

# AMATEUR ASTRONOMY

Published monthly by the American Amateur Astronomical Association

Vol. 3, No. 9

November, 1937

Ten Cents

## Mechanical Analogue of a Long Period Variable Star

By PAUL W. MERRILL

Imagine a complicated machine with many moving parts—levers, gears, pulleys, and belts. Many things happen: wheels turn at intervals, signal lights flash on and off, but the chief occurrence, to which all others appear subordinate, is the slow rise and fall of a vertical piston which projects above the rest of the apparatus. Now throw a blanket over the machine so that it is completely hidden, and you have a mechanical analogue of a long-period variable. All you can see is a rhythmic rise and fall of a hump in the blanket caused by the motion of the piston. It is pretty hard to guess what is going on inside; you can be sure some repeating mechanism is at work but its exact nature and whether its operation is mechanical, hydraulic or electrical you cannot tell.

Distance is the astronomical blanket thrown over a variable star to prevent us from seeing the component parts. It contracts the vast bulk of the star to a mere pin-point of light, in which geometrical detail is visible. But the pin-point has a definite brightness, and this corresponds to the height of the top of the blanket.

Can anything be done to study the machine as it lies concealed under the blanket? Yes indeed, and astronomers, amateur and professional, have been doing it for many years. The motion of the top of the blanket (changes in the star's brightness) may be observed accurately and in great detail. Its timing perfectly regular, i.e., are the intervals between maxima all exactly equal? Does the rise occupy the same time as the fall? Is the motion smooth or irregular? Is the fall similar to that of a body falling freely under the ac-

tion of gravity? (You, dear reader, may supply the stellar analogy to that one.) Does the hump look the same at all times? The blanket may have a slightly different texture when it is highest, indicating perhaps that it is stretched by the rise of the piston. The color of the star may be a little different at maximum indicating a change in the effective temperature.

We might use these methods as a game to test one another's ingenuity, but after all if we really wanted to understand the machine we would remove the blanket—if we could. What about the star's blanket? Is it removable? Well, not exactly, but by making spectroscopic observations, in which the complicated details of the light are revealed as individuals, we can at least tear some holes in the blanket and get glimpses of what is going on inside. What do we see? Gears going around, signal lights flashing, but no printed cards explaining in words of one syllable the relationship of the various parts. Nature doesn't do things that way. She disdains any language except her own, and at times we find difficulty in translating it. But if we pay close enough attention, it is not a hopeless task to gather at least a part of the meaning.

Just before maximum a blast of hot hydrogen roars out, a bit later some incandescent iron appears, while as the piston falls, a magnesium flare is touched off. What do these fireworks have to do with the rise and fall of the stellar piston? Maybe some day soon physical science can tell us.

Carnegie Institution of Washington,  
Mount Wilson Observatory.

## Twenty-Sixth Annual Meeting of the American Association of Variable Star Observers

D W. ROSEBRUGH

"The best ever," summarizes the 48 hours of social and scientific pleasures enjoyed by the 70-odd members who attended this convention at Harvard College Observatory.

The reason is not far to seek. It was because the amateur members of the association came forward in goodly num-

bers with paper, comments and discussion and made the convention more truly their own than has sometimes been the case. Keep up the good work everybody, at further meetings! The world has about emerged from the after effects of the world war and its malign offspring, the depression, and the AAVSO

must achieve new heights of observational effort, financial success, membership and especially enthusiasm during the fertile years ahead. This growth in enthusiasm must come from the amateurs. The professionals such as our beloved recorder, Mr. Campbell, our motivating geniuses, ex-president Dr. Shapley, and past and present officials Dr. Ernest Brown, Dr. Chas. P. Olivier, Dr. Annie Cannon, Dr. Alice Farnsworth and Dr. Helen S. Hogg are always back of us to provide constructive ideas, but the observations, organization work and new membership must be supplied by us amateurs.

There is plenty of hard work and corresponding honor waiting in the years ahead for the younger members and we must gird our loins for the fray. At the meeting it was all too evident that the active membership of the AAVSO consists of the "Young Grenadiers" of ages 20 to 40 and the "Old Guard" and that a wide gap in age of some 15 or 20 year separated the two groups. As Dr. Dorothy Davis, late Lick and now of Vassar College, pointed out, Deems Taylor announced last winter in one of the New York Philharmonic broadcasts that this condition is common to musical composers and no doubt to other creative, constructive and specialized groups whose work depends upon a fair degree of prosperity and leisure, for the war and its aftermath destroyed many who would now be our leaders and turned the attention of others to different fields. These lost leaders would now be about 45 or 50 and would be entering upon the prime of their experience and powers. But alas, having lost, or in fact, never having had these leaders, the AAVSO "Young Grenadiers" must train themselves to take over the work of the "Old Guard" as time goes on.

It was particularly gratifying to see so many capable young grenadiers attending this last meeting including Armfield, Halbach, Seely, Martz, Hamilton, Walter Scott Houston, Kirkpatrick, Peck, Russell, Seauvegeau, Carpenter and Linke to name but a few, although we missed such standbys as Hartmann, Webb, Christman, Scanlon, Doolittle and Louise Ballhausen. The brightest of futures is assured the AAVSO with talent like this rapidly developing in its ranks.

To reproduce the activities of 48 hours in two or three pages is impossible so that only happenings of most immediate interest to amateurs will be given here. Some of the occurrences which are deliberately omitted are perhaps of more general importance than those included and they will no doubt be reported in

Variable Comments and Popular Astronomy.

The clan began to gather on Friday Oct. 15 and by the time of the council meeting the Pickering Memorial Room was filled with new and old friends such as Dr. Shapley, Miss Swartz, Waldo S. Reed, Mrs. Hamilton, Richard Hamilton, Witherell, Jones, Armfield, Dr. Brown, Andrews, Miss Davis, Scott Houston, Dr. Holt and Mr. and Mrs. Kearons, who were all busily engaged in getting the latest news and the "dope" on this or that new gadget.

At 8 p.m. the Bond Astronomical Club acted as host to the AAVSO in the Library of the Observatory. The hall was comfortably filled with 200 eager listeners who had gathered to hear Dr. Charles A. Smiley of Brown. Dr. Smiley gave a delightfully humorous talk on his trip to Peru to photograph the last eclipse with an F.1 Schmidt camera. He underwent many experiences, some comic, some tragic, in reaching his destination, but his fine 60-second exposures which it is believed show the inner portion of the Zodiacal light as well as the over-exposed corona, well repaid the trouble. During the lecture, Chas. W. Elmer, our popular secretary, slipped in unnoticed and received a warm welcome from the members of the AAVSO at the end. A social hour followed during which the members of the two organizations had an opportunity to become better acquainted.

The morning of Oct. 16 dawned bright and clear, a typical AAVSO convention day, and by 9 o'clock many members had gathered to chat and look over the very fine library of 600 volumes donated to the association by Mrs. Yalden, in memory of our former president, the late J. Ernest G. Yalden.

The first formal meeting of the convention started at 10 a.m. and Percy W. Witherell, our able treasurer, reported that the association was in sound financial position but pointed out that under the gentlemen's agreement with Harvard for the publication of the observations made by the members of the AAVSO, the association should plan to contribute more to this expense than it has been able to do lately.

