellius
Gemmill	Mar. 25-26	306°.0	Moderately hazy		No color
Roth	Mar. 25-26	306°.1	Clear		Walls and shadow brown
Haas	Mar. 25-26	306°.1	Moderately hazy		No brown
Peeling	Mar. 25-26	306°.2	Clear		South part brown
Pugh	Mar. 25-26	306°.2	Clear		A chocolate brown
Roth	Mar. 25-26	306°.3	Clear		S. E. walls brownish-gray
Gemmill	Mar. 25-26	306°.3	Clear		Brown
Francis	Mar. 25-26	306°.4	Very hazy		No colors
Haas	Mar. 25-26	306°.5	Very hazy		No colors
Roth	May 23-24	306°.0	Clear		S. E. shadow greenish-gray
Roth	May 23-24	306°.3	Clear		Hazy gray in S. E.; crater (otherwise, black)
Roth	May 23-24	306°.7	Slightly hazy		Walls and floor brown
Haas	May 23-24	305°.9	Clear		Not as brown as Snellius
Haas	May 23-24	306°.2	Clear		N. E. rim greenish-gray
Haas	May 23-24	306°.6	Slightly hazy.		Black
Haas (1)	Jan. 26-27	307°.7	Very hazy		Reddish-brown (?)
Haas (2)	Dec. 28-29	314°.7	Very hazy		Browner than Snellius
Haas	Mar. 26-27	318°.3	Moderately hazy		Shadow chocolate-brown
Martz (6)	Apr. 25-26	323°.0	Moderately hazy		Nothing unusual
Haas (3)	Mar. 27-28	330°.7	Clear		Shadow brown (?)
Martz (7)	Apr. 26-27	336°.0	Slightly hazy		Nothing unusual
Haas (4)	May 25-26	330°.8	Clear		Shadow chocolate-brown; (floor greenish or brown)
Martz (6)	Apr. 27-28	349°.8	Clear		Reddish-brown, especially in N. W. quadrant
Martz (8)	Apr. 28-29	1°.0	Clear		Coppery outside S. E. rim
Haas (5)	May 25-29	7°.7	Clear		Black at N. tip; brown in N. and S. side south wall
Martz (6)	Apr. 30-May 1	28°.0	Clear		No brown
Martz (8)	May 4-5	77°.0	Very hazy		Brown, especially N. W.
Haas	May 7-8	105°.3	Slightly hazy		Shadow black
Haas (5)	May 7-8	113°.7	Clear		Browner than Snellius
Haas	Apr. 8-9	118°.8	Slightly hazy		Stevinus same as other craters

Clue to reference numbers after names above:

- 1 Solar diagonal (Herschel) 200X, used on 10-inch refractor.
- 2 6-inch reflector with 48X used.
- 3 6-inch reflector with 48X, 96X, 64X, 192X, all showing color.
- 4 10-inch refractor with 134X and 228X.
- 5 10-inch refractor with 228X only, used.
- 6 6-inch, f.15 reflector and 90X, 180X, 360X used.
- 7 6-inch reflector and 3-inch refractor used with 30X to 180X.
- 8 12.5-inch Calver reflector used with 120X.

All the observations were made with a 10-inch refractor and 134X, except those marked otherwise. The striking thing about the two crater shadows (of Snellius and Stevinus) at lunar sunrise is the greater darkness of the Snellius shadow. The color difference is not very great. On May 23-24 Snellius seemed a chocolate-brown to me; to Mr. Roth, however, it appeared perfectly black. I

(continued on page 84)

Meteor Section

FRANKLIN W. SMITH

PART I.

The following Olivier-Hoffmeister program observations have been reported for April and May:

Observer	Location	Region	Minutes	Meteors
Abrahams	Milwaukee	Wis.-N. Ill.	392	13
Boehm	Lake Geneva	Wis.-N. Ill.	180	14
Diedrich	Milwaukee	Wis.-N. Ill.	271	1
Keuziah	Milwaukee	Wis.-N. Ill.	392	19
Schmid	Milwaukee	Wis.-N. Ill.	124	5
Schultz	Milwaukee	Wis.-N. Ill.	139	7
Smith	Glenolden	Tri-State	240	6
Trimmier	Chicago	Wis.-N. Ill.	184	7
8 Observers			1922	72

As may be seen from this table, nearly all of the work has been done by the Wisconsin-Northern Illinois group. The members of this group and their leader are to be congratulated on this fine showing. It is hoped that the other regions will follow their example.

Although Olivier-Hoffmeister program observations require less experience on the part of the observer than some other types of meteor work, it must not be thought that they are of less importance. These observations, when reduced, will yield information about the actual velocities of meteors in space and will thus enable us to determine what proportion of these bodies are permanent members of our solar system and what proportion come to us from the depths of space.

There are, however, other kinds of meteor work which may be profitably undertaken especially at this time of the year when meteors are plentiful. The most important of these is the determination of real heights of meteors from duplicate observations. Any observer

who can arrange to work simultaneously with another about sixty miles away is urged to undertake observations for this purpose. We shall be pleased to furnish further information on the subject to anyone planning an observing program of this kind.

All meteor observers will be interested in the Fifteenth Report of the Meteor Section of the British Astronomical Association (Memoirs of the B. A. A., Vol. 32, Part I) which has recently appeared. This important publication gives an account of work done during the years 1929 to 1931 inclusive. It includes investigations of the major showers, group radiants of minor showers, and radiants and paths of individual meteors. The data are presented in detail and the reader is thus enabled to evaluate the material for himself. In doing this he cannot fail to be impressed by the care which has been taken to maintain a high degree of accuracy throughout.

