R E G U L U S

THE NEWSLETTER OF THE

ROYAL ASTRONOMICAL SOCIETY OF CANADA - KINGSTON CENTRE

SEPTEMBER, 1980

A REVOLUTION IN AMATEUR ASTRONOMY

A revolution is currently taking place in amateur astronomy. What other word could be used to describe the series of outstanding advances in equipment and techniques that we are now witnessing? Equipment being made by and sold to the amateur astronomer is now of the kind that we only dreamed of a decade ago. It could certainly be only a dream ten years ago for some of it had not been invented and some was found only in the hands of professionals at the world's most renowned observatories. The techniques, too, now used by the amateur astrophotographer were a short time ago employed as experimental ventures by the professional.

One of the most noticeable aspects of the Equipment Revolution has been the Aperture Explosion. A decade ago the typical amateur astronomer may have owned a telescope whose aperture was 3½ or 4 inches, aspired to building a "6-incher", and beguiled himself in his wildest fantasies (for fantastic yearnings, they surely were) that he would one day own an "8-inch". He knew of one person in his half of the country who owned a "10-inch"; well, he did not <u>really</u> know him but once at a club meeting he had met a person who knew a friend of the 10-inch-owner, and that friend had even looked through it. That was about a decade ago.

Let us now remind ourselves of the situation today: 10, 12, and 14-inch telescopes seem to be everywhere. The Dobsonian Era has dawned; the age of the massive light-bucket is upon us. With this simple and now-common type of mounting, faint and far-distant vistas of our universe are open to our wondering gaze. One member of our centre has almost finished his project of constructing a 16"--to be used in hunting down faint comets. Another member of our society has told me of his purchasing a 17½" mirror--from a very reputable manufacturer and at a price that a short while ago would have been reasonable for a high-quality 6" telescope. Now when his telescope is assembled he will have an instrument with over eight and one-half <u>times</u> the light-gathering power of the 6" instrument he night conceivably been tempted to invest in a few years ago. The manufacturer of the mirror just mentioned, an organization not usually inclined to idle boasting, has stated that, with it, literally every N.G.C. object can be detected, and as most amateurs well know, of the thousands of objects in the N.G.C. catalogue, many are very faint and many extremely faint. A brief perusal of my copy of the catalogue led me to a few examples: N.G.C. 5503 - Magnitude 16.0, N.G.C. 5527 - Mag. 16.0, N.G.C. 5421B - Mag. 17.0, N.G.C. 1606 - Mag. 17.0, and N.G.C. 96 - Mag. 17.0. It is amazing that such faint objects can be seen now in amateur instruments. Another member of our society has recently told me of his latest project - building a 25" Dobsonian. It is not a wild dream; his previous projects have included some superb instruments, perhaps the finest home-built telescopes any of us have seen. Who knows where the Aperture Explosion will end?

The Equipment Revolution is also operating at the eyepiece end of the telescope. Better oculars are readily available to the amateur. New configurations of lenses, higher quality in the glass and other material used, larger oculars, rich field adapters, oculars with greater eye relief for a given focal length--all of these items tend to create a better view of the heavenly wonders. Add to that the nebular or L.P.R. (Light Pollution Reduction) filters and you have a welcome concept in filters --a piece of glass that actually brightens the faint nebulous object in your eyepiece or reduces the harmful effect of light pollution.

The equipment and techniques now used by the astrophotographer are enabling him to produce stunning results as never before. Proof of this can be had by merely looking through recent astronomy periodicals or attending some of the slide shows at current meetings. Besides their outstanding results, astrophotographers notice something else

../2

above the latest wave of equipment. It is more convenient to use. For a few years now cold cameras have been bringing to amateurs the impressive results of chilled film emulsion. It used to be an inconvenient operation with the insertion of one frame of film at a time into the camera. Now a whole roll--36 exposures of 35^{mm} film--can be popped into the new camera and the film is merely rolled on as usual after each exposure. It no longer requires an hour's patient work to go from one frame to the next. That's an hour that can now he spent in making three outstanding twenty-minute exposures of deep-sky objects.

The latest addition to the list of techniques and processes which are now assisting the astrophotographer is one which I have found almost amazingly helpful. It is the use of hypersensitized film. Film which has been gas-sensitized gives outstanding results in the photography of nebulas and other astronomical objects. The colour balance of the film is improved arid there is a tremendous gain in film speed (or sensitivity to the faint light from the nebulas). My first experimental use of sensitized film gave colour slides of well-known nebulas, pictures of only five or six minutes, which were similar to ones that might have been three or four times as long with ordinary film. Guiding for five minutes is easier than guiding for fifteen or twenty and there is only a fraction of the chance that Murphy's Law will take over. In fact, amateurs are now beginning to do their own sensitizing of the film right in their own homes, again something that until this your was almost never done except at the big observatories.

The list of new techniques and new kinds of equipment now used by the amateur could go on. Suffice it to say that the Equipment Revolution is a major part of the greater Astronomy Revolution now taking place.