Dr. Dirk Brouwer of Yale, chairman of the occultation committee, presented a fine annual report but Dr. Brown, speaking for Dr. Brouwer, announced that professional duties prevented Dr. Brouwer from continuing this work except in an advisory capacity. Dr. Brouwer's resignation was accepted with regret by the association but the members were gladdened by the news that our good friend Dr. Ann S. Young, Profes-

sor Emeritus of Astronomy at Mt. Holyoke, will assume the chairmanship of this important committee on her return from California. In commenting upon the work of the occultation committee, Dr. Brown prophesied that the rate of rotation of the earth would soon alter for its cumulative change in rotation period has now surpassed all previously known maxima so that it is to be expected that a change in rate will soon occur.

Luverne Armfield, first vice-president, presented the report of the nova search committee. To date no one has discovered either a nova or a comet but he emphasized the possible value to science of even these negative results.

Ferdinand Hartmann's report as chart curator was read in his absence and indicated a healthy state of activity in the observing branch.

The Pickering Memorial astronomer, Leon Campbell, recorder of the AAVSO, then presented his interesting Sixth Annual Report. The Library has been greatly enriched by gifts from the Yaldeen and Olcott estates and from David B. Pickering and Mr. Brockmeyer of Fredonia, Kentucky. The Olcott 5-inch refractor is to be loaned to our active and capable member, Noah W. McLeod of Christine, N. D. Bound copies of Vols. 1 and 2 of Variable Comments are available at low cost. For those that wish data on variable stars and past meetings these are an excellent investment. Prof. Campbell stated that 1500 light curves of variable stars have been drawn up in preparation for a study which will soon be made regarding possible changes in the amplitude of variations of variable stars. The photographic survey work under the direction of Lynn H. Matthias was reported to be progressing smoothly. During the year upwards of 53,000 observations upon variable stars were made by 166 members so that the total observations made by AAVSO members during its 26 years now exceed 600,000. As usual Mr. Jones was first with 4275 observations and Mr. Hartmann second with 3134. Mr. Loretta, our Italian ace, finished third with 2949 observations. The members learned with regret of the resignation of Mrs. Helen L. Thomas as Prof. Campbell's assistant but were glad to meet Mr. Robert Loevinger of Minnesota who has taken over her work.

When Prof. Campbell had finished his report, Dr. Shapley appointed Mr. Barns and Mr. Allen as tellers for the annual election and they soon returned announcing the re-election of councillors Armfield and Olivier and the election of Mrs. Phoebe W. Haas and D. W. Rosebrugh

to the council. At the council meeting which followed, the new officers for 1937-38 were elected. These are, president, C. W. Elmer; first vice-president, L. E. Armfield; second vice-president, Dr. Helen S. Hogg; secretary, D. W. Rosebrugh; treasurer, P. W. Witherell, and last but not least, recorder, Prof. Leon Campbell.

At 12:30 the members were the luncheon guests of Dr. and Mrs. Shapley who entertained in their customary hospitable manner. This luncheon, as always, furnished one of the best opportunities of the whole convention to talk with old friends, and to form new. The Gaposkins were seen deep in serious talk with Miss Davis, no doubt discussing "Magnesium Hydride in Antares." The Menzels were ubiquitous and Mrs. Leon Campbell and her daughter, Mrs. Thomas and "Becky" Jones were always ready to chat between their duties of serving and pouring.

After luncheon the association congregated in front of the Shapley residence, where amidst the whizzing of movie cameras and the clicking of candid cameras the group photograph was taken by the Rev. W. M. Kearons of Fall River. His long experience in photographing sun spots no doubt stood him in good stead and the results are sure to be good.

At 2 p.m. the members convened for the final formal session and many papers of interest were presented. Those of Dr. Alice Farnsworth, Roy A. Seely and possibly the writer are being reserved for more complete comments in later articles in AA.

George P. Kirkpatrick discussed the present sunspot activity and derived a relation between the size of the umbra and penumbra which indicated that the umbra usually formed first but that after it reaches 1500 miles in diameter the penumbra begins to form and soon becomes much the larger.

A paper by Miss Dorritt Hoffleit on Zwicky's super-nova in N.G.C. 1003 was read by Leland E. Cunningham.

Prof. Campbell read a paper on the photography of red variable stars by Messrs. Woods and Watson of Baltimore. The results obtained appear to be in substantial agreement with those obtained by the visual observers with the red color filters and R type charts supplied by the association so that the visual observers felt encouraged to believe that their results in this difficult work are reliable.

Mr. Halbach then gave an illustrated talk on the new observatory of the Milwaukee Astronomical Society designed to house a 13-inch telescope. He said that

this observatory would not cost more than \$300, but as it appeared from his talk that almost all the material and most of the labor have been donated this figure was rather reminiscent of the two London street merchants who sold whisk brooms. Said one "I steal the bristles and I steals the handles and I don't make nothink selling them for sixpence. How do you make money selling them for threepence?" Said the other "I steals them ready made."

At this point several of the members began discussing the recent brilliant aurora of Oct. 7 which was apparently seen at Milwaukee, New York, Nantucket, and Poughkeepsie.

The members applauded loudly when Dr. Shapley announced that the association's Merit Award had been given to Eugene H. Jones of Goffstown, N. H. Mr. Jones has 34,000 observations to his credit and is still going strong, in fact stronger than any one else. In his speech of acceptance "Jonesy" contrasted his present superb observing conditions in the mountains with a 6-inch refractor with those he had to contend with in his little yard in Sommerville before he retired.

In the final paper Prof. Campbell showed that the AAVSO unadjusted observations on U Cygni had proved to be very nearly the same as the adjusted figures of the British Astronomical Society observers. He doubted the necessity for elaborate adjustments of observations to allow for the individual peculiarities of observers' eyes.

At the close of the scientific session a rising vote of thanks to Dr. Shapley was given in appreciation of his inspiring leadership of the AAVSO as president during the last two years.

But the crowning festivity of the meeting, the annual dinner awaits us. Some 70 or 80 members, with their friends, wives and sweethearts, sat down at 7:30 to an excellent chicken dinner a la Harvard Faculty Club and relaxed comfortably in their chairs at the end to listen to the excellent speaker. Among the guests at this dinner were Miss Margaret Harwood of Nantucket, Miss Marjorie Williams of Smith, and Dr. and Mrs. T. E. Sterne and Miss Florence Cushman of the Harvard Observatory staff. Miss Cushman was presented with a corsage by the association on the occasion of her retirement after keeping the ten-day ledgers for many years for the AAVSO.

Dr. Lindsey, formerly of Harvard and now Director of Armagh Observatory as successor to the late patron saint of telescope makers, The Rev. W. F. A.

Ellison, gave an illustrated talk on the Harvard Observatory at Bloemfontein, South Africa. He pointed out that the 61-inch reflector there is the largest telescope in the southern hemisphere and that the observatory is a twin of that at Oak Ridge.

W. B. Stearns reported on his mission to the 50th anniversary of the founding of the French Astronomical Society to which he carried the greetings of the AAVSO and the AAS.

Dr. Shapley, who acted as toastmaster, interspersed the talks of other speakers with rapid fire inventory of the latest scientific discoveries.

Ed Martz Jr. of planetary fame described the superb atmospheric conditions he encountered when observing with Prof. Pickering in Jamaica and Prof. Campbell ably summed up the high lights of the meeting.

At 10 p.m., as if by appointment, Dr. Shapley formally turned over his responsibilities as president to Chas. W. Elmer, our new president, who accepted his duties in a witty speech and declared the meeting adjourned until next spring at Brown University, Providence, R. I.