407 Scott Ave.
Glenolden, Pa.

PART II.

REPORT OF THE WISCONSIN-NORTHERN ILLINOIS REGION

L. E. ARMFIELD

Miss Mary E. Trimmier, in her usual neat and thorough manner, submitted the plotted paths of seven sporadic meteors which she observed during May. Miss Trimmier is now leader of the meteor section of the Chicago group, and is looking forward to a busy as well as fruitful observing season.

Your recorder of meteor observations for this region, in company with E. A. Halbach, recently had the privilege and pleasure of visiting with Dr. Charles P. Olivier and his assistant, Mrs. Doris M. Wills, at the Flower Observatory, headquarters of the American Meteor So-

ciety. It was a rare treat to have the opportunity of conversing with Dr. Olivier and Mrs. Wills, who suggestively direct the efforts of the AMS members and skillfully wrest each final bit of information from their observations. Headquarters is truly an interesting place and your recorder hopes sincerely that other members may have the pleasure of visiting it in the future.

Dr. Olivier and Mrs. Wills extend their cordial best wishes to the members of this region as well as their personal appreciation for the splendid contributions during the past. Let us justify their confidence in us by continued effort.

the satellite to the "Syrtis Major" marking. The northern polar cap has seemed markedly bright and white to all the observers mentioned except Douglass, and there seems to be some indication that the southern cap is also white. Aside from occasional, small, transient white areas noted by Pickering, and appearing to the writer to be very much like localized clouds, there is evidently a well developed system of cloud belts shifting back and forth in latitude over the tropical and temperate zones of the satellite, often obscuring the surface detail. These have been seen and drawn by all the observers including Barnard. From his preliminary observations and study, it appears possible that, aside from its very peculiar shape of a prolate ellipsoid

which is possibly due to ejection from and tidal drag of Jupiter, the surface of Ganymede is in very much the same stage of evolution that, let us say Mars was one or two geological periods back. Its present condition indicates a definitely consolidated surface with areas of vegetation, possibly snow or ice at the poles, as testified by the intense greens and whites, and a heavy cloud system such as the earth has at present.

In conclusion, it is hoped that amateur observers with sufficiently good seeing conditions and telescopes of eight inches aperture or larger will continue this highly promising investigation of Jupiter's third satellite as it is well within their power to do so.

W. H. Pickering Observatory,
Mandeville, Jamaica, B. W. I.

Nova Program Notes

L. E. ARMFIELD

Apologies are hereby given for the absence of these notes in the June issue of Amateur Astronomy. Instead of compiling the report, your recorder of nova program observations in company with E. A. Halbach, attended the annual spring meeting of the AAVSO.

We are extremely grateful for the share of attention the nova search received at the meeting and welcome heartily the many new members who enlisted in the work.

We wish to extend our heartiest congratulations to Mr. E. Loreta of Bologna, Italy, for his independent discovery of Nova Lacertae. Although Mr. Loreta has recently offered to participate in the nova program, the systematic search cannot be given credit for any part of the discovery as he had not received the regions reserved for him prior to the appearance of the star.

The following observations were received during April and May.

Observer	Region Number	Month	Magnitude of faintest star visible							Total Nights
			7	6	5	4	3	2	1	
Abrahams	59	May	....	3	....	....	....	....	....	3
Ballhausen	57	May	....	4	....	....	....	....	....	4
Diedrich	43	April	....	2	4	....	....	....	1	7
	43	May	....	10	1	....	1	....	....	12
Hamilton	**	April-May	....	....	1	....	11	....	....	12
Keuziah	40	May	....	....	1	....	....	....	....	1
Loepfe	42	April	....	....	1	....	....	....	....	1
	42	May	....	5	4	....	....	....	....	9
Moore	26	May	....	....	11	4	....	....	....	15
Rosebrugh	52	April	3	3	....	....	....	....	....	6
	1	May	1	13	2	2	1	....	....	19
Schmid	39	May	....	4	3	1	....	....	....	8
Trimmier	8	April	....	....	1	6	3	2	....	12
	8	May	....	....	1	5	6	5	....	17
Seely	58	May	....	....	2	1	....	....	....	3

11 Observers.
2046 S. 59th Street,
Milwaukee, Wis.

Occultations

R. D. COOKE

Occultation predictions for Milwaukee and vicinity, during August, 1936.

Date	Star	Mag.	Immersion	Pos. Angle
Aug. 23	43B Librae	5.8	5:58 P. M.	90°
Aug. 24	32B Scorpii	5.4	9:44 P. M.	152°
Aug. 27	117B Sagit	5.8	9:37 P. M.	111°
Aug. 30	72B Aquarii	6.5	11:35 P. M.	45°

6811 Cedar Street,
Wauwatosa, Wis.

AAAA Notes

As promised in the May issue of Amateur Astronomy, AAAA members in the Chicago Region are listed below:

