A A V S O A B S T R A C T S

Edited by R. Newton Mayall

PAPERS PRESENTED AT THE 46TH SPRING MEETING, MAY 31-JUNE 2, 1957

Only twice in its history has the AAVSO held its annual spring meeting outside the confines of the United States. The first migration was made in 1940, to Toronto. The second was made this year, from May 31 to June 2, to Montreal, upon the joint invitation of Sir George Williams College and the Royal Astronomical Society of Canada - Montreal Centre. We are grateful, too, that we were the first astronomical society to which the Montreal Centre has been host. Except for our meeting in New York City, this one is unlike the others. Most of our spring meetings are held on college campuses which are removed from the teeming millions. The center of our activities in Montreal was in Sir George Williams College, which is squeezed in between large business buildings in the heart of Montreal and its more than a million population. The College is worthy of more than passing mention, for it is somewhat unique in that of the 5,253 students enrolled, 4,284 of them are evening students. During the day these students are regularly employed. The present faculty of Arts, Science and Commerce developed from the formal educational work of the Montreal Young Men's Christian Association (YMCA). Sir George Williams was the founder of the YMCA in London. It was not until 1932 that day-courses were inaugurated. Upon completion of the 4-year curricula, the student is awarded a Bachelor's degree. In 1948 the College was granted a specific charter for the purpose of conducting a College or University in the Province of Quebec. In addition to the College, there is the High School, Elementary School, Business School, School of Art, and School of Retailing. The attractive and modern building in which we held our meeting was completed in 1956. Once within the walls of this building, one loses the feeling of being in the center of Canada's largest and busiest city, where French and English are spoken with equal abandon.

The Montreal Centre can be justly proud of having such a pleasant and close relationship with their co-host. The College did everything possible to make our stay a pleasant one.

Friday evening we assembled in the auditorium of the College, where greetings from President Hall were brought to us by Dr. E. Russell Paterson. Dr. John S. Marshall gave the address of the evening on the topic of "Storm Studies by Radar." Following the lecture the Centre held a reception in the Student Common Room, where a colorful array of food was attractively arranged on a long table, in the center of which was a large frosted cake covered with stars, comets, and other astronomical objects and symbols scattered around the words "Welcome AAVSO." It looked too good to eat -- but! we like French pastry. It was a good opportunity for gastronomy and astronomy.

Saturday was given over to business and papers, and the meeting was so arranged that we had ample free time in the afternoon to window-shop or walk around town. In the evening about 100 gathered in the Laurentian Hotel, our headquarters, for a munificent dinner. Everyone was merry and we all had a wonderful time with our Canadian friends. After dinner we visited the Centre's observatory on the grounds of McGill University, where they have obtained a building that was doomed to be razed and have converted it into an attractive and commodious meeting room and library. The conventional dome atop the roof houses a 6-inch refractor, temporarily, which may be replaced with an 8-inch refractor.

On Sunday the Montreal Centre had arranged for us to go to Dorval Airport, where the meteorology laboratory was opened to us and the methods of research were explained and demonstrated. Also,we made a tour of the airport buildings, control tower, maintenance shops, and the nerve center. And as a climax, the Centre arranged for a special flight over Montreal and along the St. Lawrence Seaway project. One of the Trans-Canada airlines' new turbo-prop Viscount planes was used, which was a new experience even to veteran fliers. What a unique goodbye! Montreal Centre, we are grateful for all you did for us. As the cars left Dorval airport they separated and headed for all points of the compass, many of them to spend a few days seeing more of Canada-- to Quebec, the Laurentians, the Gaspe, and to many other wonderful places.

We were glad to see so many of our younger members at this meeting -- among them Philip Seldon and Jane Shelby. Among the many Montrealers who made our visit so pleasant and arranged for such good weather, we must acknowledge our debt to the Charles Goods (who had a grandson born Saturday morning), and to Isabel Williamson.