Oh yes, just as a postscript, on Sunday morning a dozen or two of late lingerers visited the Oak Ridge Observatory of Harvard under Prof. Campbell's guidance. Those who made this trip included Seely, Andrews, Prinslow, Russell, Martz, Halbach, Hamilton, Peck, Hedengren, Linke, Carpenter, Aller, Dr. Dorothy Davis, Mrs. de la Ruelle, and Mrs. Rosebrugh. We all regretted that a severe cold kept Luverne Armfield in his bed at the hotel in Cambridge, but his mother, Mrs. Armfield, acted as his deputy.

Dr. Dimitroff displayed and explained all the instruments very fully, from the largest with its new 61-inch Pyrex mirror to the smallest, a 1-inch refractor of 6½-inch focal length, in other words a meteor patrol camera with a shutter which flicks twenty times a second to determine meteor speeds. This instrument is operated in synchronism with a similar one at Harvard and the center lines of the two cameras are set to intersect 60 miles in the air. Dr. Don Leet, one of the foremost experts on earthquakes in the country, demonstrated the Harvard seismograph to an interested group and about noon with regretful adieus the last survivors of the 26th Meeting disbanded, some returning east to Boston and others driving west.

3 Yates Boulevard,  
Poughkeepsie, N. Y.

## Globular Solar Corona

The Harvard University news office recently released the following information which was obtained through photographs made by an amateur during the eclipse of last June 8:

"The first definitive proof that the solar corona is not made up chiefly of flaming coronal streamers alone, as has been supposed, but is an even, globular blanket covering the sun more than a million miles deep, was revealed today by a conference of astronomers at Harvard Observatory."

Photographs leading to this finding were taken from an airplane in the sub-stratosphere off the coast of Peru during the eclipse of last June 8, under the direction of Major Albert W. Stevens, U. S. A., famous stratosphere explorer and member of the Hayden Planetarium-Grace eclipse expedition.

All of Major Stevens' plates clearly show a perfectly even corona surrounding the sun, at a depth considerably greater than the diameter of the body. His photographs include 11 pictures with a 24-inch camera, four pictures with an 8¼-inch camera, and 150 feet of motion picture film made with a 6-inch lens.

The usual familiar coronal streamers, which have completely dominated eclipse photographs taken from the ground, and which have absorbed most of the scientific attention up to now, appear on the new plates as relatively insignificant bright tracery in the immense globular envelope.

While the great altitude of 25,000 feet at which Major Stevens worked, made his observation very difficult from the point of physical discomfort, it was largely because of this height that he made his finding, according to Dr. Harlow Shapley, of the Harvard Observatory. In the stratosphere he had the advantage of being above about two-thirds of the earth's atmosphere, where dust particles and air molecules give relatively small trouble in photographing difficult subjects like the solar corona.

"It is probable that the finding will affect the traditional method of eclipse observations, leading astronomers to make more use of airplanes to carry their instruments up into the stratosphere. Further analysis of the structure of the globular corona must wait until the next favorable eclipse in 1940 over South America and South Africa, when scientists can study the phenomenon through ultra-violet lens systems and the spectroscope.

"Dr. Donald H. Menzel, Harvard's authority on solar phenomena, and leader of the Harvard-M. I. T. eclipse expedition to Siberia last year, voiced the belief of the conference that Major Stevens' finding 'of great importance and will have an immediate bearing on the interpretation of the structure of the sun's upper atmosphere.'

"Guided by their new knowledge of the globular corona, the astronomers checked back and found that the phenomenon was recorded on the Harvard totality photographs of last year, although by no means as clearly as on the stratosphere photographs. Earlier indications of the globular form of the corona had been obtained by the European astronomers Bergstrand and von Klueber, but the full appreciation of the nature of the corona was not reached until Major Stevens' photographs brought out the phenomenon more clearly than heretofore.

"A possibility that the spectacular coronal appearance on Major Stevens' plates was caused by photographic or optical defects or by the action of minute ice particles in the stratosphere has been ruled out by rigid tests at the Eastman Kodak company, and the Institute of Optics of the University of Rochester, N. Y.

"Reports of examinations of the Stevens' negatives were presented to the Harvard conference by Dr. Kenneth Mees and Dr. Walter Clark, of the Eastman laboratories, and by Dr. Brian O'Brien, of the Institute of Optics, a summer lecturer at Harvard. Their experiments were accepted as conclusive that Major Stevens had photographed a natural phenomenon. The astronomers considering the evidence numbered fifty scientists from a dozen different American observatories.

"Harvard scientists commented today on the fact that two of the most significant observations of the 1937 eclipse were the work of amateur astronomers. Their reference was to Major Stevens, who is one of the Army's best known experts in stratosphere flight and aerial photography; and to Sr. Fernando de Romano, a Peruvian amateur astronomer, who utilized Harvard equipment in June to obtain the best photographs of the corona ever made in polarized light.

"As a highlight of today's scientific announcement, the astronomers pointed out that Major Stevens' important results were unexpected and essentially accidental. As one of the many field

*(continued on page 150)*

## Amateurs and Solar Photography

MAUDE S. WIEGEL, Solar Director

The increase in sunspot numbers, the immensity of some of the spots, and the recent eclipse, all tend to awaken an interest in solar observing and photography. Some very fine photos of the sun have come in. From Buenos Aires, Carlos Segers, using a 4-inch refractor, a yellow filter, a compur shutter—the objective diaphragmed down—and an exposure of one hundredth of a second, has succeeded in making some beautiful photographs, the solar equatorial zone easily traceable by its bordering trails of spots both large and small. The spots are well defined even to the smallest. A recent photograph shows a solar quadrant with a pair of spots immense in size, the umbra deep black and shadow defined, and the penumbra fully as wide as the spot itself. The spots were accompanied by twisted trails of dark faculae showing clearly the swirling motion of the gases surrounding the vortex. Close by, a group of smaller spots formed a distinct S-shaped stream resembling the arms of a nebula.

From E. A. Halbach comes a series of negatives of splendid solar images (about 2-inch dia., well timed and free of blemishes (quite an accomplishment.) These images show fine definition of the spots both large and small, right up to the sun's limb. The mottled solar atmosphere is plainly discernable as is also the faculae near the edge. Mr. Halbach is using a 5-inch refractor, having added an extension tube after discarding the ocular and substituting a camera complete with lenses and a red filter. These photos are splendid examples of what an amateur can do. Mr. Halbach can be very proud of his work.

In Canada, Mr. Topham, another amateur with a growing interest in solar research, began to use his 4-inch refractor under the handicap of cramped quarters. Mr. Topham is building a new home which will be accompanied by a fine observatory, much larger than his present one, where there will be ample space for a dark-room. The solar section awaits developments from Canada.

Details of equipment used by these amateurs will be furnished to those interested.

Twin Elms Solar Observatory,  
Elizabeth, Pa.

### The official monthly publication of the American Amateur Astronomical Association

Publication Headquarters  
1312 E. Curtis Place, Milwaukee, Wis.

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Ten cents per copy, \$1.00 per year.

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

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## Calendar of Events

GEORGE DIEDRICH

(All times C.S.T.)

### NOVEMBER, 1937

- 11 Thu.—First quarter at 3:33 A.M.  
14-17 Leonid meteor shower. Maximum on the 15th (AMS shower).  
18 Thu.—Full moon at 2:10 A.M.  
Partial eclipse of the moon; moon enters umbra 1:37 A.M.; middle of eclipse 2:19 A.M.; moon leaves umbra 3:00 A.M.  
24 Wed.—Last quarter at 6:04 P.M.  
25-28 31 Leo Minorid meteors.  
27 Sat.—Delta Perseid meteors.