J. L. Adkins.....	9346 S. May St.,	Chicago, Ill.
Malcom Andersson	1453 Keeney Ave.,	Des Plaines, Ill.
S. S. Benjamin	1134 Fletcher St.,	Chicago, Ill.
O. J. Bliss.....	9951 S. Seeley Ave.,	Chicago, Ill.
Joseph E. Boehm.....	3511 N. Seminary Ave.,	Chicago, Ill.
Dr. J. Bretz.....	Geology Dept., U. of C.	Chicago, Ill.
Frank B. Burns	3819 Maypole St.,	Chicago, Ill.
Wm. Callum	1319 W. 78th St.	Chicago, Ill.
Perry Cafferty	861 Fletcher St.,	Chicago, Ill.
Prof. A. H. Carpenter.....	811 Bell Ave.,	La Grange, Ill.
L. M. E. Clausing.....	5509 Lincoln Ave.,	Chicago, Ill.
F. Daniek	1147 W. 17th St.,	Chicago, Ill.
Moses Davis	427 S. La Salle St.,	Chicago, Ill.
O. G. Durham	Abbot Laboratories	Chicago, Ill.
S. J. Fairbanks		Chicago, Ill.
C. W. Finical.....	528 Highland Ave.,	Chicago, Ill.
Ludwig Grandl	627 S. Grace St.,	Waterloo, Ia.
G. Hansen	5425 Walton St.,	West Chicago, Ill.
J. P. Jensen	5529 S. Dorchester Ave.,	Lombard, Ill.
E. P. Kennedy.....	3216 Scoville Ave.,	Berwyn, Ill.
G. F. Kernan	1339 W. 92nd St.,	Chicago, Ill.
Alfred Klapperich	412 Central Ave.,	Wilmette, Ill.
Earl Laing	120 Belle Plaine Ave.,	Park Ridge, Ill.
James A. Longman.....	2318 Sunnyside Ave.,	Chicago, Ill.
C. S. Loomis	1126 Ainslee St.,	Chicago, Ill.
Gerald E. McCord	617 N. Kenilworth Ave.,	Oak Park, Ill.
John McNeil	8538 St. Louis Ave.,	Evanston, Ill.
Ed. Martz, Jr.....	c/o Prof. W. H. Pickering	Mandeville, Jamaica, B. W. I.
J. M. Mockus	716 W. 17th Place	Chicago, Ill.
G. H. Olewin	2619 Marmora Ave.,	Chicago, Ill.
E. H. Olson	10156 Yale Ave.,	Chicago, Ill.
John Prugh	399 Fullerton Ave.,	Chicago, Ill.
Russel Risdon	819 Cornelia Ave.,	Chicago, Ill.
F. H. Schaffer		Lockport, Ill.
Mary E. Trimmier	1847 Cleveland Ave.,	Chicago, Ill.
Wm. Vanderhoop	10445 S. State St.,	Chicago, Ill.
George E. Warner.....	7655 S. Wabash Ave.,	Chicago, Ill.

Edward Halbach and Luverne Armfield had the privilege and pleasure of visiting with many prominent AAAA members after the AAVSO meeting in New York. To mention them all by name would be a partial reproduction of AAAA membership roster; consequently, it will suffice to repeat their joint expression, "Astronomers, amateur or professional, are splendid people, with emphasis on the splendid."

It may be of interest to know that the AAAA has passed its first birthday. The association is a mere infant, to be sure, but its accomplishments during the brief span of a year are highly gratifying. Lack of space prohibits even a short summary of the progress made; however, it is impossible to compliment too highly the many contributions made by every member and friend of the association. No one person can be singled out as the major contributor as all concerned have given their utmost to the cause.

Stevinus Color Observations

(continued from page 80)

think it significant that, of the observations of March 25-26, all those made when the moon was clear call Stevinus browner than Snellius. Only Mr. Peeling called Snellius the browner, and the sky when he observed was hazy. As the shadows get smaller, I usually see in Stevinus a chocolate-brown hue not present in Snellius. I have seen this color in many craters with three different telescopes (Pickering's 12.5-inch, Mt. Union's 10-inch, and my own 6-inch). I think that this is partly subjective with me. The best way, of course, is to compare suspected brown shadows with neighboring shadows. The brown noted by me on May 28-29 was a sort of tan; it was hardly coppery. The moon was then quite clear. No color filters have yet been used in this work.

Miller Hall, Mount Union College, Alliance, O.

The official monthly publication of
American Amateur Astronomical Association

Publication Headquarters
 2046 S. 59th St., Milwaukee, Wis.

Affiliated Societies

Amateur Astronomers Association of Pittsburgh,
 Pennsylvania.
 Amateur Telescope Makers of New York, N. Y.
 Astronomers Guild of Jamestown, New York.
 Astronomical Society of Rutherford, N. J.
 Chicago Amateur Astronomical Association, Chi-
 cago, Ill.
 Long Island Telescope Makers, Wantagh, N. Y.
 Louisville Astronomical Society, Louisville, Ky.
 Madison Astronomical Society, Madison, Wis.
 Metropolitan Astronomical Society, New York,
 New York.
 Milwaukee Astronomical Society, Milwaukee, Wis.
 New Jersey Astrophysical Society, Woodbridge,
 N. J.
 Norwalk Astronomical Society, Norwalk, Conn.

Editorial Staff

Miss Elizabeth Wight, Editor
 Mrs. A. K. Fisher Miss Carolyn Nickels
 E. A. Halbach H. L. Grunwald

Advisory Editors

Prof. Leon Campbell — Variable Stars.
 Prof. Charles P. Olivier — Meteors.
 Prof. George Van Biesbroeck — Asteroids, comets,
 and double stars.

Ten cents per copy, \$1.00 per year.

Membership in AAAA, \$1.00 per year,
 including subscription.

Send all communications to the above address.

Canopus

When quacks with pills political would
 dope us

When politics absorbs the livelong day,
 I like to think about the star Canopus
 So far, so far away.

Greatest of visioned suns, they say who
 list 'em;

To weight it science always must despair.
 Its shell would hold our whole dinged
 solar system,
 Nor know 'twas there.