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STORM STUDIES BY RADAR, by John Stewart Marshall

Cloud physics is the name of a branch of meteorological research which studies water substance in the atmosphere. In winter time the relative motion of different air masses is a fruitful source of stratiform clouds and overcast skies. In such clouds snow can form above the 3 mile level and fall to the ground; if the temperature at low levels is above freezing the snowflakes melt on the way down to form rain. In summer, local heating causes cumulus clouds and thunderheads. The temperature of the atmosphere falls by 10°C per mile up. A parcel of air near the ground, heated by sunlight, rises and cools as it rises. If the air is moist the moisture condenses at some stage and forms clouds. The cloudy air continues to rise; the water droplets range in size from 8 to 36 microns at this point. Apparently summer rain is formed by growing droplets rather than by snow. As the cloudy air continues to higher levels, their diameters extend from 22 to 42 microns; in the latter size range, collisions are much more frequent, and drizzle and finally rain rapidly fall out of the cloud.

Large droplets, ice crystals, rain and snow can be observed by radar. Radar waves are about 100,000 times longer than light waves. Radiation from a transmitter is directed into the atmosphere by a parabolic reflection; when it strikes the droplets or crystals the radiation is scattered in all directions and some of it is picked up by the same antenna. The radar display effectively presents the map of the precipitation in an area up to 600 miles in diameter. By suitable means, horizontal and vertical sections can be shown. It might be interesting to superimpose the radar map over topography, send it out on television, and let you make your own forecast.

REVOLUTION IN EVOLUTION, by Florence Rosenblatt

It is the life story of stars in the main sequence evolving to the right of the H-R diagram, and then through to the white dwarf stage. This is done by nuclear transformation of hydrogen to helium and also by nuclear creation of heavier elements. Whether a star evolves from the main sequence to a position, for example, of a sub-giant, Cepheid, or a supergiant depends upon the mass and composition of that star. Whether the Carbon-Nitrogen Cycle or the Proton-Proton Cycle is the energy generating process in a star, the result is the same. The proportion of hydrogen decreases with time and the proportion of helium increases correspondingly. It used to be thought that in the evolution of a star, the helium so produced by these cycles got thoroughly mixed

throughout the star by means of currents circulating through it; but recent investigations indicate it is unlikely that there is any mixing in a star. The life story of a main sequence star is the life story of variables. (This paper was quite detailed in content and closely tied into the diagrams. The major sources consulted were Hoyle's Frontiers of Astronomy,and Struve's articles in Sky and Telescope, 11/55 to 8/56. ED)

CAN WE INTEREST YOU? by George Diedrich

There once was a man from Cordova
Who checked his area all over
While looking one night
He beamed with delight
At finding that long-sought-for nova.

After waiting for a good many years, we finally had a brief but definite look at a comet with an honest-to-goodness tail on it. This leads one to wonder whether the long overdue visual nova will be next. You may easily be the discoverer of it by accident, but your chances will be greatly improved if you make an intentional search of the sky under the AAVSO Nova Search Division program. Even though the number of areas assigned has doubled in the last two years, actually only about half the Milky Way is assigned. We cannot guarantee that you, personally, will find it; but we like to think that by organizing our search in non-overlapping areas, we will cover the sky so well that eventually one of our members can hardly help but find the next nova. Many of you -- and amateur astronomers in the societies you belong to at home -- certainly would find great pleasure in refreshing your knowledge of the constellations by our "dome check" and you would be doing the AAVSO,as well as yourself,a favor in specifically checking your own area(s) and reporting to us on the monthly report forms -- which we will be glad to furnish upon request. All we really ask is that you request information,and we will send you all the material necessary to get started on this worthwhile project.

To find a nova you have got to keep the slogan of this Division in mind, and that is "Keep Looking." (Write to George Diedrich, Chairman, AAVSO Nova Search Division, 653 Weller Road, Elyria, Ohio.)

OBSERVATIONS OF MARS IN 1956, by William H. Glenn

The opposition of Mars in 1956 gave members of the Observing Group of the Amateur Astronomers Association a unique opportunity to observe the Red Planet. Although planetary observation has never been among the strongest activities of the group, a total of 10 persons submitted 86 sketches. Only a few of the observers had any previous experience in planetary observing, so the opposition provided an opportunity for self-training as well as scientific study.