### DECEMBER, 1937

- 1 Wed.—Conjunction of Venus and the moon at 8:03 A.M. Venus 2° 14' north.  
2 Thu.—New moon at 5:11 P.M.  
Annular eclipse of the sun (not visible east of 100° W. longitude in U.S.A.).  
7-8 Theta Geminid meteors.  
9-13 Geminid meteor shower. Maximum on the 12th (AMS shower).  
10 Fri.—First quarter at 7:12 P.M.  
12 Sun.—Mercury at greatest elongation east (20° 38').  
13 Mon.—First quarter at 8:28 P.M.  
20 Mon.—Quadrature of Saturn and the sun.

## Milwaukee News Notes

M. N. FISHER, Correspondent

A vivid description of the total eclipse of the sun was brought to members of the Milwaukee Astronomical society at its meeting Oct. 21 at the University of Wisconsin extension division by Dr. Ethelwynn R. Beckwith who went to Peru to see the longest eclipse in 12 centuries—seven minutes and four seconds. Prof. Beckwith teaches mathematics and astronomy at Milwaukee-Downer college.

There was fog on the Peruvian coast and dire tidings of mountain disease and sleet storms away from the coast when Prof. Beckwith and Dr. and Mrs. Joel Stebbins, of the University of Wisconsin, and Maj. Albert Stevens, of the army, arrived at Lima last May 21. Several other expeditions promptly established bases on the coast; Dr. Stebbins went into the mountains.

The weather news was as discouraging as it could possibly be the day before the eclipse. Snow. Sleet. Fog. Heavy clouds. No wind.

Prof. Beckwith decided to take a chance on the mountains.

The great day—almost the very hour—arrived with the clouds still obscuring the sky. Then, as if on command, the clouds rolled away just in time. Slowly the moon passed across the sun's disk and at length the beautiful corona burst out—a glowing halo around a black moon.

The eclipse itself began on June 9 and ended on June 8 because it happened to cross the international date line, Prof. Beckwith said. The path of the eclipse was one-third the circumference of the globe and only 250 miles of it lay over land. The first photograph of an eclipse, she said, was a daguerreotype and the last—typified by those Maj. Stevens took from a plane 25,000 feet in the air—may revise entirely all present belief about the corona.

At this meeting also Herbert W. Cornell read a paper written by James Stokley on his experience in viewing the eclipse from the deck of a freighter eastward bound in the path of the eclipse. Both speakers showed photographs made at the time.

Milwaukee and Chicago were well represented at the AAVSO meeting Oct. 15 and 16 at the Harvard College Observatory. The group went in three cars and included E. P. Martz, jr. and Walter Linke of Chicago; Verne Armfield and his mother; Mrs. Adeline de la Ruelle, C. M. Prinslow, T. R. Hedengren, A. L. Peck, Scott Houston and the society's president, E. A. Halbach.

The structural steel dome, which will house the Milwaukee society's telescope, will be covered with sheet iron before cold weather sets in. Work has been going forward rapidly each week-end at the observatory site several miles southwest of Milwaukee. The road to the observatory has been marked with "Follow the Stars" signs and, in general, the spirits of the Milwaukee members have risen with the building of the observatory. R. D. Cooke has been appointed to supervise the construction work  
817 N. 28th Street  
Milwaukee, Wis.

## Chicago News

H. C. TORREYSON, Secretary

The regular meeting of the Chicago Amateur Astronomical Association was held in Adler Planetarium on Oct. 3. Dr. Philip Fox, director of the Planetarium, was the principal speaker. His subject was "Sundials". The making of sundials by ruler and compass construction and by the trigonometric method was explained. Several types of dials were exhibited and many others of the Planetarium collection were referred to.

The topic of G. E. McCord's educational talk was "Northern Lights". Several unusual displays of the aurora were described.

C. R. Schmidgall, who was the principal speaker at the meeting Oct. 31, told about an unusual discovery that he has made regarding planetary and lunar observations.

The Association is planning a program of photographic sky patrolling which has been the chief topic of discussion whenever local telescope nuts get together. This plan requires the cooperation of instruments makers and photographers. A Schmidt camera of about f:1 is to be figured and both spherical mirror and correcting plate divided into six cameras of higher focal ratio. The center section will be eliminated leaving the focal surface outside of the cylinder, of which the mirror and correcting plate are a part. Work will start on the cameras as soon as various members will contract to do the work.

3738 N. Richmond St.,  
Chicago, Ill.

## Globular Solar Corona

(continued from page 147)

workers in the Hayden Planetarium-Grace expedition, directed by Dr. Clyde Fisher, of the Hayden Planetarium, Major Stevens was primarily interested in getting high enough to photograph the spectacular course of the moon's shadow as it raced along the earth and cloud tops."

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## Eugene H. Jones

By D. W. ROSEBRUGH

One of the most deservedly popular and honored amateur astronomers in the country is Eugene H. Jones of Goffstown, N. H. At the meeting of the American Association of Variable Star Observers, held Oct. 16, 1937, at Harvard College Observatory, he was the fourth person to be presented with the Merit Award given by the AAVSO; the three previous recipients have been Leslie C. Peltier, Delphos, Ohio, the Rev. T. C. H. Bouton of St. Petersburg, Fla., and the late revered secretary of the AAVSO, William Tyler Olcott. It is certainly fitting that Mr. Jones, who joined the Association in 1922 on the invitation of Mr. Olcott, should follow his great preceptor in obtaining this reward, and no one would have been more pleased than Mr. Olcott if he had been able to be with us when it was awarded.

During the last 15 years "Jonesey" has made 34,000 observations and established what must be an all time high yearly mark of 4,275 observations this last 12 month. His greatest thrill was when he located his first variable star field, that of R Cygni, back in 1922, but he was much puzzled for R Cygni itself was missing. Later he discovered that it was because it was below the four-

teenth magnitude at that time and quite out of reach of his 3-inch refractor. Now, however, Mr. Jones uses a 6-inch Clark refractor and is a past master at the art of observing. His telescope is permanently mounted and he locates the stars by circle. For preference he uses a 2-inch Mogeypiece with the 6-inch refractor and the 2-inch finder for brighter stars. However, he uses a higher power eyepiece for faint stars and occasionally his 10X binoculars for bright stars.

Mr. Jones is one of the "Old Guard" of the AAVSO, and he was well acquainted with the late Mr. McAtteer, who started the AAVSO library, Dr. Harriet Bigelow, who was president prior to her death, and the late Dr. Charles C. Godfrey.

Mr. Jones was a councillor of the AAVSO from 1933 to 1936 inclusive.

In 1888 before many of us amateur astronomers were born, Mr. Jones started working for the Edison Electric Co. in Somerville, Mass. At that time he had 60 street lamps to look after, but when he retired in 1929 there were 3500 under his supervision. The gold button set with a diamond and two sapphires which he wears indicates that he worked for the electric company for 41 years and 70 days, a record of which anyone could be proud.

When Mr. Jones retired in 1929, he and Mrs. Jones moved to Goffstown, one suspects, to be nearer his beloved stars, for Mr. Jones was born in Cambridge and lived in Somerville from the time he was 10 years old. Occasionally when AAVSO spring meetings tempt them away from Goffstown, Mr. and Mrs. Jones drop in to see their married daughter Mildred in Bethesda, Md., and their son Richard Jones in Nutley, N. J., but otherwise Mr. Jones sticks close to his observatory, and to his other hobby of landscape painting which he learned from a pupil of the great French painter, Jerome of Paris.

Great honors like the Merit Award of the AAVSO come but once in a lifetime, but we all hope to be able to congratulate Mr. Jones on his 68,000th observation 15 years hence.

