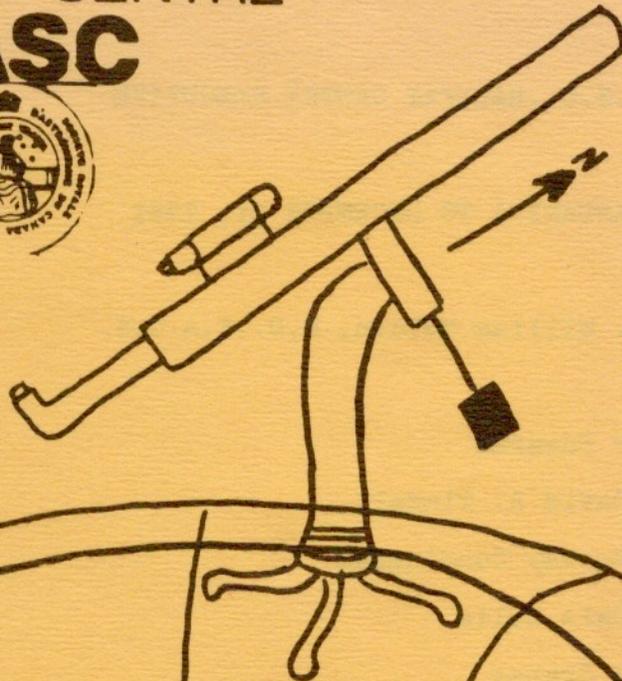


HALIFAX CENTRE **RASC**



March-April, 1981
Vol. ~~1~~, No. 2

12



NOVA NOTES

In this issue

Secret of STONEHENGE
&
Ed's Message to the people
plus
much, much more; exciting
articles and columns by
soon to be infamous
world disowned authours
and discredited scien-
tists. Serious articles,
by reputable persons
are also included.

The 1981 R.A.S.C., HALIFAX CENTRE EXECUTIVE

EFFECTIVE JANUARY 1 TO DECEMBER 31, 1981

Honorary President: Dr. William Holden, M.D., F.A.C.S.

President:	Peter Edwards	835-3615
Vice-President:	Dr. David A. Tindall	455-7456
Secretary:	Dr. Murray Cunningham	429-4751
Treasurer:	Dr. Dale Ellis	466-7351
Editor:	Glenn Graham	443-8349
Nat'l Rep.:	Dr. Roy Bishop	1-542-3992
Librarian:	Diane Brooks	434-7274
Observ. Chmn.:	Walter Zukauskas	423-2400

SUBSCRIPTION RATES FOR 1981/1982

NOVA NOTES is available to non-members of the HALIFAX CENTRE, R.A.S.C. at the rate of 35¢ per single issue or \$2.00 for six issues per annum. We can still fill orders for the rest of the 1981 subscription year and the entire 1982 year. Contact the editor(see above) for more information.

Nova Notes is
 printed
 courtesy
 of the Nova
 Scotia Museum.

Minutes of Meetings.....pg.1
 Notice of Meeting.....pg.1
 From Ed.....pg.2
 Letter.....pg.3
 From Centres.....pg.3
 Binocular Observing.....pg.4
 Poem.....pg.5
 From Centres cont.....pg.7
 Book Review.....pg.7
 In Praise of the Hooker.....pg.8
 Greetings.....pg.11
 Constellation of the month.....pg.12
 Astrophotographypg.14

Dear Mr. Genius...

Letters that suggest how innovators are:
 (check one)

- Nibbled to death by ducks
- Whipped into a quivering mass of jelly with limp spaghetti
- Pounded to a pulp by marshmallows
- Strangled by red tape
- Drowned without a trace in bureaucratic goo
- All of the above

Dear Professor Galileo:
 Your request for permission to drop two weights from the bell tower of the Cathedral of Pisa is hereby denied. As you yourself state, the philosophical question you are studying has already been discussed by Aristotle...

Dear Dr. Einstein:
 Acknowledgement is made of your recent request for a leave of absence from the Swiss Patent Office to develop your theory of relativity. We do not feel that your project falls within the mission of this agency, and therefore suggest that if you wish to continue this line of inquiry, you should seek employment elsewhere.

Dear Mr. Newton:
 Your theory of "gravitation" (as you call it) will doubtless interest many people, but we feel that its practical value has yet to be demonstrated. Enclosed are the requisite forms for providing evidence of its relevance to certified national needs. Please fill out each form in quintuplicate and return it to this office. In addition, it might be helpful to enclose letters from 10 or more colleagues willing to comment on the usefulness of your project...

Dear Dr. Freud:
 We are rejecting your request for support in developing what you term "psycho-analysis" because you have failed to include documents showing that your research belongs to the field of medicine. We are also concerned that you have not installed safety nets on your couches as required by regulations governing the use of human subjects in scientific research...

Dear Mr. Darwin:
 Your request for a grant to study what you call "The Origin of Species" by natural selection has been referred to this office for review. After carefully reviewing your proposal, we feel that it duplicates a current project of Mr. Alfred Wallace and therefore do not believe monies can be expended on your research...

1 JAN. MEETING

FEB. MEETING

This was "member's night" or our annual potpurri.

Walter Zukuskas reviewed the observing sessions that have been held recently with quite good turnout.

We were then treated to a film whose name I've forgotten but if I describe it you will know. It opened with a picnic of a family in a park in Chicago then the "camera" rose vertically by increments of an order of magnitude more distant. Very soon the picnic was invisible in the sprawl of Chicago, then the Great Lakes and soon the whole earth. "At this order of magnitude" speed we were soon way out in our solar system and then at the edge of the galaxy. Soon we passed our cluster of galaxies. (One light year is 10^{15} meters) We came to the limit of our known objects in space at the distance of 10^{24} m. The movie then whizzed back to the family picnic but did not stop there but seemed to enter the back of the man's hand to look at even smaller objects. Finally at the infinitely small size of 10^{-16} m. we saw the proton. Just think of it EVERYTHING lies between 10^{24} and 10^{-16} in other words a total size range of 10^{40} !!

Roy Bishop showed his usual superb collection of slides, this time of observatories both in Nova Scotia and abroad, ending up with a shot of that great 200mm telescope of the Mactomkas Observatory.

Dr. Scrimger had many other pictures of observatories he had visited.

We then viewed the video tape of Dr. Helen Hogg on "Front Page Challenge". This was good fun and it shows that our Honourary President cannot be put down by Gordon Sinclair!!

The guest speaker was Barry Mouzar who until recently ran a splendid shop selling telescopes of very high quality. Perhaps Toronto could support such an establishment but I guess we didn't buy enough here. His talk was not about that but about his other hobby-radio. He introduced us to the electromagnetic spectrum. What a range - from 10 Hz. (cycles per second) to say 1.1 MeV. where the most elementary matter, the electron is annihilated. Barry is a Ham radio operator and rather too much of his splendid talk was spent demonstrating the glories of that hobby. But he had in his hand throughout the small book of assigned frequencies of the International Telecommunications Union. I came away with the discouraging observation that Business, Amateur Radio and the Military have a great deal of clout and Radio astronomy has almost none. It is being squeezed out. We have quite a few frequencies assigned to us but we must share several of these. There are two "silent windows" that we must keep open - one centered around OH^+ which extends from 161.231 to 172.530 MHz. and the other from 1350 MHz. to 1400 MHz. There was a long list of available frequencies both in the MHz. range and in the GHz. range; but far be it for 'Nova Notes' to be an authority on Radio Astronomy-- consult this small blue book of the I.T.U.

