

FROM

HALIFAX CENTRE R.A.S.C.
1747 SUMMER ST.
HALIFAX, N.S.

TO

Marie Filler,
Exec. Sec. R.A.S.C.
252 College St.,
Toronto 2B, Ont.



HALIFAX
1747
SUMMER ST.
N.S.

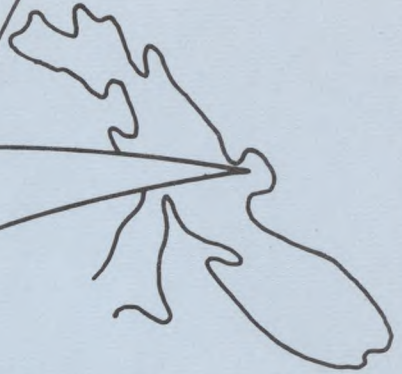
May 172

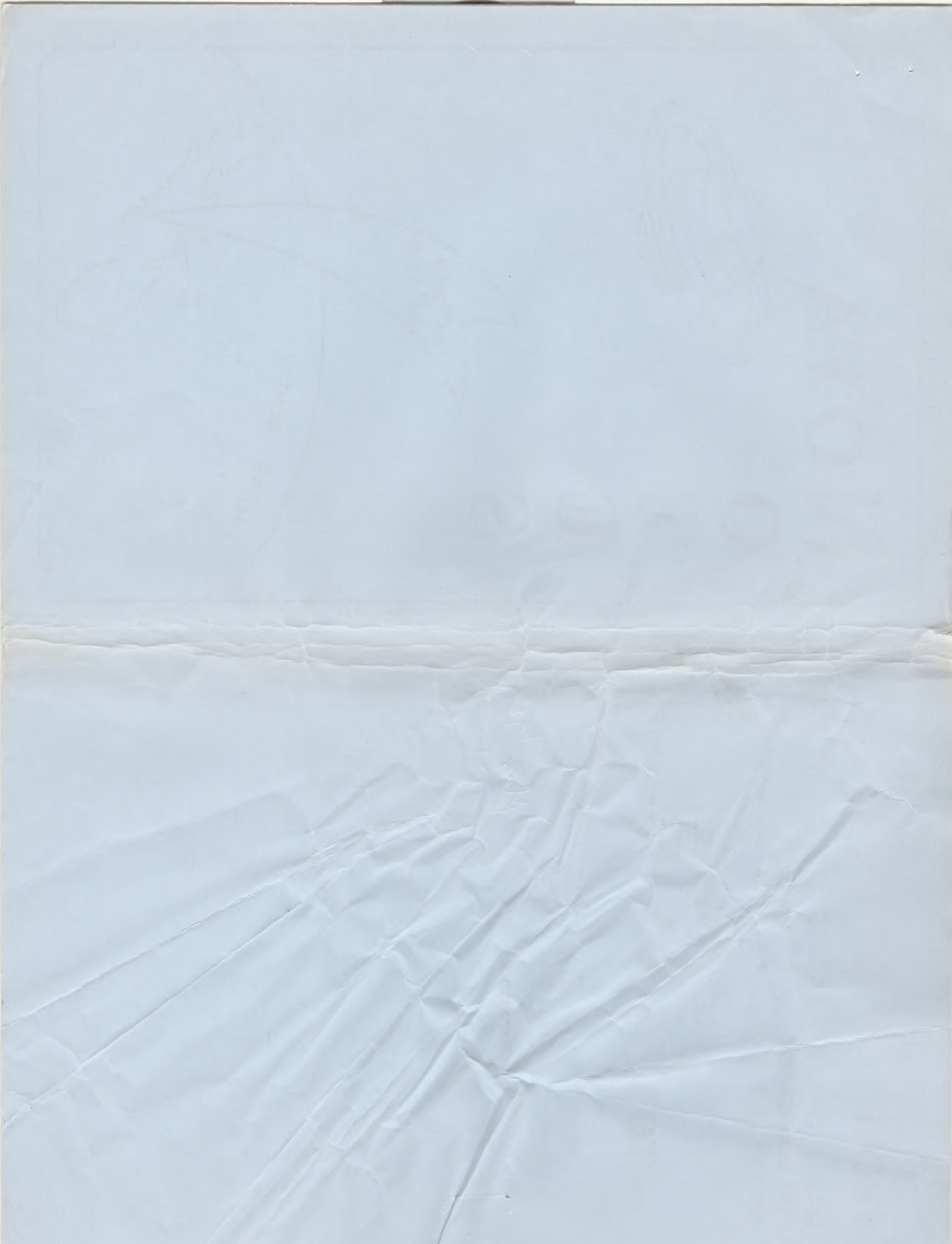
NOVA NOTES



44° 38' N
63° 35' W

HALIFAX
CENTRE





NOTICE OF MEETING

Date: May 19, 1972

Place: The Theatre
Nova Scotia Museum
1747 Summer Street
Halifax, Nova Scotia

Time: 8:00 p.m. sharp

Speaker: Dr. Peter Reynolds of Dalhousie University

Subject: History of the Moon

All members and guests are most welcome

The Nova Notes are printed thanks to the goodwill of

The Nova Scotia Museum

The Monthly Meeting of the Society was held on April 21, 1972.

The speaker was Dr. Henry Bradford from Dalhousie University. He spoke on Radio Astronomy. The topic was well handled and was most interesting. Slides were shown and they proved to be very informative.

Walter Zukauskas thanked Dr. Bradford on behalf of the Society.

Coffee was served while informal discussions continued.

The meeting adjourned at 10:30 p.m.

DEEP RIVER METEOR COUNT

Mary King

A great diamond dipper hangs in a jet black sky. Eight pairs of eyes sweep near its handle - each pair assigned to a sky sector of its own. Eight glowing bodies, snuggled in sleeping bags huddle on deck chairs in a circle facing outward and, when a golden meteor streaks in from outer space a voice drones its sector number, its brilliance and direction. A timekeeper, his eyes on the sweeping second hand crouches in the centre.

Black points on vision's periphery are the tops of jack-pines whose scented boughs are piled with shimmering snow, and all around the land glistening drifts reflect the twinkling stars.

Beyond the trees a snapping, booming frozen river stretches to a wilderness where the cry of wolves splinters the crystal night.

Each upturned face is brittle and exhaled breath hangs for an instant, frosty in the clear cold air. Every eyelash is a gossamer icicle and white rime forms thickly on the cloth beneath each chin.

And every head holds dreams of hot, black fragrant coffee and massive sandwiches replete with juicy meat. But Beauty steals the seconds. Past scintillating stars the golden shower descends and the enchanted watch tells on.

If anyone is interested in going to the National Assembly to be held in Vancouver on May 19 - 22, contact Walter Zukauskas.