Actual observation was carried out on an individual basis by the members. Persons who had no instruments of their own were generally able to borrow AAA telescopes and, in some cases where individual instruments were not available, groups of two or three persons gathered together to use the same instrument. Large groups were avoided. The observing technique was for individuals to sketch the planet and to make necessary clarifying remarks on their sketches. This material was submitted to the group's planetary recorder, who organized the material and published the results in the group's publication, "The Eyepiece." Microfilm copies of all observations were made by Charles Cuevas, and the original observations were then forwarded to the ALPO Mars Recorder. Observers were advised not to consult maps or compute central meridians until after the observations were completed in order to reduce the possibility of suggestion in observing the faint details on the disc of the planet. Instruments used varied from

four to eight inch reflectors, to six and seven inch refractors. Magnifications varied, but most of the work was done in the 200X-300X range. Filters were used for some of the observations to improve the contrast between the dark maria and the reddish desert regions. Although red filters were effective with the 8" instruments, it was felt that yellow and orange were more useful on the smaller telescopes because not so much light was filtered out.

Some of the highlights of the opposition, as seen with Observing Group telescopes, are as follows: 1) the south polar cap was visible throughout the opposition. A detached portion of the cap was noted in September. The melt band was a conspicuous feature during the entire opposition. 2) the southern maria were very prominent prior to the period of general obscuration in September. The most prominent oasis was Solis Lacus The Nubis Lacus, which first attracted attention in 1954 was not as conspicuous as expected, but was nonetheless easily visible. 3) the canals were seen best in late July and early August. The canals radiating from Solis Lacus were seen easily in late July. 4) Discrete clouds,as opposed to the general obscuration occurring in September, were infrequent, although some were seen during late August and September. 5) Undoubtedly the most exasperating feature of the opposition was the heavy obscuring veil that covered the planet in late August and September. In October conditions improved considerably, but the decreasing size of the disc made observations more difficult. Sketches as late as November 19 showed that conditions were improving. The polar cap, melt band, and larger surface features were seen well at that time.

TWO MISPLACED STARS, by George Lovi

At the western portion of Eridanus there is a group of 4th and 5th magnitude stars which seem to form a semicircular asterism. These stars seem to suggest a flowing river very nicely, which is what Eridanus is supposed to represent. The two westernmost stars of this group, however, do not belong to Eridanus, they belong to Cetus. according to the official IAU constellation boundaries, which were adopted about 30 years ago. The stars which I am referring to are Pi Ceti, a 4th magnitude star, and Tau$_1$ Ceti,a 5th magnitude object. Observers who look at Eridanus take it for granted that these two stars belong to Eridanus, since they are a part of that "flowing" semicircular pattern. Originally, constellations were supposed to represent pictures in the sky which the ancients imagined. Some constellations bear much resemblance to what they are said to represent, and Eridanus is one of them. Since Pi and Tau$_1$ Ceti actually belong with Eridanus, why should astronomers sever those two stars so indiscriminately from it? These boundaries were formed in order to clear up confusion as to where any star or other fixed celestial object might belong and to establish the limits of each constellation. Why should those stars be in Cetus when they belong in a pattern with Eridanus? Those who have access to any publication with the boundaries in it will see what I mean.

A NEW TYPE OF COOPERATION, by Gunnar Darsenius

One of the points discussed at the IAU General Assembly in Dublin in 1955 was that a greater cooperation between the observatories and the visual observers ought to be established. The Institute d'Astrophysique in Paris intended to make a spectroscopic investigation of some U Geminorum type variables and wanted to be informed as soon as outbursts occurred. I have observed these stars for many years, and after a letter from our Director I contacted the l'Institute d'Astrophysique. By agreement I have sent telegrams to Paris when outbursts have occurred of SS Cygni, SS Aurigae, and U Geminorum. Five telegrams have been sent, and in each case I have had the luck to catch the beginning of the maxima.

FURTHER COMPARISON OF PREDICTED AND OBSERVED SUNSPOT NUMBERS, by Leith Holloway

In August 1956 the smoothed American relative sunspot numbers $\bar{R}'_A$, turned abruptly downward from the line having a slope of 8 spots increase per month along which they had been rising, according to my prediction, since they attained a value of 42 in August 1955. The latest available smoothed American sunspot numbers are given in the Table below along with the monthly mean values for the corresponding months and my previous predictions presented at earlier AAVSO meetings and in the Solar Division Bulletin. It now appears that the smoothed American numbers passed their maximum in February 1957 (1957.1) at a value of about 150, which is 46 below my predicted maximum of 196 forecast to occur at 1957.25. Since the Zurich numbers have been running from 10 to 15% higher than the American ones recently, Dr. Waldmeier's prediction of around 170 for the maximum of the smoothed Zurich numbers, $\bar{R}_Z$, will probably turn out to be quite accurate, as will his predicted time of maximum also. Paradoxically, February 1957 had the lowest monthly mean sunspot number for the 8 months since 6/56.