Murray Cunningham

NOTICE OF MEETING

Feb. Friday 13 (one week early). This is the anniversary of the discovery of Uranus! Dr. Roy Bishop (who always gives an entertaining talk) will fill us in on the details.

FROM ED.

My first issue of 'Nova Notes' was far from perfect, as you all know. I will take this space to pass on some of the comments made to me and what I intend to do about them.

Starting with the cover I apologize for putting Red Dwarfs where Red Giants are supposed to be. The cover will be changed from month to month and I will try my best not to make any silly slip-ups like that in the future. Also last issue was Jan.-Feb. 1981 Vol. 12, No. 1.

This editorial column was completely unreadable and I realize now that only the very best of typewriters with carbon ribbons will reproduce well (I'm learning). Starting with this issue the page numbers will be put on the outside edge of the pages. One of the comments I had was that there was so much black it looked like a funeral edition! (Check page #3 of last issue) To avoid this appearance most of the borders will be done away with. A line of *'s will now follow the end of each article so that even if an article doesn't seem to finish you'll realize when you're at the end.

To Murray Cunningham, Peter Edwards and Kevin Ellis I apologize for not giving you by-lines. To Norman Scrimger and especially Randall Brooks I apologize for the slightly ludicrous caricatures. As most of you know they really don't look quite so bad and I must say they were really good sports about it.

They took the caricatures in a humorous manner as they were intended. To the Nova Scotia Museum I apologize for not acknowledging that the printing of this newsletter was done by your courtesy to us. To the members of the executive I apologize for the

prohibitive cost of the first edition; however I must stress that most of that is a non-reoccurring expense. On the topic of expenses if people could save their envelopes and give them back to me for recycling that would represent a great saving. To Norman Scrimger I apologize that the stars on the front cover weren't round but the 'seeing' was especially bad. (I was sleepy and couldn't 'see' what I was doing)

Certain things in this issue were conspicuous by their absence: a table of contents, subscription rates, (and some people thought) a notice of meeting. From here on the notice of meeting will always have a border around it.

It occurs to me that I've done a lot of apologizing so I am now going to list the things I am proud of:

- 1) The articles were great and I would like to thank every person who contributed.
- 2) The letraset headings for the columns looked better than if they were simply typed.
- 3) The columns themselves looked better than some people feared!
- 4) I believe the idea of regular columns of which we now have three (I would like more) was a good idea and will prove very popular.
- 5) It was my very first attempt at anything of this nature, and I was in the middle of exams at the time, and personally it was as good as I expected my first edition to be.

I appreciate all comments concerning 'Nova Notes', criticisms and all, although being a basically vain person I appreciate a clap on the back, or a kind word, once in a while.

Sincerely,
Your Editor,
Glenn Graham

LETTER

In a recent article in 'Nova Notes' an authour (this means you Michael;ed.) mentioned the use of binoculars. Do you know where one can purchase binoculars of 20 or 30 power suitable for Astroviewing? (presumably for planets;ed.) I see them advertised in 'Sky and Telescope' but I have not been able to find a source in Canada.

yours very truly
J.M.Sandham
Charlottetown,P.E.I.
C1A 1H4

Reprinted from 'Nova' Newsletter of the Vancouver Centre.

Editorial

The observatory project has progressed rapidly since the appointment of David Dodge as Observatory Supervisor. The central concrete pier will be used to mount the new 16" Clavis Mulstron telescope.

The completed observatory is expected to cost between \$215,000 and \$235,000 or about \$2000 per member; a small(?ed.) price to pay for a modern facility such as this. The cost of the observatory will be supported largely by bake sales and rummage bazaars(now that really is bizarre; I wonder what they put in their brownies!ed.) Also, a large portion of the centre's ammassed capital(a staggering \$4,500) will be invested in speculative stocks. (nervy bunch!ed.)

Barring any majour setbacks, the observatory is expected to be fully functional by April, 1994.

FROM ED

Reprinted from 'Scope', Toronto Centre's newsletter.

GETTING STARTED IN SOLAR OBS.

Since August 1979, I've been observing sunspots - and it's been proving to be an incredibly interesting type of observation. The sun is a fascinating object and one which we perhaps take for granted. But you'll entice your scientific imagination when you start observing sunspots, because once you start the questions just keep on coming: What are sunspots, anyway? What makes them form? Why do they erupt in cycles? And why do they gather in the particular formations that they do - configurations which have been observed over and over again by seasoned observers, but which we still know relatively little about?

This is a particularly good year for sunspot observation because we're in the period of Solar Maximum - the high point of the eleven year sunspot cycle. In fact, solar scientists from eighteen countries have designated August 1979 through February 1981 as Solar Maximum Year, in order to study this active solar period.

For my own observations, I use a C-90 catadioptric telescope - one which uses both mirrors and lenses. It has an aperture of 90mm(just under four inches) and a 1000mm focal length, which gives a good-sized image of the sun.(I believe what she meant to say was that it provided fairly good resolution ed.)

And, oh yes. You need a filter if you plan to observe the sun directly. While most people know that Galileo was one of the first people to observe sunspots many people don't know that he also gave in persuit of

astronomy its best known case of solar retinopathy (i.e., sun-induced blindness). It can't be said to often: NEVER look at the sun through a telescope without a proper filter! (Coloured glass filters that fit into the barrel of an eyepiece are not safe and do not qualify as a 'proper' filter!) You can fry your eyes in a split second...and you won't feel a thing. (until it's too late!)

Now for the good news - aluminized mylar or polyester filters are both safe and inexpensive. When I first started observing the sun, I purchased three sheets of aluminized mylar from a local science store. Borrowing from an old hobby, I mounted the membranes on an embroidery frame. This frame consists of two rings, one set inside the other. The outside ring has a screw adjustment, allowing you to tighten or loosen it. To get the frame to fit snugly over the C-90 objective, I cut a styrofoam circle large enough to fit tightly over the objective. Then I put a small ridge in the styrofoam circle in which to set and glue the inside ring of the frame. I set the mylar sheets on top of this, and then placed the adjustable ring over them, screwing the ring tight. (For those of us who are less thrifty R.T. Little, see ad 'Star and Sky', offers the same type of filter for apx. \$60.00-6 inch, \$65.00-8 inch, \$110.00-14 inch. Canadian prices.)

This filter has worked well, eliminating all harmful infrared rays and giving a restful, cream-coloured image of the sun. It allows you to see great sunspot detail, but its major disadvantage is its failure to produce optically good photographs. For that purpose

4
the aluminized polyester filter is a better bet.

The best time to observe the sun is in the morning. That's the time when there is the least amount of air pollution. You'll also find the seeing conditions tend to be better early in the morning because as the earth heats up later in the day, it causes turbulence, or "boiling" of the solar limbs. (and a general lack of definition of surface ed.)

I observe the sun every clear morning. I keep a blank page notebook in which I've drawn circles equal in size to the aperture of my telescope. In these circles I draw the spots seen on the solar disc each observing day. I also mark in the date, universal time, weather conditions, including the amount of turbulence and some description of any spot configuration I find interesting.