3 Yates Blvd.,  
Poughkeepsie, N. Y.



## Variable Star Section

D. W. ROSEBRUGH, Director

### WORLD'S VIEW

The writer is spending his all too brief vacation at his father's summer camp on the Georgian Bay, Lake Huron. Each day he climbs the watch tower on the rocks back of the cottage, sets up his portable 3-inch telescope and surveys the world. In the foreground are a few dozen of the 30,000 islands in the Georgian Bay. Among the score of summer camps which may be glimpsed through the trees is that of Dr. C. A. Chant, director emeritus and organizer of the new David Dunlap Observatory of Toronto Observatory with its magnificent 74-inch reflector. Somewhat farther away is the cottage of the late Prof. McCurdy, whose son-in-law is Prof. Henry Norris Russell of Princeton. To the east and north is an impenetrable forest, save where rivers flow and Indian trails traverse it; it stretches away towards the home of the aurora. To the west lie the blue waters of the mighty Georgian Bay and along the horizon an archipelago of majestic islands is silhouetted. To the eye they are mere blue bulks, like playful sea monsters chasing each other into the sunset, but the telescope shows an occasional lighthouse and fisherman's hut.

On one of these fair, far islands known as Giant's Tomb, the Ojibway Indians believe that Nanahbozhoo is buried. This mythical semi-deity is akin to Prometheus and Hiawatha, for he showed the Indians how to make fire. On Christian Island, beyond Giant's Tomb, the remnants of the once proud nation of Ojibways live on their reservation. To the right of Christian Island where "cloud and shadow meet and mingle far, far to westward" one can just discern the bellbuoy on Lottie Wolf Shoal, some 20 miles away. Variable star observing renders the eyesight keen, for the writer can see this buoy, though those with better eyesight but less telescopic experience cannot. In his undergraduate days he sailed past the buoy with some of his friends, now alas greying at the temples like himself, and heard it give one dismal clang as it rocked disconsolately on a glassy swell. Seemingly the only object more isolated than a buoy is a star.

Would that the clear evening atmosphere of the Georgian Bay could be transported to the backyard of each variable star observer. It was here that the writer first knew and loved the stars. In this pellucid night atmosphere the

stars seem to press close, to really live and to be personal friends. From the watch tower one can almost hear the Milky Way trickle as it seems to flow down into the great star clouds of Sagittarius. Certain unknowing city dwellers have asked the writer why he observes variable stars. Let them come into the wilderness where they can really see the night sky, and they too will take up astoronomy, not because they hope to help unravel the secrets of the evolution of stars and the cosmos, but because a great longing will drive them forth from their comfortable firesides to let the beauty of the stars sink deep into their souls.

Each night 213843, SS Cygni passes just south of the zenith for we are exactly on the forty-fifth parallel. In continuance of our series of descriptions of individual variable stars this article and the next will be devoted to describing it.

As with people, so with stars, personality not pulchritude spells popularity. SS Cygni has personality plus and it is the most popular variable star in the heavens. Among others two fascinating pamphlets have been written on this star, namely the "Light Curve of SS Cygni," by Prof. Leon Campbell, our beloved recorder of the AAVSO and "Properties of the Light Curve of SS Cygni" by Dr. T. E. Sterne and Prof. Campbell. This article and our next will briefly summarize these two stimulating works.

The variability of SS Cygni was discovered in 1896 by Miss L. D. Wells. About 78 per cent of the time the star varies gently about the 11.9 magnitude. Every 50.48 days on the average the star suddenly rises in brightness to about the 8.6 magnitude on the average, remains there for a few days and then returns somewhat more gradually to its accustomed 11.9 magnitude, where it remains until its next outburst. Incomprehensible as such behavior is, the star might soon lose its popularity if it followed this routine with unailing regularity, but it does not. The periods between maxima vary on occasion between 20 days and 105 days. The brightness of the maxima vary between 10 and 8.1 magnitude and the lengths of time that the star remains at maximum vary from 1 day to 20 or more.

As this brief outline makes clear and as anyone who has watched the star

for a year or two knows, the star is temperamental and is always doing the unexpected. This fact alone might not make the star the interesting study that it is, but what really intrigues the fancy is the fact that out of this welter of irregular fluctuations, which is shown clearly by the 60,000 observations which have been made upon its brightness, some semblance of law and order seems to be peeping through.

In their studies Prof. Campbell and Dr. Sterne have attempted to discover the statistical laws which SS Cygni seems to follow.

The star's minimum brightness of about 11.9 or thereabouts is a base from which the star departs rapidly and irregularly, but to which it soon returns after each maximum. As might be expected therefore the maxima seem to be more important in statistical studies than the minima.

Four distinct types of maxima or uprushes have been recognized. These are termed A, B, C and D types, and each of these has been subdivided. Type A maxima are those where the star brightens rapidly in about two days and rises more often than not to a considerable brilliancy, say 8.3 magnitude. Sometimes the star stays bright for only a day or two and such a maximum is called A1 or A2. A maximum which lasts five days or thereabouts is termed A5 while maxima which last 8, 9, 10, 11 or 12 days are referred to as A6, A7, A8, A9 or A10 respectively. Type B maxima are similar to A type maxima but the rise may take four days instead of two and the star may not become

quite so bright, perhaps only reaching the ninth magnitude on occasion. Types B1 and B2 are narrow maxima lasting from three to five days while B3 and B4 last about 10 days. When the star undergoes type C maxima it is still slower in brightening up, perhaps taking six days, and in some cases the star only reaches the 9.6 magnitude. Type D maxima are more irregular, sometimes the star takes two weeks to reach maximum and occasionally only the tenth magnitude is reached. Types C and D maxima are sometimes referred to as "anomalous" or formless, but it is now believed that they are well defined types of maxima that occasionally occur.

Whatever the type of maximum however the declines to minimum after a maximum are much alike so that the statement may be made that the star's peculiarity lies principally in the different ways in which it rises to brightness.

Next month we will conclude our discussion of this star.

Now that the summer vacation season is over it is hoped that observers will commence contributing comments as to the phenomena which they have observed. Only a few of us have time to look at more than a fraction of the stars on the AAVSO list so that comments upon what the stars are doing will be interesting to other observers who may not be following the same stars.

We appreciate the receipt of a card from Franklin W. Smith, Vineland, N. J., reporting observations in the old way.

3 Yates Blvd.,  
Poughkeepsie, N. Y.

## Planetary Report No. 25

E. P. MARTZ, JR. Planetary Section Director

### Mars 1937—IV

The Atmosphere:—The monochromatic photographs and visual color filter observations and drawings of Mars described and discussed in the last three of these planetary reports indicate the existence, during the apparition of this year, of at least three distinct types of obscuring clouds and haze in the atmosphere of the planet:

1. Bright spots and areas reflecting blue and green light (3700-5200 A.U.), existing principally around both north and south polar regions, but also occasionally appearing in the temperate and equatorial zones. These phenomena totally obscured the surface markings which they overlay, but were transparent to red and yellow light.

2. Dark obscuring areas reflecting

little or no light in blue or green, but transparent to red and yellow light. The greatest obscuration of surface markings due to this type of atmospheric phenomenon appears to lie in the region between 4800 A.U. and 5200 A.U. There is some indication that these areas appear brighter in red and yellow light, indicating some reflection of those wavelengths.

3. Atmospheric haze of varying and differential obscuring properties. When present this haze is difficult to penetrate with yellow and even red light, and reflects blue light (3700-4800 A.U.). When it is not present, even photographs by blue-violet light often show recognizable surface markings.