When temporary chairmen utter speeches,
 And frenzied henchmen howl their bat-
 tle hymns,

My thoughts float out across the cosmic
 reaches

To where Canopus swims.

When men are calling names and mak-
 ing faces,

And all the world's a jangle and a jar,
 I meditate on interstellar spaces
 And smoke a mild seegar.

For after one has had about a week of
 The arguments of friends as well as foes,
 A star that has no parallax to speak of
 Conduces to repose.

—Bert Leston Taylor.

1936 AAVSO Annual Spring Meeting

The 25th annual spring meeting of the AAVSO was held in the American Museum of Natural History in New York City on May 22-23 and the following report is brought to us by the two Milwaukee members in attendance. It was fortunate that Ed Halbach and Luverne Armfield could so arrange their vacation schedules to include this meeting and represent the mid-west. At the principle session the various observation programs sponsored by the association were discussed with particular emphasis on red variables, visual nova search, occultations and photographic observations.

In the evening the delegates were invited to attend the regular meeting of the Metropolitan Astronomical Society at the Museum of Science and Industry in Radio City, which was preceded by a dinner at the Gateway restaurant. The meeting was devoted to a general discussion of astronomical activities followed by a visit with members of the Rutherford amateur astronomers.

One full day's entertainment was supplied by Mr. Andrews who pointed out New York's highlights on a well conducted tour of the city. The event reached its climax at a dinner prepared by Mrs. Seely, and an enjoyable evening's conversation.

On another occasion the unveiling of busts of Simon Newcomb and William Penn was witnessed in the Chapel of New York University. This interesting event was arranged through the thoughtfulness of Dr. Shapely.

The return trip was punctuated by another series of enjoyable visits at Upper Darby, Pittsburgh and Chicago. Upper Darby is the address of Flower Observatory, headquarters of the American Meteor Society, where Vern and Ed exchanged ideas with Dr. Olivier and his assistant Mrs. Doris M. Wills.

Leo J. Scanlon entertained at Pittsburgh by showing the points of interest about the city. His Valley View Observatory and workshop were especially interesting and are reported by our representatives as being well designed and constructed.

Sunday was spent with Mr. and Mrs. Callum of the Chicago Society and the last leg of the journey completed that evening. The influence of these meetings on the delegates will undoubtedly find expression in the observational reports and news or feature articles prepared by them for publication in Amateur Astronomy.

Chicago News

CHICAGO AMATEUR ASTRONOMICAL
ASSOCIATION

WM. CALLUM, Secretary

The Chicago group paid its long threatened visit to Milwaukee on Saturday, June 6. The turnout from Chicago was somewhat disappointing as less than one third of those who had planned on going made the trip. Business must be attended to, of course, but time spent learning a little about astronomy and out under the stars is rewarded with a soul-satisfying pleasure which no business depression can take from us.

The members who went along certainly had a most interesting and instructive time. We were met by Mr. Armfield and Mr. Halbach and conducted to Jacobus Park where a fine lunch had been prepared for us. After partaking of this, R. D. Cooke, president of the Milwaukee group, called the meeting to order and welcomed the Chicago visitors. Then Mr. Armfield and Mr. Halbach reported on the AAVSO meeting in New York, which they attended. Mr. Halbach showed some photographs which he had taken during the trip. After some articles were read and discussed, we adjourned to Mr. Cooke's home, which is a real amateur astronomer's home, with a lot of professional-looking instruments in and around it. Mr. Cooke has a fine 9-inch reflector with clock drive, through which we viewed Jupiter and the new Peltier comet. There is also a fine finished spectroscope with coelostat mounted in the yard and the spectrum of the moonlight was thrown on a screen. Then we were shown movies of eclipses of the sun and moon which were taken by Mr. Cooke. This would have been more than enough for any evening, but we went on to Mr. Armfield's home where there is a 10-inch and a 13-inch mounted in the yard. These instruments are used every clear night by a group of enthusiasts. There is an ingenious instrument for recording the time of meteor observations which enables the recorder to remain inside and take the reports from the observers outside. This was designed and made by Mr. Halbach. On Sunday we visited the homes of Mr. Halbach and Mr. Grunwald and saw many interesting tools and pieces of equipment. Then we were driven around the city and along the lake front to finish up a glorious visit. We thank the Milwaukee Astronomical Society for its cordial hospitality and hope that we will have the privilege of being hosts to them in the near future.

We are glad to have J. A. Wingard with us again. He has been in the hospital all winter but is now fully recovered. He will soon be doing some good work with his fine 10-inch.

We hear from Yerkes that the tests of the Schmidt mirror and correcting plate made by Carl Nicholson for use on the large telescope in the McDonald Observatory are very satisfactory. The star images obtained with short exposures are the best they have seen with any camera, and their size is limited by the grain structure of the photographic plate. This is a very difficult task well done.

Miss Mary Trimmier, 1847 Cleveland Ave., Chicago, is head of the meteor section for Chicago. She is working on the Olivier-Hoffmeister program. Any members who are interested with this work please communicate with her or the secretary.

Charts for the AAVSO nova search program will be out in a few days. George F. Kernan is leader in this field for Chicago and will be glad to hear from those interested. Both of the above activities can be done without instruments.

1319 W. 78th Street,
Chicago, Ill.

Tri-State News

AMATEUR ASTRONOMICAL ASSOCIATION
OF PITTSBURGH

LEO J. SCANLON, Regional Organizer

During the month of July no great concerted activity is anticipated in Pittsburgh. As reported last month, the group traveled to Wheeling, W. Va., and there with their portable telescopes enjoyed one of the finest sights in the sky they had seen for years—the Peltier Comet—and a view of the Milky Way in all its splendor as we never see it in the vicinity of Pittsburgh.