When you start observing, you may have some difficulty lining up the sun. Just remember you can't use your finder, as you do at night. I put a cap over mine and tape it up, as a check on my absentmindedness early in the morning. To line it up with the sun just move both axes of the telescope until the sun casts the smallest shadow on the ground. It's much easier to get the sun into view and keep it there with an equatorial mount but it isn't exactly difficult even with an altazimuth mount.

The most exciting thing about sunspot observing is watching the growth and development of sunspot groups day by day. If you are lucky, you may observe small streaks of white towards the limb of the sun. (Really not at all uncommon ed.) These are faculae or plagues, which are often associated with disturbed areas likely to erupt into sunspots. Remembering that the sun rotates from east to west, you may look again the next day and notice that, over 'night' cont. 2nd pg. following pg. 6

5 BINOCULAR OBSERVING

As we now move into warmer weather, one can see the Spring Star - Arcturus, rising in the east. Also very prominent in the sky are Jupiter and Saturn. Be sure and watch the conjunctions in the coming months.

During January, a fairly bright comet was visible. It was Comet Bradfield 1980t. It was a superb sight in binoculars. The tail went from .5 to .75 degrees in width. It had a blue coma with jets protruding and a bright white nucleus.

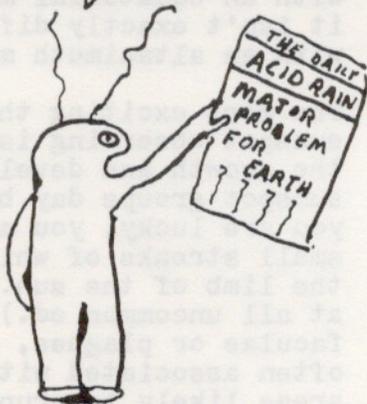
On April 22nd is the Lyrid meteor shower which produces about 15 per/hr. Those of you who look solely at the planets should take a moment out to observe these and other wonders in the heavens; such as the galaxies in Virgo. How many can you see? And don't forget to take a look at those two splendid doubles, Gamma Virginis and Leonis.

In the morning project the sun. Who knows you might even be fortunate enough to see a white light flare. So get out your HANDBOOK and enjoy the sights.

Don't forget to scan the horizon after sunset for comets - who knows you could be another Rolf Meir.

Michael Boschat

THEY SHOULD SEE WHAT WE
ENDURE HERE ON VENUS ?



A.G.G. Inc. Original



by John Ciardi

Idon't suppose you happen to know why the sky is blue? It's because the snow takes out the white. That leaves it clean for the trees and grass to take out the green. Then pears and bananas start to mellow and bit by bit they take out the yellow. The sunsets, of course, take out the red and pour it into the ocean bed or behind the mountains in the west. You take all that out and the rest couldn't be anything but blue.--Look for yourself. You can see it's true.

ATLANTIC

PHOTO

AGENTS FOR

TASCO

CARL WETZLAR

SWIFT

BUSHNELL

MINOLTA

PENTAX

LEITZ

BELL & HOWELL

TELESCOPES

&

BINOCULARS

ATLANTIC

423-6724

PHOTO

423-8820

SUPPLY LTD.

5505 Spring Garden Rd., Hfx., N.S.

Ask about our courses

The art of colour photography

Audio-visual seminar

cont. SOLAR OBS.

a new group has formed where the faculae was to have been in 24 hours.

On April 3, I observed faculae on the east side of the sun, and two days later, a large, complex pair of groups had developed. I saw these two groups develop to about twenty degrees of the solar disc before moving over the western limb of the sun. Because these groups are so large, they may survive their rotation around the other side of the sun, to reappear on the eastern limb. (On May 1st this group did reappear ed.) The sun takes roughly 24 to 30 days to rotate on its axis, with the equator moving faster than the poles. When you watch spot groups this size, it's intriguing to realize that we still have very little knowledge of how and why they evolve as they do - even though we know that the spots are associated with electro-magnetic phenomenon and that they have positive and negative polarities.

Recently, I have begun to photograph the spots after I have made my drawings each morning. Just remember that solar photography like all astrophotography, requires lots of trial-and-error experimentation.

At present I am learning to count spots and groups in accordance with the program of the AAVSO. The solar section of this organization collects sunspot data for use by solar observers. But if you're just beginning, refined spot counts can wait. The sunspot activity you see (or don't see) will spark your curiosity enough to get out of bed on the coldest winter morning. It's fun to look at our nearest star-- and wonder.

Carole Giangrande

BOOK REVIEW

The Universe and Dr. Einstein by Lincoln Barnett. Pages 124; 10.5x17.5cm. William Morrow and Company, Inc., 1980. Price \$2.50 (paperback).

The Universe and Dr. Einstein is a spectacular overview of Albert Einstein's theories of relativity, both the special and the general theory. This book presents in a most readable and enjoyable manner the major concepts of relativity as well as some insight into the thought involved in their formation. Written for the informally trained science buff, The Universe and Dr. Einstein uses language that brings a light of understanding to the reader. More complicated terms and concepts are explained in footnotes and a short appendix.

Barnett has captured the essence of mass, gravitation, and spacetime and has passed on this outlook in a way that is unbelievably understandable. Many concepts that are verbosely and often inadequately explained are laid down in The Universe and Dr. Einstein so that their true core of meaning becomes impressed upon the mind of the reader; and while many will never be able to completely describe in their own words the ideas of gravity and time, they will always feel the enlightenment of understanding gotten from this book.

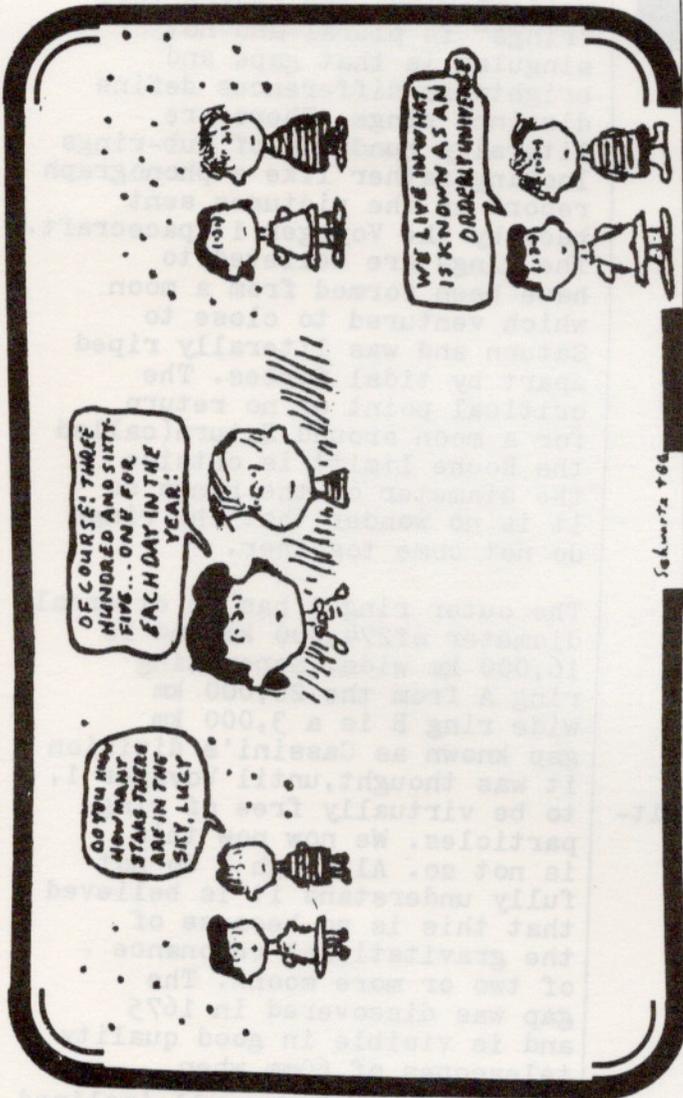
Some of the questions answered by this book will help to get the amateur scientist out of awkward positions: A question like, "Why can't there be travel faster than the speed of light?" can be easily explained to the poser.