This is a revolution that is leading to a greater enjoyment of the wonders of the night sky by more and more people and a greater appreciation of its awesome vastness and profound complexity. Let this Revolution continue!

FOR YOUR COMPENDIUM OF ESOTERIC FACTS

Here is a fact to remember when someone says he has seen the most beautiful star or the most beautiful "double" in the sky.

There is actually a star that is called The Most Beautiful One. It is ε (epsilon) Boötis and, in fact, it is a double, really a binary system. For approximately a century and a half it has had the proper name, Pulcherrima. This is short for Stella Pulcherrima, two Latin words whose English translation could be "the most beautiful star (in the sky)".

How did a binary system come to be honoured with the name, Pulcherrima? It was conferred by F. G. W. Struve who in 1829 discovered the bright object to be a pair of outstandingly fine colour contrast. The primary star, at magnitude 2.47, is yellowish-orange, and the other, at magnitude 5.04, is bluish in colour.

One observer clearly separated this pair with a 2 1/4" telescope but less experienced observers may need a larger instrument for this extremely fine pair since their angular separation has been listed as only 3".

The next time you are observing with a 4", or a larger instrument, be sure to try to resolve this spectacular star system. ε Boötis is located about 10 degrees north-east of Arcturus.

Here is another interesting fact. (There is more for your money this month--three or four facts for the price of one.) The Pulcherrima Boötis system, at combined apparent magnitude of 2.39, is eighty-second on the list of brightest stars in the sky. It is certainly easy to see in the sky; now just get them resolved in your telescope for a real astronomical experience. Pulcherrima!

REPORTS AND OTHER ITEMS

1/ The weather was largely uncooperative for many people at the time of the maximum of the Perseid Meteor Shower. However, hundreds of them were seen by members of our centre if we add together those seen by all our members who observed over a period of a couple of weeks. It was my impression that the Perseids began quite early this

../3

year and were spread over a long period of time. Angelika, Jeff, and I all saw bright fireballs and at least two of them may have been members of the Perseid shower.

This month continues the meteor watch for members of a number of minor showers and prepare for the Draconids and Orionids in October reaching maximum about the 9th and 20th respectively.

2/ David and I, and perhaps a few other members of our centre did have a chance to observe one eclipse in 1980 even though we did not travel to Kenya or India in February. I am speaking of the penumbral lunar eclipse of August 25th-26th. I thoroughly enjoyed watching this eclipse. The darkening of the moon was clearly perceptible. Though no part of the umbra of the earth touched the moon and even the penumbra did not cover all of the disk, it was evident that the upper part of the moon was darker than the rim near the south pole. Observing the slight degrees of darkening as the faint shadow moved across mountains and maria was a thoroughly fascinating study in slight changes in brightness.

3/ I understand that Comet Tuttle is now in the constellation Camelopardalis and Enke is in Perseus. If, for either of these two objects, particularly the latter, anyone has an ephemeris for dates earlier than given in the Observer's Handbook, I would appreciate hearing what they are. Early predictions had them listed to reach the 8th and 7th magnitude ranges later this year.

4/ It was a pleasure to visit with David Levy on several occasions this summer, to have him at an observing session, and to have him at a dinner withour centre on August 30th. We wish him continued good luck with his observing programs in Arizona. Best of luck, also, to David in his using his new telescope, a 16" Newtonian. The glimpses we caught of it on August 30th left us quite impressed.

5/ There are certain things to note in the coming month:

(1) the close approach of the old moon to Venus in the morning sky on September 5th. It should be a spectacular conjunction well worth photographing if the weather permits it.
(2) the Harvest Moon rising so soon after sunset during the last week of the month.
(3) the close approach of the moon and Aldebaran on September 28th.
(4) the interesting configurations of the old Moon with Venus and Regulus on October 4th-5th. Remember that the September Equinox occurs on the 22nd at 21:09 U.T.

6/ If anyone is interested in using the 16" telescope, he is invited to telephone Jeff at 548-7462. Jeff has also informed us that he has an 8" Newtonian which he is willing to have other people come and use.

7/ There was a discussion at the last meeting about ways to insure that we make more use of our centre's 10" telescope. Suggestions included changing the meeting nights to Friday and arranging car pools to Mike's place. Come to future meetings and express your ideas about these and other items affecting our centre. We are also interested in having ideas about displays for Clubs Night at Queen's University.

8/ Remember the dates of the upcoming regular meetings:

Sept. 18th -- Oct. 2nd -- Oct. 15th. The time is 8:00 p.m. and the place is Room 222, Ellis Hall.

At this time, I should print our address so that you may send us any information or correspondence you wish. It is-

R.A.S.C. - Kingston Centre,
Box 141, Station A,
Kingston, Ontario K7M 6R1

9/ This is a reminder about your dues. Your 1981 membership fees may be sent or given to Jeff, our Treasurer, at any time now. The regular fee is $16.00, and for youth membership, it is $10.00. Make cheques payable to the Kingston Centre of the R.A.S.C. (A Youth is a person under 18)).

Clear Skies and good observing!