Later in the month of June quite a large delegation went to the Twin Elms Observatory of Maude S. Wiegel, to open officially the summer season. Several telescopes were in evidence and were used to good effect in the clear atmosphere of Elizabeth, Pa.

Officers of the society are S. S. Weisiger, Jr., president; Fred M. Garland, vice president; Leo J. Scanlon, secretary-treasurer.

Valley View Observatory,
Pittsburgh, Pa.

Milwaukee News Notes

MILWAUKEE ASTRONOMICAL SOCIETY
HERBERT L. GRUNWALD, Correspondent

The June meeting of the MAS proved to be an interesting and pleasant divergence from our standard form. Previous correspondence revealed that the Chicago Amateur Astronomical Association accepted our invitation to have a joint meeting, and the date of June 6 was set.

The festivities commenced with a picnic lunch prepared by the ladies of the society under the direction of Mrs. Cooke, the wife of our president, in the pavilion at Jacobus Park, Wauwatosa. Our guests included Miss Mary E. Trimmier, director of the Chicago meteor section, President Wm. Callum and Mr. Katyll. It is unfortunate that the other members of the Chicago group could not attend the luncheon, but Messrs. Joseph Boehm, Ed Mittendorf and Russel Risdon met us later at Mr. Cooke's home where the instruments of his manufacture were demonstrated. Motion pictures of the 1935 eclipses of the sun and moon portrayed the results of experiments with Mr. Cooke's apparatus.

While still assembled at the park those present were favored by an entertaining narrative given jointly by Edward Halbach and Luverne Armfield concerning their experiences at the AAVSO annual spring meeting in New York. Mr. Cornell read some astronomical high lights that appeared in recent issues of the Milwaukee press and from a Philadelphia newspaper. The Philadelphia paper runs a monthly series of articles on astronomy, and hopes were expressed that Milwaukee and Chicago might some day be favored by such a series in one of their evening papers. Herbert Grunwald then read a paper which he condensed from an article appearing in the Ceramic Bulletin of April 1936, dealing with the construction of a 62-inch mirror in 1895. The work was done by John Peate, a retired preacher, and up to the completion of the 200-inch will remain the only one processed in its entirety, including the casting of the glass, in the United States.

After leaving Mr. Cooke's home, the activities were centered at MAS headquarters where observing programs in the various branches were discussed.

The three Chicago visitors first mentioned remained in the city until Sunday evening, spending the day inspecting the equipment of some of the other members and completing a short tour of the city.

To make an already fruitful event complete, the combined party was favored by the visit of J. Wesley Simpson

who directs the activities of the M-Sio observers. Mr. Simpson gave an interesting account of the work of their observatory and in particular the meteor program and meteorite search that he is conducting.

2431 N. 46th Street,
Milwaukee, Wis.

NAS Star News

NORWALK ASTRONOMICAL SOCIETY
L. L. DOOLITTLE, Secretary

Members of the Norwalk Astronomical Society are now commencing to settle down to the quiet summer months, when all regular activities cease, prior to the big annual "round-up" in September. The only regular activities carried on are the individual observing programs of a few members, and the regular work and meetings of the meteorological department.

The regular monthly meeting was held on June 5, one week later than usual, as it took NAS members a week to settle back after the spring meeting of the AAVSO in New York. Richard Hamilton gave an interesting lecture on two important New York events which he attended: the AAVSO meeting, and the unveiling of busts of Simon Newcomb and William Penn in the Hall of Fame, New York University. The secretary followed this with an historical outline on the development of telescopes, illustrating his talk with lantern slides, some of which included the 200-inch.

The last meeting of the season was held on June 26, for the first time out-of-doors, at the residence of member P. E. Jacobs. Then comes the lull before the storm, the storm being the second annual meeting in September!

During the summer months, the secretary will have a self-constructed 6-inch reflector in a local amusement park. Although the focal ratio is f.5.5, the tube will be about 8 feet in length, to heighten the effect of a giant telescope. Oy, oy, what a beezezz! He hopes no technicians ask, since it is a Newtonian reflector, why the eyepiece is more than halfway down the tube towards the mirror.

Tentative plans are being formed to have a number of members stationed with their telescopes in the city's park some night this summer, in an endeavor to stimulate further interest in astronomy among the general public.

P. O. Box 341,
South Norwalk, Conn.

later workers to use. That there are changes on the moon affecting areas larger than Rhode Island is an observable fact. The study of fine detail on the moon may lead to results of great significance, interest, and importance.

During the present year (1936) we are continuing the same type of lunar work. At Mount Union Observatory we are observing Plinius, Aristarchus, Eratos-

thenes, Messier, and Grimaldi. Mr. Martz, now in Jamaica, is also working on the moon. We have not received observations from anyone as yet, but shall be very happy to do so. The outlook for useful lunar work this year is indeed bright.

Miller Hall, Mount Union College,
Alliance, Ohio;
and: New Waterford, Ohio.

Amateur astronomers were grieved to learn of the death of William Tyler Olcott in July 1936. Mr. Tyler was an amateur of long standing, having founded the AAVSO in 1917. A brief account of his work as an amateur astronomer will appear in the next issue of this magazine.

TELESCOPE MAKERS

We have everything for the
AMATEUR TELESCOPE MAKER
Mirror Kits, Prisms, Eye Pieces, etc.

PYREX MIRRORS made to order. We do polishing, parabolizing and aluminizing. Free catalog upon request.