The Universe and Dr. Einstein is an excellent first book on a reading list of books on relativity and would make an excellent text for teaching in

high schools as it gives the reader an undeniable advantage in learning what relativity is about. A reading list at the end of the book provides the reader with a path to follow in building his understanding of the theory of relativity.

In the forward to the book, which was written by Albert Einstein, he states that, "The main ideas of the theory of relativity are extremely well presented." This must surely have been Albert Einstein's greatest understatement.

Mark Maclean



In Praise of the Hooker

by Roy L. Bishop

The history of science has been, in part, the history of man's attempt to strengthen and quantify his feeble senses with precision instruments. The prototype of scientific instruments is the telescope. The telescope appeared early in the scientific revolution and today still has a major role in the advance of knowledge.

Of all the telescopes that have been raised to the heavens, two can be singled out for their pivotal contributions to astronomy. The first is the crude refractor that Galileo turned on the Moon in the autumn of 1609. Within a few months Aristotle's concept of the unblemished perfection of the heavens, together with the Ptolemaic universe, lay in ruins. Earth had been wrenched from the center of creation and the plurality of worlds was more than forbidden speculation.

The other telescope deserving of special praise is the 100 inch reflector on Mt. Wilson above Los Angeles. John D. Hooker, a business man of that city, provided the funds for its mirror in 1906. By the end of the First World War it was complete, a precise symphony of girders, and rivets, and glass. Here, for the first time, a professional telescope exceeded the aperture of that of an amateur. It was larger than that giant of the Irish mists, the 72 inch Leviathan of the Earl of Rosse.

Within a decade a new universe was revealed in the mirror of the Hooker reflector. Through cepheids in M31, M33, and NGC 6822, the telescope enabled Edwin Hubble to confirm that the Milky Way was not the universe, but only one of countless galaxies. After a few more

cont. on pg. 10

Seh... 484

SATURN: BEAUTIFUL RINGED ORB
 Reprinted from the observers
handbook and modified by Glenn G.

Saturn is the telescopic show-piece of the night sky. The chilling beauty of the small pale orb floating in a field of velvet is something no photographs or description can adequately duplicate. The rings consist of billions of particles which, according to photometric, radar and other data, are believed to be approximately fist-sized and made of - or covered by - water ice. This would account for their exceedingly high reflectivity. The reason that "rings" is plural and not singular is that gaps and brightness differences define distinct rings. There are literally hundreds of sub-rings looking rather like a phonograph record in the pictures sent back by the Voyager 1 spacecraft. The rings are believed to have been formed from a moon which ventured to close to Saturn and was literally ripped apart by tidal forces. The critical point of no return for a moon around Saturn (called the Roche Limit) is outside the diameter of the rings so it is no wonder that the rings do not come together.

The outer ring A has an external diameter of 274,000 km and is 16,000 km wide. Separating ring A from the 26,000 km wide ring B is a 3,000 km gap known as Cassini's division it was thought, until Voyager 1, to be virtually free of ring particles. We now know this is not so. Although I do not fully understand it is believed that this is so because of the gravitational resonance of two or more moons. The gap was discovered in 1675 and is visible in good quality telescopes of 60mm when the ring system is well inclined to our view from earth.



If anyone out there has a screen which they would be willing to loan the editor with between 65 and 85 lines per inch it would be greatly appreciated.

Did you know:

A recent test done by researchers proves conclusively that Disco music makes white mice turn homosexual and that they are worried that it might have similar side effects on humans.

According to the latest results that laboratory mice cause cancer.

That mild manner Jody LeBlanc is in reality Galileo Galilei; see pg.#10 of this issue.

That sightings of the planet Vulcan, by reputable observers, transiting the sun was really just a perfectly round sunspot!

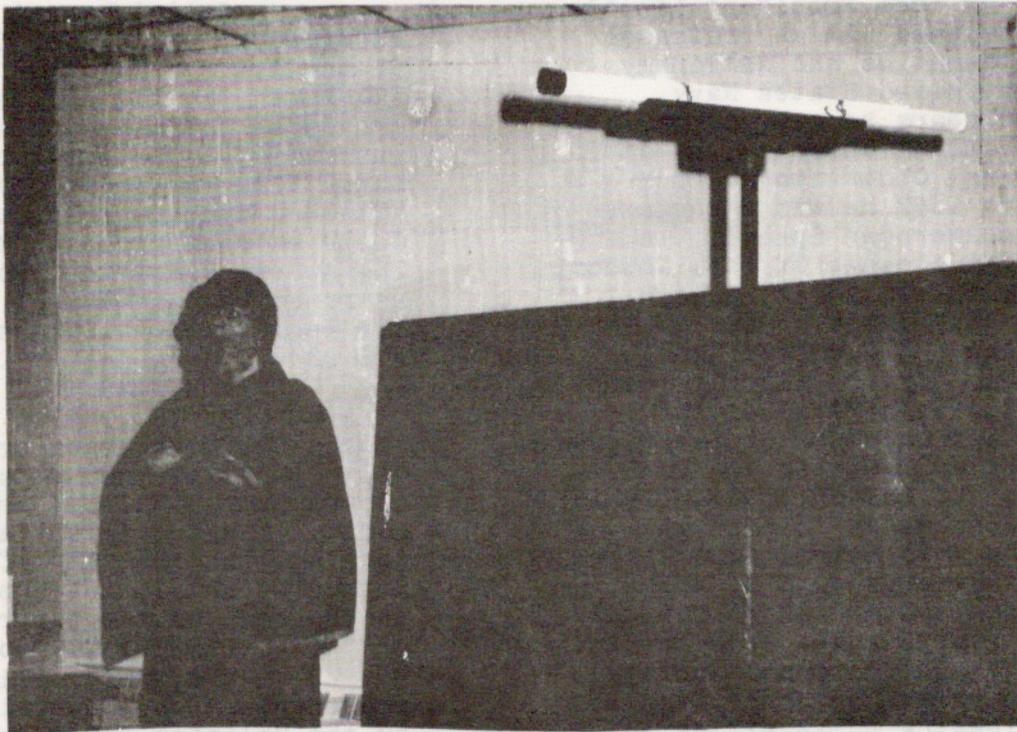
cont. from 'Hooker'

orbits of the Sun, the instrument provided Hubble with unequivocal evidence for the expansion of the universe, a prediction made earlier by Albert Einstein with his general theory of relativity, but a prediction so staggering that even Einstein could not accept it prior to Hubble's data. In the Hooker mirror man had seen himself in an obscure corner of an immense universe, a dynamic universe with a finite, violent past and an uncertain future.