Month	Monthly Mean American Rel.Sunspot Nos., R'_A	Smoothed Values $\bar{R}_A$	Predicted R_A
April 1956	102.4	107	104
May 1956	117.3	114	112
June 1956	106.0	122	120
July 1956	117.9	129	128
August 1956	155.7	131	136
September 1956	159.5	132	144

VARIABLE STAR PROGRAM OF THE OBSERVING GROUP, by Edward G. Oravec

The Observing Group of the Amateur Astronomers Association of New York was formed in 1952, to coordinate all phases of observing and to stimulate interest in observing. Our organized variable star program began in July 1953. Several people in New York were observing variable stars before this and sent their estimates to the AAVSO. The first change was to have all observations sent to various recorders so that a record of the work and possible comments can be included in our monthly publication, The Eyepiece. The system today is for all observers to send their reports to me for each month by the 5th of the following month. I record them,and the totals for each observer are published in the Eyepiece. Graphs for about 75 of the most interesting and best observed stars are plotted from the estimates received. All original observations are then sent to the AAVSO before the 15th of the month. No changes or corrections are ever made on the report forms. Any discrepancies noted are reported to the observer and the cause traced. We are in the largest metropolitan area in the world, and it is accompanied by vast quantities of smoke, haze,and lights. New York weather is poor. Only one out of three nights is clear enough to see the stars,and certainly not on all of these can one do profitable observing. Several observers have telescopes and use them, but the majority use binoculars, for they are simpler to use under city conditions. For these reasons and others, we have concentrated on observing the brighter variables (to 10th mag)and long period variables at maximum. Every month in The Eyepiece I have a column devoted to variable star news, notices of meetings, activities of some of the stars for the past month, or a longer discussion of special stars. The list of observations reported for the month is included. Also a calendar of the Julian Day and decimal of a day in local Standard Time. There is a list of stars for study for the next month, giving the approximate magnitude and tendency of variation. The list includes all bright long period variables that are at maximum, and other stars that require more observation from our group. I also act as a

distributor for AAVSO observation blanks and other official information. We are now encouraging the Nova Search program. In the past 4 years about 35 people from our group, many in their teens, have made variable star estimates. We have amassed a total of 54,000 observations in that period. I do feel that our variable star program of the Observing Group is a valuable asset to AAVSO activities and a credit to the AAA of New York. I would suggest to all AAVSO members that they investigate possibilities for a program along similar lines for their local clubs and/or associations.

COMET COMMENTS, by Kenneth Weitzenhoffer

"It looks just like a comet!" This seemingly redundant remark was made by a number of amateur astronomers as they observed Comet Arend-Roland for the first time. All comets of recent years have had the most un-cometlike appearance to the naked eye or even through binoculars. When Comet Arend-Roland became visible in the evening sky, tail and all, it is not surprising that the above quoted comment was uttered. With the exception of Halley's Comet and the Daylight Comet of 1910, no really spectacular comets have appeared thus far this century. The 19th century,on the other hand,was noted for the number of "great" comets which made their appearance. The accounts of these famous comets might well make us envy the good fortune of the observers of that century. DeChéseaux's Comet of 1744 must be mentioned first. This remarkable object had six tails visible to the naked eye! The Great Comet of 1811 was remarkable in that it was under observation for 15 months. Conjunction with the sun occurred twice during its apparition. Because of the comet's high declination, it was circumpolar during the autumn of 1811. The Great Comet of 1843 was best observed in the southern hemisphere. A traveler aboard ship near the island of St. Helena described it as follows: "It was a grand and wonderful sight, for the comet extended the extraordinary distance of one-third of the heavens, the nucleus being, perhaps, about the size of the planet Venus*." According to Guillemin, it was one of the most brilliant ever observed. Not only the nucleus, but a portion of the tail was visible in full daylight‡. Even when the comet became visible in the northern hemisphere, the tail extended some 40° across the sky, although only 1° wide.