Phenomena of type 1 have been photo-

graphed by Pickering, Slipher, Wright, Ross and the writer since as early as 1888, and observed by a number of visual methods. They are coincident with "Type I" suggested by Wright in 1931. (*Lick Observatory Bulletin No. 589 p. 54*). My type 2 above seems not to have been much remarked by others, but it appears to be identical with "Type II" of Wright. (*Ibid.*) Phenomena of type 3 above were apparently photographed by W. H. Pickering in blue light as far back as 1888-1890 (*Harvard Observatory Annals*, Vol. LIII, No. VIII, and *Popular Astronomy* 33, 439, 1925. "Report on Mars No. 30". W. H. Wright and E. C. Slipher have photographed them since 1920 (Wright, *Ibid.*, and *L.O.B.* No. 366, and numerous short papers in *Popular Astronomy* and *Publications of the Astronomical Society of the Pacific*). Also see Ross, *Astrophysical Journal*, 64, 243, 1926). Visual observers have often blamed temporary obscuration of surface markings by type 3 phenomena on actual abnormal seasonal surface changes on the planet. This apparition has been exceedingly unusual in that the haze of type 3 has several times suddenly disappeared for an interval of several days allowing surface detail to be photographed with blue-violet light (E. C. Slipher, *Publ. Astr. Soc. Pacific*, 49, 137, June 1937). W. H. Pickering observed, but did not particularly remark on, similar unusual blue-violet photographic results in 1888-1890 (*Ibid.*). It will be interesting to check previous oppositions to determine if there is any cyclic character to this recurrence of unusual blue-violet atmospheric transparency at widely separated apparitions over a period of years.

It is evident that the existence of water vapors in the form of the various types of clouds and haze, such as we know in our terrestrial atmosphere, would probably explain the atmospheric phenomena described above. However, the modern spectroscopic evidence, which has been well corroborated several times by Adams and Dunham, and much of the visual evidence indicate that it is almost impossible for a sufficient amount of water vapor to exist in the Martian atmosphere to serve this purpose without our having detected it. We must, therefore, turn elsewhere for a suitable explanation. From a preliminary qualitative analysis, and conversations with Drs. Wright, Slipher, Ross, Menzel, Professor W. H. Pickering and Messrs. W. H. Haas, J. B. Edson and Walter Linke, it appears to me that there are at least three possible types of physical and chemical agencies which will explain the atmospheric phenomena described above:

1. Dust particles of varying sizes

suspended in the lower regions—troposphere—of the Martian atmosphere. Recent work on diffuse galactic nebulæ appears to indicate that such dust should give a faint, continuous absorption, principally in the blue end of the planetary spectrum. So far as I am aware, no work has yet been attempted on the Martian spectrum to determine if this is present.

2. An excess of large and heavy molecules such as carbon dioxide, scattering the incident light. This carbon dioxide, if present, should be evidenced by absorption bands in the red end of the spectrum. These have not yet been found for Mars, but as they are difficult of detection, they may exist, to be discovered in the future.

3. A scattering agent composed of molecules such as chlorine and fluorine gases, detectable by bands and continuous absorption in the blue end of the spectrum. It is doubtful if these bands can be detected, due to lack of sufficient sensitivity in our photographic plates and technique, but the possibility of such an agent still exists, and its presence may be investigated by other methods.

Intensely active gases such as fluorine could hardly be expected to exist freely in the Martian atmosphere, as they would soon unite with other atmospheric and surface substances. Since the work of Adams, Dunham and Abel has indicated so clearly the presence of carbon dioxide in the Venusian atmosphere, it seems that it should have been detected in the atmosphere of Mars if it were indeed present. This leaves us with the alternative of dust particles, or molecules such as chlorine gas. Since little is possible at present in the way of detection of the latter, we will first consider the hypothesis of a suspension of dust particles. Here we have three possible cases to examine:

1. Dust particles larger than the wavelength of the light incident on them which will reflect their own color, probably red, yellow or brown, if they have their origin from the undoubtedly sandy, dusty Martian surfaces.

2. Particles smaller than the wavelength of incident light, which will reflect blue light, due to scattering, in obedience with the Rayleigh Theory.

3. The intermediate case of a mixture of small and large particles or particles whose size is of the same order of magnitude as the wavelength of incident light, which will both absorb and reflect red and blue light.

This discussion will be continued in future planetary reports.

5559 University Avenue  
Chicago, Ill.

## AAVSO Nova Program Notes

L. E. ARMFIELD

### AAVSO Nova Program Committee's Annual Report for Year 1937

(Presented at the 26th Annual Meeting of the AAVSO, October 15, 1937)

The visual nova search program closes its second year as an organized activity of the AAVSO with a good record of productivity. While no one participating in the program has been rewarded with the discovery of a nova or comet, the committee feels reasonably sure that no objects brighter than the fifth magnitude have appeared in 16% of the sky area selected for the search. The value of the negative results obtained annually will become increasingly important from a statistical standpoint with the passage of the years.

Thanks to all participants, a marked improvement has been made over 1936 in the number of regions reviewed throughout the year. 68% or 117 of the 175 regions selected for the search have been assigned to 70 observers in 20 states, Canada and four foreign countries, namely, Greece, Italy, Japan and New Zealand. 100% of the regions in declination  $+80^\circ$  to  $-20^\circ$  have been assigned, and, in a majority of cases, to two or more observers remotely removed from each other in longitude. Only five regions in declination  $-20^\circ$  to  $-80^\circ$  have been assigned. It is obvious that this is a weak point in the program and every effort must be made to have the regions in the aforementioned belt assigned during the coming year.

48% of the observing members use binoculars or low powered finders in reviewing their regions thereby extending the survey down to the seventh and eighth magnitudes. Miss Ballhausen, Messrs. Friton, Hanna, Hewlett, 2, Inouye, Karl, Kirkpatrick, Loreta, McNabb, Moore, Northcott, Rosebrugh, Sharp, Swensson and Topham deserve much commendation for their efforts in extending the search to fainter magnitudes.

Special mention must be made of the excellent cooperation being given the program by members and friends of the Royal Astronomical Society of Canada under the able supervision of Dr. Helen S. Hogg and Miss F. Shirley Patterson of the David Dunlap Observatory. The program is indebted also to Hideo Inouye and S. Kaneko of Japan for their work in introducing the nova search program to Japanese amateur astronomers through the AMO (Amateur Meteor Observer), the official publication of the Amateur Meteor Observers of Japan. The committee extends its appreciation to the American Amateur Astronomical

Association for publishing nova program observations monthly in the pages of *Amateur Astronomy*.

While the percentage of the selected areas consistently reviewed has risen from an average of 5.6% during 1936 to an average of 16.4% during 1937, the latter percentage is still much too low. Consequently, the committee again appeals to all members and friends of the AAVSO and AAAA, and, particularly, to those residing in southern latitudes, for aid in this important field of endeavor.

Respectfully submitted,

D. W. ROSEBRUGH,

ROY A. SEELY,

L. E. ARMFIELD, Chairman.

\* \* \*

The nova program is happy to announce the use of a Schmidt camera by Arthur De Vany, 929 Grand Avenue-Davenport, Iowa, in the search for novae and comets. De Vany has a 7-inch F.O.7 camera whose plates cover about  $25^\circ$  of declination. So far as is known to the writer, Mr. De Vany is the first amateur to employ a Schmidt camera systematically in the search for novae and comets and thereby deserves much credit for his pioneering efforts. Mr. De Vany's procedure in this work is to center the camera on a chosen star, night after night, exposing the plate for approximately two minutes and taking it into the dark room immediately for development. In about ten minutes the plate is ready for examination by orienting it over a previously standardized plate of the region. While this may appear that we are trespassing on the property of the Photographic Section's camera patrol program, we have received Mr. Matthias' permission to describe and record such work as is devoted exclusively to the search for novae and comets in these notes until the time the photographic patrol is developed to the point where it consistently reviews the areas selected for the nova search.