PRECISION OPTICAL SUPPLY CO.
PRECISION OPTICAL SUPPLY CO.
991 E. 163rd Street New York City

Nova Program Notes

L. E. ARMFIELD

We heartily welcome initial contributions from Miss Ballhausen, Mrs. Thomas and Miss Trimmier, Messrs. Cox, Kirkpatrick and Peck.

Increasing interest and renewed effort is evident in the following report of nova program observations received during the month of June.

Observer	Area	Location	Magnitude of faintest star visible						Total Nights	
			7	6	5	4	3	2		
Abrahams	59	Milwaukee	....	20	1	1	....	....	....	22
Ballhausen	57	New York	7	4	3	2	1	....	..	17
Cox	62	New York	....	3	....	....	....	....	....	3
	95		....	6	....	....	....	....	....	6
Diedrich	43	Milwaukee	....	6	1	1	....	1	....	9
Doolittle	85	Norwalk	....	6	....	....	....	....	....	6
	77		....	....	3	....	....	....	....	3
Halbach	....		....	....	2	....	....	....	....	2
Kirkpatrick	61	New York	3	....	....	....	....	....	....	3
Peck	15	Milwaukee	....	4	....	....	....	....	....	4
	57		....	2	....	....	....	....	....	2
Rosebrugh	1	New York	7	3	2	....	....	....	....	12
Schmid	39	Milwaukee	....	6	4	2	....	....	....	12
	13		....	6	3	2	1	....	....	12
Seely	58	New York	....	3	5	1	....	....	....	9
Thomas	3	Cambridge	....	....	3	3	....	....	....	6
Trimmier	60	Chicago	....	....	10	3	....	1	....	14
	8		....	....	5	5	2	2	....	14

12 Observers

156

Meteor Section

FRANKLIN W. SMITH

PART I.

The following Olivier-Hoffmeister program observations have been reported for the month of June:

Observer	Location	Region	Minutes	Meteors
Abrahams	Milwaukee	Wis.-N. Ill.	455	29
Boehm	Lake Geneva	" " "	480	*49
Diedrich	Milwaukee	" " "	135	14
Halbach	Milwaukee	" " "	60	1
Kendall	Milwaukee	" " "	270	12
Ketarkus	Milwaukee	" " "	64	2
Keuziah	Milwaukee	" " "	242	18
Knott	Milwaukee	" " "	120	3
Loepfe	Milwaukee	" " "	75	8
Mittendorf	Lake Geneva	" " "	500	**41
Schmid	Milwaukee	" " "	880	47
Schultz	Milwaukee	" " "	242	16
Sidoff	Milwaukee	" " "	122	11
Smith	Glenolden	Tri-State	230	***22
Taylor	Milwaukee	Wis. N. Ill.	60	2
Trimmier	Chicago	" " "	1172	**52
16 Observers			5107	327

*7 plotted, **6 plotted, ***All plotted.

Again we are indebted to the Wisconsin-Northern Illinois group for practically all of the observations. Preliminary reports of work done elsewhere have been received but unfortunately the data are not yet available. All observers are requested to report their work to their regional directors as promptly as possible so that it may be received here in time for inclusion in the general report.

The two major meteor showers which occur at this time of the year (the delta Aquarids reach a maximum on July 28 and the Perseids reach a maximum on Aug. 11) furnish such a large percentage of the meteors seen that the interval between these dates is not suitable for Olivier-Hoffmeister program observations. It is, however, favorable for height determinations; but this year the moon is full on Aug. 2 and in the third quarter on Aug. 9, and for this reason the period just after the Perseid maximum will be more favorable for observing than the period just before that time. Since fewer heights have been determined for Perseids than for Leonids, it is especially important for observers to undertake this work whenever possible.

A number of minor showers are usually active during these months, and it is hoped that the work now in progress will yield a number of group radiants for these showers. The following list of group radiants obtained by the writer at this time last year is added for purposes of comparison.

No.	Date 1935	R. A.	Dec.	No. of Meteors	Length of Watch (minutes)	Total No. of Meteors
1.	July 26.8	296°	-8°	5	240	27
2.	26.8	310	+5	6	240	27
3.*	26.8	340	-15	9	240	27
4.	Aug. 4.8	0	+55	10	150	27
5.	23.8	345	-0	8	270	37

*Delta Aquarids.

407 Scott Ave.,
Glenolden, Pa.

PART II.

REPORT OF THE WISCONSIN-NORTHERN ILLINOIS REGION

L. E. ARMFIELD

The number of minutes observed by members of this region mounted to a very gratifying total during the month of June. Special commendation must be given to Mary E. Trimmier, Joseph E. Boehm and Edward Mittendorf, all of the Chicago Amateur Astronomical Association for their splendid contributions, both to the Olivier-Hoffmeister program and duplicate height observations. The summer season also finds the Milwaukee observers swinging into action along the meteoric front with Schmid and Abrahams leading the attack.

The following observations of telescopic meteors have been gratefully received during the last few months:

Observer	Location	Aperture of Telescope (in)	Minutes at Eyepiece	Period	Telescopic Meteors
Callum	Chicago	8	1387	Jan. 1-May 31	2
McNeil	Chicago	8	no record	Jan. 1-May 31	2
Martz	Chicago	6	*2735	1935	6
Seely	New York	6	257	Oct.-Dec. '35	1
			257	Jan.-June '36	1
4 Observers			4636		112
*2135 minutes devoted to planetary and lunar observing.					

Planetary Report No. 12

OBSERVATIONS OF VENUS WITH
COLOR FILTERS
ED MARTZ, Jr.