Today the glow of man's energy waste has degraded the skies over Mt. Wilson, but no newer instruments have yet equalled the accomplishments of the Hooker. Larger telescopes, and telescopes probing other regions of the spectrum have brought confirmation and extension, but no comparable revolution.



Plus-X, 1/30 second, yellow filter



A portrayal of Galileo Galilei by Jody LeBlanc a few years ago at a local science fair. Note the phases of Venus, the moons of Jupiter and the extraordinary number of stars on the blackboard. (Which probably did not reproduce very well) These were three of the pivotal discoveries of Galileo. Note also the duplicate of Galileo's telescope. (Galileo and I observed Jupiter and Saturn through it - talk about short eye relieve!)

Due to unforeseen circumstances 'GREETINGS' by Kevin Ells will not appear here this month. It will however be back in next issue.

SIMON NEWCOMB AWARD

At the meeting of the Council of the R.A.S.C. on May 21st, 1978, a proposal from the Halifax Centre, the SIMON NEWCOMB AWARD, was adopted. The award is named after a native of Nova Scotia, an astronomer who was the foremost man of science of his time in America.

Simon Newcomb (1835-1909) was born at Wallace Bridge, N.S. At the age of 18 he moved to Massachusetts and later to Washington, D.C. where he spent his entire professional life. In 1861 President Lincoln commissioned him as Professor of Mathematics and Astronomy in the United States Navy. For 16 years he carried on astronomical observations at the Naval Observatory. From 1877 to 1897 he was superintendent of the American Ephemeris and Nautical Almanac Office; Newcomb became the world authority on the orbital dynamics of the moon and planets. Among the many honours which he received were the Gold Medal of the Royal Astronomical Society (1874), the Copley Medal of the Royal Society of London (1890), President of the American Association for the Advancement of Science, the first president of the Astronomical and Astrophysical Society of America (the present American Astronomical Society), and seventeen honorary degrees from leading universities in the United States and Europe.

RULES: A) Topics

Awards will be given for articles relating to astronomy, astrophysics or space science. Topics should interest average to well-informed amateurs and

may be of current or historical interest.

B) PRESENTATION

Articles should be 1000-1500 words, written in proper grammatical form and presented typewritten and double-spaced. Diagrams need not be in finished form but should be complete and ready for drafting. Photographs may also be submitted and if possible original negatives should accompany the submission. References should be included and according to the style used by the Journal.

C) ELIGIBILITY

Any R.A.S.C. member in good standing may submit articles. The intent of the SIMON NEWCOMB AWARD is to recognize literary ability among non-professional members of the Society.

D) Submission of Entries

Articles must be received by the Awards Committee of the R.A.S.C. between Jan. 1 and March 31. (All entries in the Burke Gaffney Contest are automatically entered, but hurry time is almost up) Unattached members will submit their entries directly to: The Awards Committee, Royal Astronomical Society of Canada, 124 Merton Street, Toronto, Ont. M4S 2Z2.

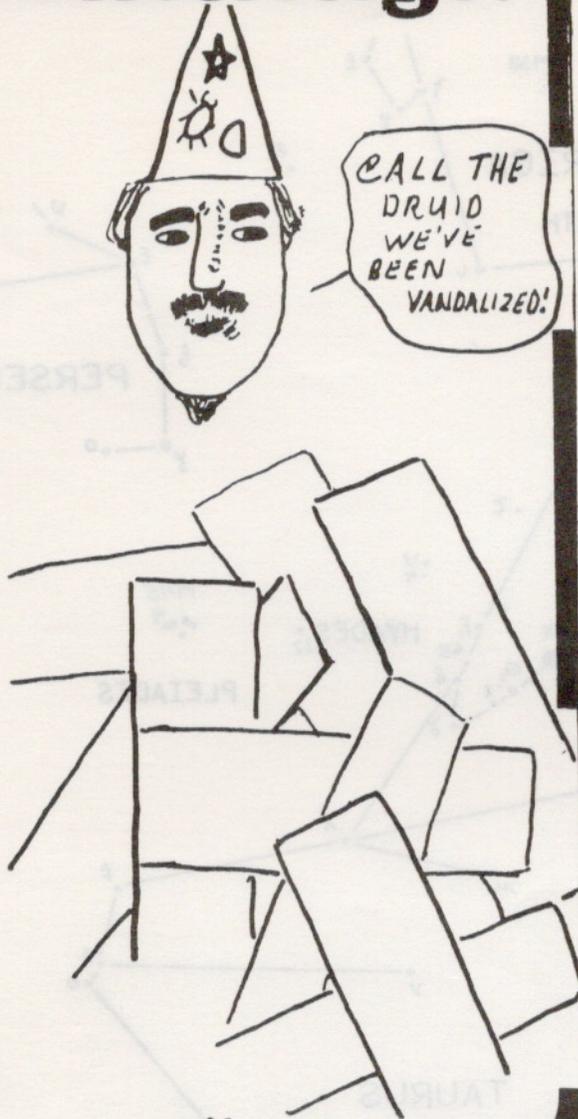
E) JUDGING

Articles will be judged by the Awards Committee. Criteria shall include scientific accuracy, originality, and literary merit. To maintain unbiased judging, the identity of the author(s) should not appear in the body of the paper.

PRESENTATION of AWARD

The award will be presented at the General Assembly by the Halifax Centre representative to the winner. (or proxy) The award will remain in the hands of the winner's centre for display and will be returned to the National Office by April 1 the following year. If the winner is an unattached member the award will remain at the N.O.

Stonehenge!



TAURUS: THE BULL

- Norman Scrimger. 12

Taurus is a winter constellation often neglected by amateur astronomers. Since it is in the neighbourhood of the well-known Orion, it does not receive the attention that it deserves. Taurus was important to man living about 4000 to 6000 years ago because the vernal equinox occurred in Taurus, and spring marked the new year for the ancients. Due to precession of the equinoxes, the vernal equinox has moved westward through Aries to Pisces today, and will soon be in Aquarius.

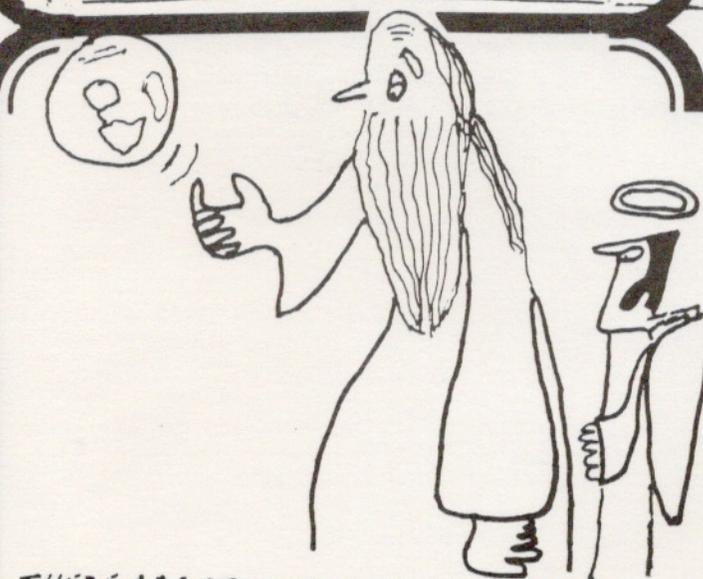
According to the old Greek legends, Jupiter, the king of the gods, at one stage fell in love with Europa, daughter of the king of Crete. Jupiter plotted to abduct the princess and so changed himself into a white bull --Taurus. In this form he persuaded Europa to ride upon his back, and when she did, the bull rushed into the sea and swam away. (Jupiter still has Europa with him as one of the four Galilean moons.)