We record with thanks the following nova search observations during the months of September and October.

Observer	Region	Location		Magnitude of faintest star easily visible							Total Nights	
				9	8	7	6	5	4	3		2
Abrahams	56	Milwaukee	(May)	....	....	2	....	1	....	....	....	3
			(May)	....	....	....	7	....	....	....	....	7
			(May)	....	....	....	2	1	....	....	....	3
			(June)	....	....	....	7	5	....	....	....	12
			(July)	....	....	1	....	....	....	....	....	1
			(July)	....	....	....	11	7	....	....	....	18
			(Aug.)	....	....	....	4	4	....	....	....	8
			(Aug.)	....	....	....	11	8	....	....	....	19
			(Aug.)	....	....	....	4	4	....	....	....	8
Ballhausen	57	Oxford, Miss.	(Sept.)	....	....	....	3	6	2	1	....	12
			(Sept.)	....	....	....	3	6	1	1	....	11
			(Sept.)	....	....	....	4	6	1	....	....	11
Cushman	33	Poughkeepsie	(Sept.)	....	....	....	2	3	2	....	....	7
			(Aug.)	....	....	....	....	2	1	....	....	3
De Vany	**	Davenport	(Sept.)	....	....	....	....	....	1	2	4	7
			(Oct.)	2	....	....	....	....	....	....	....	3
			(Oct.)	3	....	....	....	....	....	....	....	3
			(Oct.)	4	....	....	....	....	....	....	....	4
			(Oct.)	1	....	....	....	....	....	....	....	1
			(Oct.)	4	....	....	1	....	....	....	....	5
Diedrich	43	Milwaukee	(Oct.)	....	....	....	....	....	....	....	....	2
			(Sept.)	....	....	....	11	1	1	2	....	15
			(Oct.)	....	....	....	8	3	3	....	....	14
Friton	9	St. Louis	(Aug.)	....	....	3	16	1	....	....	....	20
			(Aug.)	....	....	3	16	1	....	....	....	20
Halbach	49	Milwaukee	(Sept.)	....	....	....	4	1	....	1	....	6
			(Sept.)	....	....	....	4	1	....	1	....	6
			(Sept.)	....	....	....	4	....	....	....	....	4
			(Sept.)	....	....	....	....	4	1	2	....	7
			(Oct.)	....	....	....	3	6	1	1	....	11
			(Oct.)	....	....	....	3	6	1	1	....	11
			(Oct.)	....	....	....	1	2	1	....	....	4
			(Oct.)	....	....	....	....	2	3	1	....	6
Hanna	62	New York	(Oct.)	....	....	....	3	....	....	....	....	3
			(Oct.)	....	....	....	2	1	....	....	....	3
Karl	13	Chicago	(Aug.)	....	1	2	13	1	....	....	....	17
			(Aug.)	....	1	2	13	1	....	....	....	17
			(Sept.)	....	4	6	5	2	1	....	....	18
			(Sept.)	....	4	6	5	2	1	....	....	18
Keuziah	40	Milwaukee	(Oct.)	....	....	....	....	13	....	....	....	13
			(Aug.)	....	....	....	27	....	....	....	....	27
Kirkpatrick Lewis	61	New York	(Sept.)	....	....	....	2	3	....	....	....	5
			(Oct.)	....	....	....	1	2	....	....	....	3
			(Oct.)	....	....	....	1	2	....	....	....	3
Loreta	46	Bologna, Italy	(Oct.)	....	....	....	1	2	....	....	....	3
			(Sept.)	....	....	....	4	3	....	....	....	7
			(Sept.)	....	....	....	....	1	....	....	....	1
			(Oct.)	....	....	....	1	2	....	....	....	3
McNabb, Jr.	112	Acton, Can.	(Oct.)	....	....	....	....	1	....	....	....	1
			(Sept.)	....	....	....	3	1	....	....	....	4
			(Sept.)	....	....	....	3	....	....	....	....	3
			(Sept.)	....	....	....	....	4	....	....	....	4
			(Sept.)	....	....	....	....	4	....	....	....	4
			(Sept.)	....	....	....	....	4	....	....	....	4
			(Oct.)	....	....	....	6	1	....	....	....	7
			(Oct.)	....	....	....	1	....	....	....	....	1
			(Oct.)	....	....	....	2	....	....	....	....	2
			(Oct.)	....	....	....	....	5	....	....	....	5
			(Oct.)	....	....	....	....	5	....	....	....	5
			(Oct.)	....	....	....	....	1	....	....	....	1

Observer	Region	Location		Magnitude of faintest star easily visible								Total Nights
				9	8	7	6	5	4	3	2	
Moore	26	Milwaukee	(Sept.)	....	....	....	3	8	5	....	....	16
	26		(Oct.)	....	....	....	4	10	4	....	....	18
Perkinson	34	Fresno, Cal.	(Oct.)	....	....	....	1	....	....	....	....	1
	1		Poughkeepsie	(Sept.)	....	....	7	4	2	1	....	....
Rosebrugh	52			(Sept.)	....	....	3	2	2	2	....	....
	1		(Oct.)	....	....	6	2	....	1	....	....	9
Seely	52		(Oct.)	....	....	6	3	....	....	....	....	9
	31		New York	(Sept.)	....	....	....	1	2	5	....	2
Sharp, Jr.	58	Chicago		(Sept.)	....	....	....	....	1	2	1	1
	31		(Oct.)	....	....	....	....	....	5	....	....	....
Swensson	88	Chicago	(Sept.)	....	....	....	2	7	2	....	....	11
	89		(Sept.)	....	....	....	2	7	2	....	....	11
Topham	88	W. Toronto, (Can.)	(Oct.)	....	....	....	....	5	....	....	....	5
	89		(Oct.)	....	....	....	....	5	....	....	....	5
Treadwell	23	Chicago	(Sept.)	....	....	....	....	3	1	....	....	4
	25		(Sept.)	....	....	....	....	5	1	....	....	6
Waitkus	26	Pittsburgh	(Sept.)	....	....	....	....	5	2	....	....	7
	42		(Sept.)	....	....	....	....	4	3	1	....	8
Waitkus	25	Pittsburgh	(Oct.)	....	....	....	....	5	4	1	....	10
	43		(Sept.)	....	....	....	....	12	5	....	....	17
Waitkus	62		(Sept.)	....	....	....	9	3	....	....	....	12
	25		(Oct.)	....	....	....	5	2	....	....	....	7
Waitkus	26		(Oct.)	....	....	....	5	3	....	....	....	8
	42		(Oct.)	....	....	....	5	....	....	....	....	5
Waitkus	43		(Oct.)	....	....	....	5	2	....	....	....	7
	62		(Oct.)	....	....	....	3	....	....	....	....	3

23 Observers. 45 different regions. 4500 square degrees of sky reviewed.

1 Observer. 5 photographic regions. Approximately 400 square degrees of sky reviewed.

The following observers employed the use of bins or low powered finders in the review of their regions: Ballhausen, Friton, Hanna, Karl, Kirkpatrick, Lewis, Loreta, McNabb, Jr., Moore, Rosebrugh, Sharp, Swensson, Topham and Waitkus. Grateful appreciation is tendered to the following participants for their kindness in summarizing their observations on their report blanks as originated by Diedrich and Keuziak and described in these notes in the October, 1937, issue of *Amateur Astronomy*: Diedrich, Friton, Halbach, Keuziak, Seely, Sharp Jr., Swensson and Waitkus.