In 1858 Donati's Comet made its appearance. Several famous drawings show the comet's head passing over the star Arcturus on the evening of October 5th. The next year another bright comet appeared, but was described as "not spectacular." With almost clocklike regularity, a large comet appeared in the next decade. Coggia's Comet of 1875 had a tail 43° in length. The "Great Southern Comet of 1880" was visible in February of that year with a tail 40° long. Two lears later, Comet 1882 II was visible to the naked eye for a few weeks with a long,well-defined tail. It remained visible with optical aid for nine months.

During the 19th century comets were regarded as important astronomical objects. Therefore it is not surprising to note that many astronomers specialized in comet-seeking. Messier discovered 13 between 1760 and 1798. Of the 45 comets discovered between 1802 and 1827, Pons first observed 30, a tribute to his perseverance! Here is the total credited to other 19th century observers: Brooks discovered 20 comets,Barnard 19, Temple-17, Perrine-12, Winnecke-12, Giacobini-12, Swift-11. Coming to the present century, Leslie Peltier is the discoverer of 7 or 8 comets.

Comet seeking is an astronomical activity in which, even today, the amateur can compete with the professional. The only equipment needed is a Richest Field Telescope or other type of low power telescope. If you find a "nebula" in the field that is not in the catalogue and appears to be in motion, your name may well go down in astronomical annals as the first discoverer of a comet. Remember, you can be next!

NOTES: (* - Quoted by G.F.Chambers in "The Story of the Solar System," 1903,p.178)
(‡ - By A. Guillemin, "The Heavens," 1867, p. 286)

COMET AREND-ROLAND, by Charles Cuevas

Charles Cuevas showed several photographs, of exceptional quality, that he made of Comet Arend-Roland on the night of May 2-3, 1957. All photographs were made with a 4" x 5" Graflex with lens at f4.5, using Royal X-Pan Film and a 3-minute exposure. Film was developed in D-76. Excellent results were obtained with a telephoto lens. A particularly striking photograph was made for its pictorial effect and it appears on the cover of the July 1957 issue of Sky-Telescope magazine. (ED)

COMET AREND-ROLAND, by Cyrus F. Fernald

Cyrus Fernald had good seeing at his Wilton, Maine home, where he observed the comet. He estimated the tail as 20° long and 4° - 5° wide. (ED)

ELECTRONICS AND THE AAVSO, by Lewis J. Boss

More and more the ubiquitous electron is entering our daily lives,from the combined radio receiver and alarm clock that arouses one in the morning, to the late-late-late TV movie (20 years old), that puts us to sleep at night.

The amateur astronomer cannot escape this trend, and indeed many of us in the AAVSO have two hobbies, astronomy and amateur radio. Now there appears to be an excellent chance that the two will merge into a single avocation. Since 1911, members of the AAVSO have been watching variables through telescopes, sometimes under ideal climatic conditions, but more often under extremes of heat or cold. The job requires, in addition to a keen perception of light values, very good eyesight and a great deal of stick-to-itiveness. Our radio friends have discovered how to do it more easily and with greater accuracy. It is done electronically with the now quite easily put together photoelectric photometer. Moreover, the "electric eye" can see parts of the spectrum which are invisible to the human eye, and consequently a wider band of the spectrum is opened to observation.

In the AAVSO we are fortunate in having as a member one of the early experimental observers to use the photoelectric cell as an adjunct to variable star observing. He is Mr. John J. Ruiz, an active member of the AAVSO Photoelectric Photometer Committee and an indefatigable observer. Recently he has participated in two international observing programs covering selected variables with 24-hour observations by astronomers around the world. Mr. Ruiz has pointed out in an early discussion of photoelectric observing that, whereas in mechanical amplification,accuracy to one part in 100,000 is considered very good, in electronic amplification, accuracy to one part in 100 million is routine. It takes high craftsmanship to grind a telescope objective that yields a magnification of 300 diameters with good resolution, but a beginner can build an electronic device on his first attempt which is able to amplify the signals fed into it a million million times with equally good "resolution."