As we have previously, in several places, advocated the use of color filters for observations of planetary detail, we are very happy to have received a communication from the well known German amateur astronomer, Herr Wolf Wendel-eid Spangenberg, describing some of the interesting and significant results he has obtained during the last few years in observing the planet Venus with different color filters. In notes published in *Popular Astronomy* in 1933-4, the writer described his successful use of a deep red filter, and of Wratten KI and K2 orange filters at the eyepiece, reducing scattered sky light, telescopic aberrations, and in bringing out Venusian nepheloidal markings. Recent work in Jamaica in observing Jupiter with a light yellow shade glass has shown the further advantages of these filters in bringing out the fine wisp detail. There has been also a markedly better, clean, sharp, hard disk of Satellite III, and the other Jovian satellites when using this filter; and the surface details of III have been brought out much more clearly by it.

ACTIVITY IN THE NORTHERN HEMISPHERE OF JUPITER—CORRECTION

In the June, 1936, Planetary Report No. 10, a systematic error was introduced by the present writer in the Jovian longitudes of the disturbances etc. as given. To each of the longitudes given, except the first one, 180° should be added. If necessary, 360° should then be subtracted from those longitudes which are in excess of 360° after correction. Thirty-five drawings of the planet have now been obtained from Jamaica by the writer, at Prof. W. H. Pickering's observatory, and will be discussed in the near future with a series being obtained by Walter Haas, with the 9-inch refractor

of Mount Union College Observatory. Latimer J. Wilson writes us in regard to Jupiter: "I find the present longitude of the Red Spot to be 143° (II). The Spot itself has been distinctly visible. The south tropical disturbance, which should be in about longitude 323° (II), is missing. Only once was a faint impression of its presence seen. I cannot say that my 4¼-inch telescope has disclosed green in the colors of the disk, but the temperate belts seem to bear a bluish tint, while the red in the north equatorial belt varies from dusky to cherry color. The red Spot appears a delicate pink, and on June 9, at 5^h 13^m GCT, contained a white cloud. I calculate the rotation period since July, 1935, to be 9^h 55^m 30.^s117. * * * The Rev. T. E. R. Phillips, for many years director of the Jupiter section of the British Astronomical Association, also writes us: "It is very important that attention should be given to the study of Saturn and Jupiter, especially the latter, during the next few years elsewhere than in this country (England); particularly as conditions will preclude us (the B. A. A.) from doing much with Jupiter. I very much hope that your section (AAAA) will be able to carry on systematic work on the lines indicated in my account of telescopic observations in the note I am sending." Rev. Phillips' reference was to his paper on "Planetary Atmospheres" in the *Monthly Notices of the Royal Astronomical Society*, February, 1936. . . . In conclusion, let us again request that all planetary and lunar observations and drawings made in 1935 by AAAA members be sent to 726 N. Elmwood Ave., Oak Park, Ill., for inclusion in the AAAA Planetary Report for 1935, now in the process of composition.

Prof. W. H. Pickering Observatory,
Mandeville, Jamaica, B. W. I.

The official monthly publication of
American Amateur Astronomical Association

Publication Headquarters
 2046 S. 59th St., Milwaukee, Wis.

Affiliated Societies

Astronomical Society of Rutherford, N. J.
 Amateur Astronomers Association of Pittsburgh,
 Pennsylvania.
 Amateur Telescope Makers of New York, N. Y.
 Astronomers Guild of Jamestown, New York.
 Chicago Amateur Astronomical Association, Chi-
 cago, Ill.
 Long Island Telescope Makers, Wantagh, N. Y.
 Louisville Astronomical Society, Louisville, Ky.
 Madison Astronomical Society, Madison, Wis.
 Metropolitan Astronomical Society, New York,
 New York.
 Milwaukee Astronomical Society, Milwaukee, Wis.
 New Jersey Astrophysical Society, Woodbridge,
 N. J.
 Norwalk Astronomical Society, Norwalk, Conn.

Editorial Staff

Miss Elizabeth Wight, Editor
 Mrs. A. K. Fisher Miss Carolyn Nickels
 E. A. Halbach H. L. Grunwald

Advisory Editors

Prof. Leon Campbell — Variable Stars.
 Prof. Charles P. Olivier — Meteors.
 Prof. George Van Biesbroeck — Asteroids, comets,
 and double stars.

Ten cents per copy, \$1.00 per year.
 Membership in AAAA, \$1.00 per year,
 including subscription.

Send all communications to the above address.

Readers of Amateur Astronomy should make every effort to obtain new subscriptions or new members, since it is only through an increase in circulation that the continuation of this publication is guaranteed. A number of contributing societies are in arrears in their payments so it will become necessary to combine the September and October issues if this money is not available by Aug. 20. Amateur Astronomy is your publication, and it will grow in proportion to the time and effort of each and every member of the AAAA.

In the past a number of articles have been printed which were most difficult to understand without the aid of illustrations or photographs, however, the magazine funds are too low to permit this extra expense. Is there anyone among our readers who is in the photo-engraving or printing trade who would volunteer to furnish an occasional cut to liven feature articles?

NAS Star News

NORWALK ASTRONOMICAL SOCIETY
 L. L. DOOLITTLE, Secretary

With the preparing of these notes for Amateur Astronomy, the writer pens his last news notes for the NAS. Regretfully, he will be forced to hand in his resignation as secretary at the annual meeting, due to his studies at Syracuse University which start in September. He has found his work in the society a source of enjoyment, and has watched the membership list grow from four members (of which he was one) in Sept., 1934, to a present list of approximately 35 members. Since March, 1935, he has conducted a weekly astronomical column in a local newspaper. If his work has in some small way been of aid to his fellow members of the NAS and his writings have brought enjoyment to a few, he will feel amply repaid.