Since the flanks of the bull would be under water as he was swimming, Taurus is commonly depicted in the sky as only the large "V" forming the horns and the head of the bull. The other stars comprising Taurus are fainter, and not well known by amateurs.

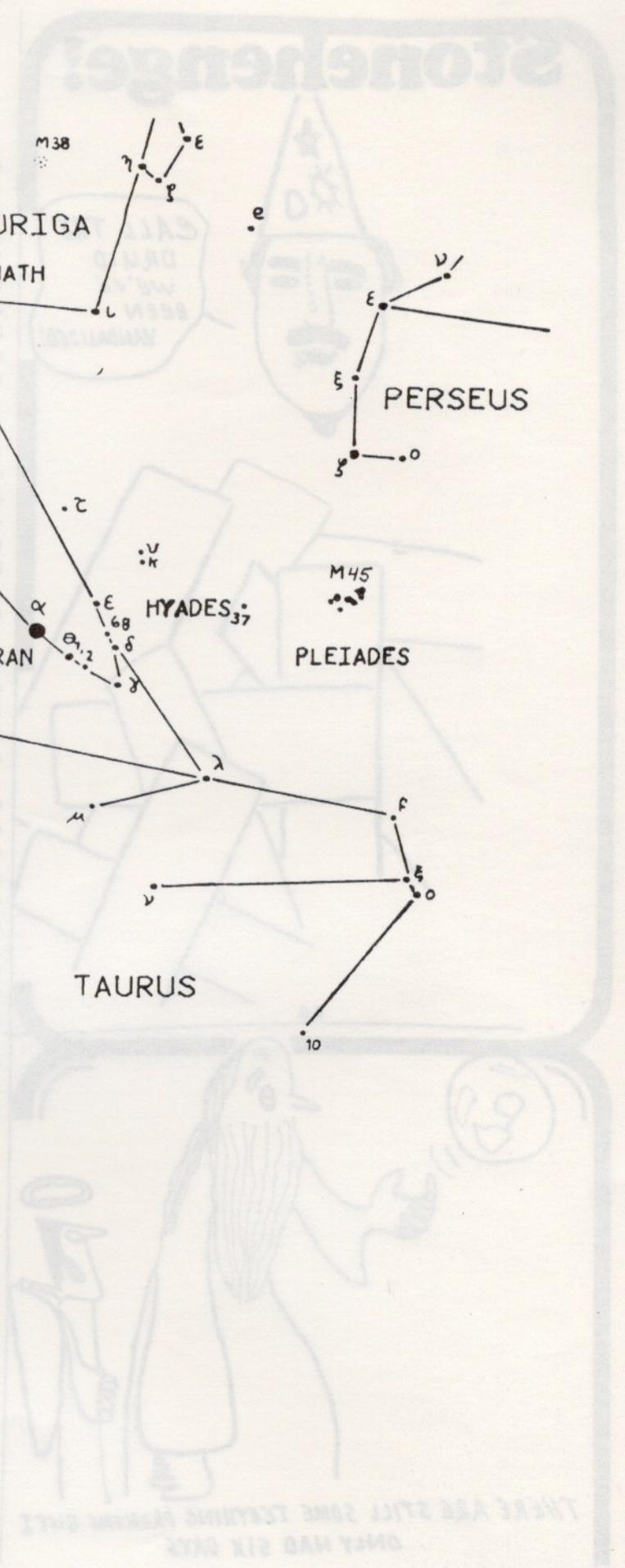
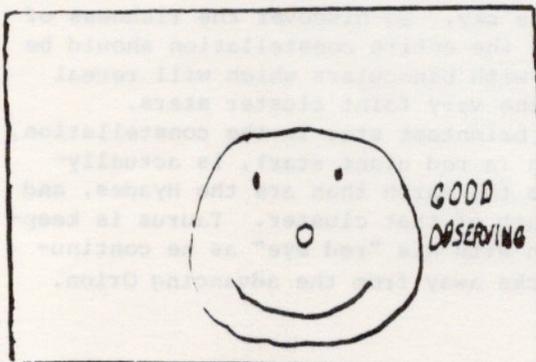
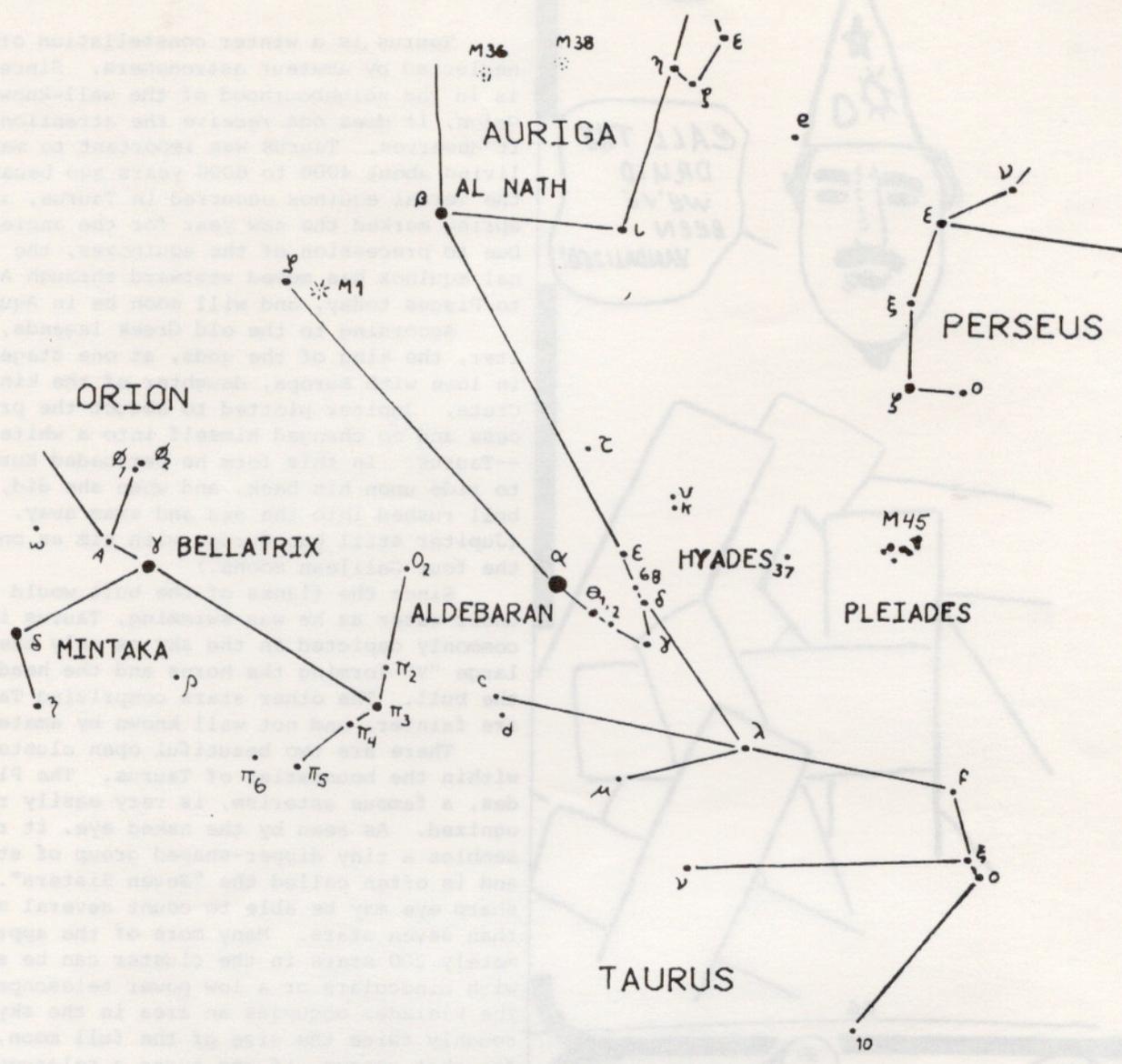
There are two beautiful open clusters within the boundaries of Taurus. The Pleiades, a famous asterism, is very easily recognized. As seen by the naked eye, it resembles a tiny dipper-shaped group of stars, and is often called the "Seven Sisters". A sharp eye may be able to count several more than seven stars. Many more of the approximately 200 stars in the cluster can be seen with binoculars or a low power telescope. The Pleiades occupies an area in the sky roughly twice the size of the full moon, and for that reason, if one turns a telescope on the cluster, a low power is required to see the entire field of stars.