Plans are available from the AAVSO Photoelectric Photometer Division for building an electronic instrument for variable star observing, which aptly illustrate the simplicity with which electronics and astronomy can be wedded. The star selected for observation during the early stages of photoelectric observing should be an active one, such as the Beta Canis Majoris type, which goes through its whole cycle in a few hours. A full light curve can thus be made in one night, if the weather is good. Variable star observing by photoelectric means is an ideal project for two amateurs, one of whom has leanings toward electronic gadgetry and the other to take up the role of observer. Many interesting problems will have to be overcome, but the serious

amateur will find a helping hand extended by both the advanced observer and the professional as well. The AAVSO Photoelectric Photometry Committee members, comprising Mr. Ruiz, Mr. Claude Carpenter, and Mr. Lewis J. Boss, are available to answer your questions and to extend assistance in building and operating a photometer. (Anyone requesting information on PEP should write to Mr. Lewis J. Boss, 2111 28th Avenue, San Francisco 16, California. The PEP HANDBOOK is now ready for distribution and can be obtained from Mr. Boss. The price is $2.00 postpaid, and through his generosity the entire proceeds are placed in the AAVSO Endowment Fund. ED)

OBSERVING THE NEAREST VARIABLE STAR FROM THE ARTIFICIAL EARTH SATELLITE, by Leith Holloway

The sun is not only the nearest star but it is also the nearest variable star. It is inferred from observed effects on the earth's ionosphere that large increases occur in the sun's emission of ultraviolet light during solar flares. Much of the sun's ultraviolet is absorbed by the upper atmosphere (for example in the ionosphere) and thus does not reach the ground where it could be readily observed. The instruments on the first U.S. artificial earth satellite to be launched during the International Geophysical Year will measure for the first time the intensity of the sun's Lyman-alpha spectral line (of hydrogen) at 1216A. The maximum value of the Lyman-alpha emission received at the satellite during each revolution around the earth will be radioed to the ground. It is hoped that at least one solar flare will occur sometime while this particular satellite is in orbit and transmitting data.

The fourth satellite will probably measure the radiation balance of the earth including the value of the solar constant -- the total radiation from the sun. Individually these measurements will not be exceedingly accurate, but by statistical analysis it may be possible to reduce the observational error in these results below the 0.3% uncertainty obtained in measurements of the solar constant by ground-based instruments. If this is possible, the reality of previously-claimed variations in the solar constant may be proved or disproved, and it can be established whether the sun is a variable star in the sense that most AAVSO members define one -- namely, one which is variable in total visible light.

THE I.G.Y. IN THE CANADIAN ARCTIC, by Peter M. Millman

Dr. Millman's paper should be seen as well as heard. His many Kodachrome slides told better than words of the manner and difficulties of establishing a station in the Arctic at 82° north latitude. It is the farthest north habitation -- only about 400 miles from the Pole. All materials, equipment, and supplies are flown in. He showed both the barrenness and yet the beauty in the Arctic, which is not without its wild life, such as the Arctic hare and fox. The station is a joint venture, with the United States and Canada each supplying manpower and instruments for making a variety of observations during the IGY. Dr. Millman is fortunate to be associated with the venture, and we were fortunate in having such a vivid and entertaining account of the station and his work. (ED)

OUR CHOICE OF AN OBSERVATORY SITE, by Isabel K. Williamson

Many factors enter into the selection of a site for an observatory, but sometimes certain advantages have to be forsaken for more practical requirements. This was true in picking a site for the Montreal Centre Observatory. The advantage of dark skies, away from city lights, was given up for the need to have a suitable headquarters easily accessible and capable of including a dome. Such a site was found

on the grounds of McGill University, where a one-story building, built during the war years, was to be demolished. The Centre's problems were solved when they found it would be possible to use this building for a period of 10 years.

The members have completely renovated the building. They dug a cellar, extended the foundation walls, made a concrete floor, and constructed a steel dome. So far they have spent $5000. They are justly proud of their work, for they have comfortable headquarters, well-equipped with a small library, a large and pleasant meeting room, and several refracting telescopes. The dome is temporarily housing a 6-inch refractor. The observatory is used twice a week for observing -- Wednesday nights are for members only, and Saturday nights the public is invited. Having a home helped coordinate the group, and they are enthusiastic about their future. (ED)

SEEING CONDITIONS IN THE MONTREAL AREA, by T. F. Morris

As can be expected in a great metropolitan area such as Montreal, the best seeing is about 6 magnitude. The presence of smog and reflected light from it raises the background light level. Also there is instability in the atmosphere, which cuts down the seeing. The combined transparency and contrast cuts the seeing down to about 5.7, and in the country outside the city the seeing is about 6.3 on the best nights, which occur about one night a month. Under normal Montreal conditions the seeing is about one magnitude less or brighter.