\*\* Photographic regions for which no numbers have been assigned to date.

1410 N. Marshall Street,  
Milwaukee, Wis.

## Editorial Note

The publications committee has recently received a very good article from Harry Hall Haskin, Stony Creek, Connecticut, which discusses the hypothetical planet Vulcan. Unfortunately, the December issue of *Amateur Astronomy* was completely filled prior to the receipt of Mr. Haskin's paper, making it necessary to defer its publication until the January issue. Using the elements of the planet as theoretically postulated by Leverrier, Newcomb and others, Mr. Haskin calculated possible transits of the undiscovered planet for 1937 and 1938. According to his computations, a theoretical transit would occur on Jan. 14, 1938, with the planet placed about halfway between the center and northern edge of the sun between the hours of 9:00 A.M. and 2:00 P.M. (Eastern Standard Time).

Although the existence of Vulcan has been so often disproved, Mr. Haskin appeals to amateurs throughout the world to review the sun's surface during the period mentioned above as a matter of scientific interest from a negative point of view. He would appreciate receiving a complete record of each observation made regardless of how insignificant it may appear to the observer. Please communicate with Mr. Haskin at Stony Creek, Connecticut.

## The official monthly publication of the American Amateur Astronomical Association

Publication Headquarters  
1312 E. Curtis Place, Milwaukee, Wis.

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## Calendar for December

GEORGE DIEDRICH  
 (All Time C. S. T.)

Dec.

- 1 Wed.—Conjunction of Venus and the moon at 8:03 A. M. Venus, 2° 14' north.
- 2 Thurs.—New moon at 5:11 P. M. Annular eclipse of the sun. Invisible in U. S. in places east of 100° W. longitude.
- 4 Sat.—Conjunction of Mercury and the moon at 11:14 A. M. Mercury 40° 37' south.
- 6 Mon.—Conjunction of Jupiter and the moon at 5:59 P. M. Jupiter 40° 45' south.
- 7-8 Theta Geminid meteors.
- 8 Wed.—Conjunction of Mars and the moon at 6:00 P. M. Mars 6° 48' south.
- 9-13 Geminid meteor shower. Maximum on the 12th. (AMS shower.)

- 10 Fri.—First quarter at 7:12 P. M.
  - 11 Sat.—Conjunction of Saturn and the moon at 6:42 P. M. Saturn 7° 50' south.
  - 12 Sun.—Mercury at greatest elongation east. 20° 38'.
  - 17 Fri.—Full moon at 12:52 P. M.
  - 20 Mon.—Quadrature of Saturn and the sun. Saturn 90° east of the sun.
  - 22 Wed.—Sun enters Capricornus. Winter blows in at 12:22 A. M.
  - 24 Friday—Last quarter at 8:20 A. M.
  - 25 Sat.—Merry Christmas to you all.
- January, 1937.

- 1 Sat.—Best wishes for a bigger and better astronomical year. More novae, more comets, more observations. New moon.
- 1-4 Quadrantid meteor shower. Maximum on the 2nd. (AMS shower.)

3331 W. National Avenue  
 Milwaukee, Wis.

## Coup d'Etat

Having verily, in the sense of the word, "seized the power," and thus performed a *coup d'etat*, the Optical Division, AAA, wishes to preserve the memory of its famous deed for posterity.

We now have Rufus, the monkey of supernatural power, and we feel righteously proud of our great feat of kidnapping him on the afternoon of Sunday, Aug. 15, 1937, at approximately 5 p. m.

We, the Optical Division, AAA, send our sincerest thanks to A. W. Everest, M.M. and B.S.T.N., first order, for the kind information that every organization in the country has been trying to seize Rufus, blandly telling us that he doubted if it would be done. He never suspected that in our low minds there lurked the evil thought, "just wait till we get our chance!"

At 4:30 p. m., with careful stealth, the abductors seized Rufus and hustled him from Everest's cellar to the waiting car. At 5 p. m. goodbys were bid and the abductors were seriously told by Mr. Everest that he hoped to hear from them soon. In return he was assured that we would hear from him soon, the mocking significance of which he could not interpret at the time as we rolled lightheartedly down the street.

But it was Mrs. Lojas who insisted that we tell the grand potentate of mirrordom what we had done. And reluctantly we did. The look of A. W.'s face was worth it; possibly it was the height of amazement at our audacity. However, since we had successfully completed our *coup d'etat*, we were given the ultimatum that he (Rufus) would have to be returned in one year and presented with due ceremony and reverence to the leader of the Pittsfield group at Stella-fane.

Therefore, now that we have achieved the same social standing as the Boston group did on that memorable night at Oak Ridge a few years ago, we, the undersigned, wish it known that our consciences are free and that our mirrors from now on shall be more perfect than ever, or vice-versa, depending on the whims of Rufus, the supernatural charmer of paraboloids, oblate spheroids or what have you.

So let it be as is.

Lou Lojas  
Carl Grosswendt, jr.  
(chief abductors).

The assistance of J. J. Stoy of Atlanta, Ga., was greatly appreciated in the accomplishment of the deed.

## NAS Star Notes

WARREN E. PREECE, Secretary

The October meeting of the Norwalk Astronomical Society was held on the fifteenth, at the Norwalk Inn. The meeting was conducted by the vice-president, Harold Martin, in the absence of the president, Miss Helen Swartz, who, with two other members, Mrs. Hamilton and Richard Hamilton, was attending the fall meeting of the AAVSO at Harvard. After a short business meeting, Mr. Martin brought out an astronomical scrap book which he had started in the autumn of 1924. The group spent the entire evening reviewing the astronomical articles and pictures which Mr. Martin collected in the past 12 years.

## Milwaukee News Notes

M. N. FISHER, Correspondent

Motion pictures, both professional and amateur, were shown when the Milwaukee group met Nov. 13 at the University of Wisconsin Extension Division Building. The professional film, explained by E. A. Halbach, president, revealed the workings of the spectroheliokinematograph used in making "The Solar Bomb," a film showing the rapid development of eruptive prominences on the sun's surface.

The amateur movies taken by Messrs. Halbach, Cooke, Stamm and Dr. Fisher, detailed the development of the Milwaukee Society's observatory site in Waukesha county. One of the films clearly revealed the ingenious signs, "Follow the Stars" donated by Mrs. Adeline de la Ruelle. The signs lead motorists from Highway 15 to the observatory. A film taken by Mr. Halbach recorded the AAVSO meeting at Harvard.

The why and wherefore of the making of telescopes will be demonstrated at the January meeting. With the February meeting, the society hopes to start a series of topical meetings on the why of observing, what happens to the observations and where they fit in the researches of the professional astronomers.

The society sincerely welcomes the following persons to membership: Sister Mary Felice, E. C. Stoever, Roy L. Dodd and Henry Hunter.

Messrs. Kindt and Winther of Kenosha were visitors in Milwaukee during the month.

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Milwaukee, Wis.



cept through his telescope. It means a magnification of from 50,000 to 80,000. Many an experimenter has hooked up a microscope as an eyepiece and secured high magnification, but not of this order.

Mr. Schmidgall, who has been giving weekly talks over a Peoria radio station for more than a year, has discontinued

his radio work that he may give his entire time to his work on high magnification. Several Chicago amateurs are planning a trip to Peoria so that they may see with their own eyes the wonderful sights about which they heard.

3738 N. Richmond Street,  
Chicago, Ill.

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