The members of the other open cluster, the Hyades, cross the face of the bull and form the "V", which is the most noticeable part of the constellation. The Hyades cluster is nearer to the earth than the Pleiades cluster, and therefore appears more spread out in the sky. To discover the richness of the area, the entire constellation should be examined with binoculars which will reveal many of the very faint cluster stars.

The brightest star in the constellation, Aldebaran (a red giant star), is actually nearer to the earth than are the Hyades, and is not part of that cluster. Taurus is keeping watch with his "red eye" as he continuously backs away from the advancing Orion.



THERE ARE STILL SOME TEETHING PROBLEMS BUT I ONLY HAD SIX DAYS





ASTROPHOTOGRAPHY

In astrophotography, as in normal photography, it is a good idea to choose several films as 'standards' and become familiar with their characteristics. Astrophotography has enough variables without adding the problem of an unfamiliar film.

Since "Astrophotography" covers such a wide range of applications, it isn't really possible to pick a single universal film. While the "When in doubt use Tri-X" approach will usually produce some sort of picture, it is preferable to fine-tune the selection of film to suit the individual application. The key words are still familiarity and predictability-keep the variety of films down to a reasonable number.

Paralleling normal photography, the astrophotographer is usually faced with a choice of resolution vs film speed. Such compromises as can be worked out will depend on the equipment available as much as anything else. Despite the 'extenuating circumstances' caused by individual equipment, (something I'll address in a later column) some general principles can be kept in mind in matching a film to a particular application.

Rather arbitrarily I've divided astrophotography into five categories: Wide-field (piggyback), deep sky, lunar, planetary and solar. In this issue I'll deal with two of these: piggyback and deep sky photography.

Assuming you get over the tracking problem, (hint: wide-angle lenses give both spectacular views of the Milky Way and relaxed guiding requirements) piggybacking your camera on your telescope will produce some attractive photographs without presenting any insurmountable obstacles.

High-speed films are in their forte here: starfields do not require high resolution so graininess is not much of an

BY JODY LEBLANC

objection. I have taken an 8x10 of Cygnus taken on 2475 Recording Film processed to ASA 4000 (more about 'push processing' in a minute). Any normal subject would look like it was printed on sandpaper, but in this case the grain is not objectionable at all.

The primary concern in wide-angle photography (since it is long exposure photography) is RECIPROCITY FAILURE. This nasty term means that with long exposure times (over a 1/2 second with most films) a film's sensitivity will drop off-obviously a problem for astrophotographers. Reciprocity Failure is bad enough in black and white photography, but it is especially insidious in colour films. Each emulsion layer (colour films have an emulsion layer for each primary colour) has its own DIFFERING rate of reciprocity failure- thus a film's colour balance is no longer in balance.

What to do? Some films are especially designed to reduce this problem, but they involve compromises of their own. I prefer to stick with common, 'off-the-shelf' films and avoid long exposures as being unguidable anyway. By running a few exposure tests one can readily see when reciprocity failure becomes a big problem- and that's a good point to stop the exposure.

Corrective filters are not a practical solution for maintaining colour balance during the long exposures of astrophotography. Adding filters increases the necessary exposure time, which requires increased filtration, which further increases the exposure time... You can see my point.

With colour slide films you can try various brands until you get a colour tone

you find pleasing. (Note to people on a tight budget don't overlook house-brand films.)

Colour prints are another matter. By all means try the 400 ASA print films, but find a lab that can do custom colour balancing or has a lenient policy on redos. Direct Film claims to offer an astrophotography service, but I haven't tried it as of yet. It's a good idea to shoot one normal picture at the beginning of the roll to give the lab a point to work from.

One way to combat reciprocity failure is to 'increase' the films sensitivity during its useful exposure time. The most common way of up-rating a film is PUSH PROCESSING: basically overdeveloping the film to bring out underexposed detail. This works quite well with black and white and colour slide films, but don't try it with colour prints. A 'one stop push' (doubling of a films ASA rating) is usually the practical limit, but darkroom wizards may attempt a greater boost. "Push processing" or