Dr. Morris discussed the Arend-Roland comet. He said the general opinion is that it was not as bright as predicted. He referred to the formulas in L'Astronomie (January 1957) for determining the magnitude:

$$M_1 = 5.1 + 5 \log \text{ (Astron. Units)} + 10 \log \text{ (Standard Distance)}$$

$$M_2 = 3.0 + 5 \log \text{ " " } + 15 \log \text{ (" ")}$$

The Montreal Centre modified these formulas to $M = 6.6 + 5 \log (AU) + 19.5 \log (SD)$, which gave values they felt were nearer correct and indicated that the comet was fading rapidly. (ED)

PLANNING AN OBSERVING PROGRAM, by Francis P. Morgan

When observing long period variable stars, it is desirable to make two regular observations a month. The observations should be properly spaced, not less than about 10 days apart (except during a rapidly changing phase) and not more than 3 weeks. For those observers whose observing time is mostly restricted to the hours preceding midnight, this is not always easy, as cloudy weather and bright moonlight can defer observations for quite a lengthy period. For those who observe at any hour of the night, this is not too much of a problem -- one just observes when the moon is below or near the horizon, omitting only a few nights during full moon. Where certain irregular types need frequent observations, one just observes at any opportunity.

The time not to observe is from the 7th day to the 16th or 17th day moon. Plan to begin observations on the first night that the moon rises at least an hour after sunset, or the first clear night thereafter. Then make the second observation of the same stars ten days later, or the first clear night thereafter. Although a spacing of observations of about two weeks may be more desirable, one has to allow for cloudy skies if observations are to be completed before the 1st quarter moon.

I find that while moonlight greatly reduces the number of stars visible to the naked eye and in the finder, the magnitude limit of stars visible in the field of the main eyepiece does not seem to be reduced by a factor of more than 0.5 mag., provided there is no haze. Except for the red stars, the difficulty is one of finding rather than one of actual observing and magnitude estimating.

DO U.F.O.'S EXIST?

by Robert W. Dunn

In 1951 Clyde Tombaugh, amateur astronomer and discoverer of the planet Pluto had, with other witnesses, personally sighted unidentified flying objects. He stated: "These things, which do appear to be directed, are unlike any other phenomena I ever observed." Thousands of statements have been made by pilots, radarmen, trained ground observers, prominent scientists and engineers.

Admiral Delmar Fahrney, known in the Navy as the father of guided missiles, stated: ".....As long as such unidentified objects continue to navigate through the earth's atmosphere, there is an urgent need to know the facts. Many observers have ceased to report their findings to the Air Force because of the seeming frustration -- that is, all information going in and none is coming out."

The important fact is, the Air Force has admitted there are sightings that cannot be definitely explained. Twenty percent of the reported observations are classified as unknowns, but that does not mean that 80% of the reports were falsified or are hoaxes. In many of the 80% group sufficient information was lacking and could not be properly evaluated. The newspapers played up the weird and fantastic stories, and they thrived on the sensationalism of the fanatics. There is a reason why the newspapers could not print the facts.

On August 26, 1953, A.F.R. 200-2 was issued by order of the Secretary of the Air Force, Harold E. Talbott. Paragraph 9 of this document provided that only hoaxes, practical jokes, and erroneous U.F.O. reports can be released to the press. This would indicate that the Air Force distrusts the American public. An open mind and serious approach to the U.F.O. question is the only sort of foundation that can support a study of any weight.

Even in certain astronomical observations, we encounter a psychological factor. Several competent observers, for example, have claimed to have seen remarkably fine details on the planet Mars, while other equal or more able observers, using equipment and conditions as good or better, have seen only broad and diffused features. It seems that an observer, being well trained and conscientious, can be a victim of his own imagination.

I will agree that many such observations of Unidentified Flying Objects can be classed as quirks of the imagination, but with thousands of sightings and reports, this explanation does not seem valid, especially since radar has simultaneously tracked these objects.

It is important, if an object is observed, that all facts be recorded. A brief description of the object or objects, shape, size, color, number, formation if more than one, features, trail or exhaust, speed, sound, maneuvers, manner of disappearance, and other pertinent or unusual features should be recorded.