Also forced to resign from the society due to coming college activities will be treasurer Richard Hamilton, who is leaving in September for Trinity College.

The writer wishes to welcome Phillip Jacobs who will take over the activities of secretary. Hereafter, he will be in charge of this column, and also the newspaper work.

On the evening of July 13, NAS members were the guests of Mrs. Edna Klaber of East Norwalk, when 12 astronomers came to Norwalk from the Amateur Astronomers Association of New York City. The evening was spent in viewing the planet Jupiter, the nova, comet, and other interesting celestial sights. Informal discussions continued throughout the evening.

Phillip Jacobs is now diverging from his meteorological work, to join the ranks of the variable star observers of the AAVSO. Mr. Jacobs is also at present sending daily weather predictions to a local paper.

Observing programs for July and August are in the fields of meteorology, nova search, variable stars, and meteors. Some of the members are making plans to observe the three meteor showers of these months, the Capricornids, delta Aquarids, and Perseids, weather permitting.

The exact date for the second annual meeting has not been set as yet, but it will be either the latter part of August or first part of September. The committee in charge hopes to secure Miss Catherine Stillman of the Vassar Observatory, member of the Harvard-MIT eclipse expedition to Russia, as guest speaker for the evening banquet.

P. O. Box 341
 So. Norwalk, Conn.

Milwaukee News Notes

MILWAUKEE ASTRONOMICAL SOCIETY
HERBERT L. GRUNWALD, Correspondent

Only a limited amount of planetary observation has been done in the past by the Milwaukee group but one of our new members is primarily interested in that phase of astronomy and has proceeded to outfit himself for that work. It was just a little over one month ago that A. C. Tabbatt stepped into our headquarters at 2046 So. 59th Street and explained his interest in astronomy to those present. Here it was learned that he enjoyed planet study and was using a two inch refractor, but that he wanted to secure a larger instrument more suitable to that work. Before the evening was over Halbach and Loefke had volunteered to combine their talents and construct a telescope designed for planet study in accordance with the suggestions of Mr. Tabbatt. The mirror, ground, polished, and figured by Loefke, is 8 inches in diameter with a focal ratio of f.15.25 or an equivalent focal length of 122 inches, and a reflecting surface of aluminum. Halbach's mounting consists of a large round cast iron base, suitable for rigid location on the roof of an apartment building, with an upright or standard of 6-inch diameter pipe $3\frac{1}{2}$ feet long welded to this base and to a flange carrying the equatorial head. A selection of welded structural pieces, castings, and standard fittings are combined to make a strong equatorial assembly. The tube made of galvanized sheet iron is 120 inches in length and $9\frac{1}{2}$ inches in diameter with cleverly attached fixtures such as eyepiece rack, mirror cell, finder and special grips for handling the long instrument. The telescope was tested on July 11 and pronounced satisfactory by the technicians who constructed it, Mr. Tabbatt, and others present. With only minor adjustments and final fastening in its permanent location yet to be accomplished, the telescope is ready for use in its specialized field.

Our column in the July issue included acknowledgement of a visit by J. Wesley Simpson who directs the activities of the Missouri-Southern Illinois observers and at this time we announce a return visit. Mr. Simpson stopped at headquarters on Thursday, June 25 and met Art Peck and Verne Armfield. After a discussion of current problems the trio motored to Camp Minikani operated by the Y. M. C. A. where Scott Houston directs the activities in astronomy and is building a small observatory. After the visit Simpson again returned to his summer location in Door County to resume his activities at a boys' camp there.

On July 8 Mr. Cornell attended the meeting of the Madison society and addressed the assembly on the subject of the earth and moon. This talk is one of a series sponsored by the Milwaukee group for the instruction and entertainment of the society at the capitol city. According to the schedule set forth Ed Halbach will perform this mission at their August meeting.

Through a notice in the Sunday Milwaukee Journal, the general public was invited to view the recently discovered comet through telescopes at any of six places about the city on the three nights, Sunday, Monday and Tuesday, July 26, 27 and 28. Telescopes were located at the following addresses together with the number in attendance at each place.

L. E. Armfield, West Allis, 355
13, 10, 4 and 3-inch telescopes.
R. Bautz, north side, 225
10 and 4-inch telescopes.
R. Evans, Shorewood, 170
5-inch refractor.
R. D. Cooke, Wauwatosa, 107
8-inch reflector.
E. A. Halbach, west side, 305
8 and 6-inch reflectors.
A. L. Peck, downtown, (?)
4½-inch refractor.

The public acceptance of the invitation is reflected in the following excerpts from an article appearing in one of the evening papers:

NEIGHBORS SEE COMET;

"THANKS" ONLY CHARGE

(Milwaukee Leader—July 28)

"A little group of something like 30 men, women and children stood on the well kept rear lawn at 4046 North Fifteenth st. last night. They had already followed the American instinct of forming a line. But there was utter quiet and not the buzz of conversation one would expect from a group of that number.

"They were waiting their turn to look through a telescope and see the newest visitor in the skies, Peltier's comet.—

"And then silently, with a whispered "Thank You" the callers left. Outside, the street was lined with automobiles of others who came to see the wonders of the sky. And the line grew steadily longer.—Something a group of interested Milwaukeeans are doing for other Milwaukeeans who are interested but haven't the equipment. One feels grateful to such a society."

2431 N. 46th Street,
Milwaukee, Wis.