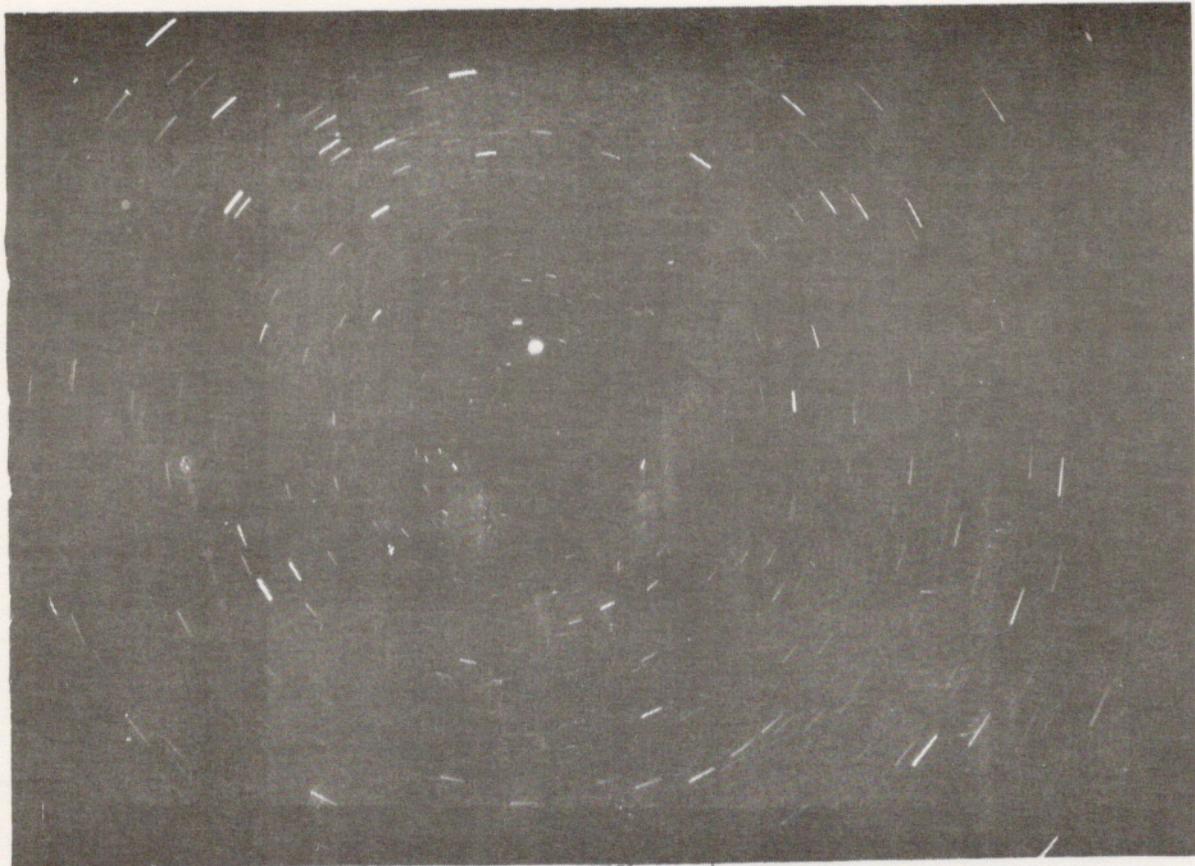
"boosted processing" is available for most slide films (except Kodachrome) at almost any lab.

All these factors affecting the choice of a film suitable for piggybacking also apply to choosing a film for deep sky work - but for deep sky work a film's resolution and graininess must be taken into account. (I define deep sky photography as photos - other than planetary and such - taken through the telescope. Photos taken with long focal length camera lenses are sort of semi-deep sky photography)

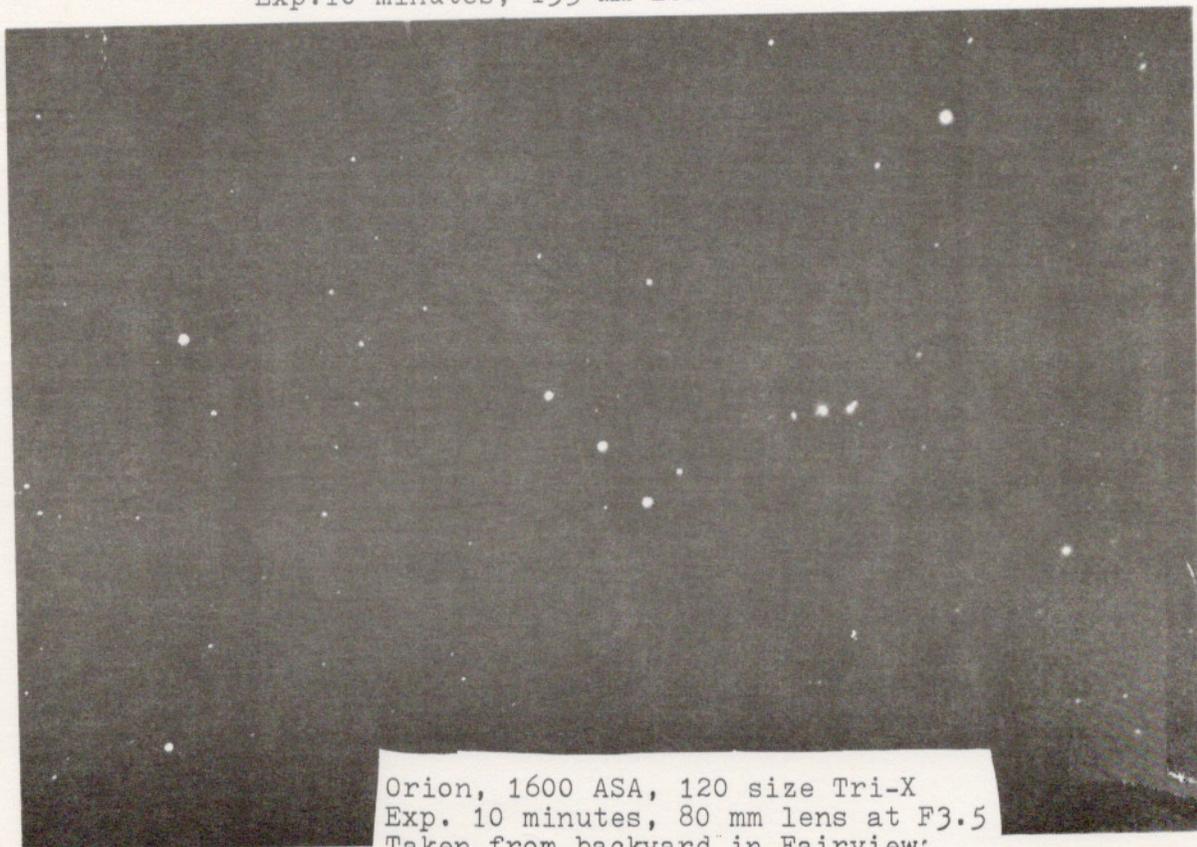
Because of the graininess problem (often made more apparent by the need to greatly enlarge a tiny portion of the negative) one is restricted to film speeds of 400 ASA or slower. If you use black and white film, it should be processed in a slow working, fine grain developer (such as Kodak Microdol-X, diluted 1:3) and be given an extra bit of T.L.C.

Next Issue: Films for lunar, planetary and solar photography.

Type	Brand	Nominal ASA	Comments
<u>Colour Slide</u>	Kodak	Ektachrome200	—relatively fine grain
		Ektachrome400	
	*Fuji	Fujichrome100	—400 ASA Brand new worlds cheapest 400 ASA but very grainy, sloppy processing
		Fujichrome400	
	*3M/Kmart	100	—
		400	
*Direct Film	Dirachromel00	—similar to Fujichrome	
*Woolco	Woolcrest100	—v. contrasty, erratic processing	
<u>Colour Print</u>	Kodak	Kodacolour400	a fine line between most.
	Fuji	Fujicolour400	3M perhaps a bit slower.
	Direct Film	Diracolour400	Lab will determine final quality
	3M/Kmart etc.	400	
<u>B&W Print</u>	Ilford	HP5 400	—available in 72 ex. roll (for meteors)
	Kodak	Tri-X 400	—the standard
		2475 Recording 1000	—pushable to 4000 ASA- 'LeBlanc's favourite'
	Agfa	Agfapan 400	—hard to find, slower than HP5/Tri-X, but has finer grain.



Star trails, Tri-X(ASA 800)
Exp.10 minutes, 135 mm lens at F2.8



Orion, 1600 ASA, 120 size Tri-X
Exp. 10 minutes, 80 mm lens at F3.5
Taken from backyard in Fairview;
same is true of the startrails.