Anyone interested in planning an outing with boy cub, scout, or girl guide groups, to explain Astronomy, at the request of such a group, please contact Walter Zukauskas. Assistance in this way would be greatly appreciated.

A special thanks to Dr. Cunningham for contributing some of his "Sky and Telescope" magazines to the Society's library. Members may borrow any of these magazines by getting in touch with Walter Zukauskas.

ASTEROIDS

Gerald Diamond

Between the orbits of Mars and Jupiter lie the Asteroids. The first hint of their existence came with the publication of Bode's Law in 1772. This law gave the distances of the planets from the sun with fair accuracy, but called for the existence of a planet between Mars and Jupiter. None was known. This law gained more credence when Uranus was discovered in 1781 and was found to conform well with Bode's Law.

It was not until New Year's Day, 1801, that Piazzi discovered Ceres, the brightest of the asteroids, as a result of a printer's error on a star chart. Due to the effect of Jupiter's gravitation, Ceres was temporarily lost. During the recovery attempts for Ceres, Pallas was found.

Since then, about a dozen asteroids have been found with diameters larger than a hundred miles. The smallest observed is about a mile in diameter. Approximately 40,000 brighter than magnitude 20 have been found. It is highly probable that they continue down to the size of dust grains, and that their total mass is in the range .2% to 1% of the earth's mass.

Though they lie in a belt, asteroids are more concentrated at some distances than at others and at some distances there are none. These empty gaps are called Kirkwood gaps after their discoverer. They occur at distances where asteroids would have periods $1/2$, $2/5$, or $1/3$ that of Jupiter. They are caused by reinforcing periodic effects of Jupiter's passing.

It seems most likely that Jupiter can take credit for the fact that planetoids are planetoids. It is argued by some that Jupiter's great mass disturbed the motions of nearby gas, dust and small particles and slowed the accretion process. Then, due to various collisions, most of the larger asteroids broke into the omni-sized particles we have today.

For the preponderance of cases, the orbits of these bodies lie in the belts beyond Mars. However, a few have somewhat different orbits. For example, Hidalgo has an eccentricity of 0.66 and makes an angle of 43° with the ecliptic. It travels as far out as Saturn. Icarus has an orbit which brings it within Mercury's orbit. Eros is only 14 million miles from Earth at perihelion, the next approach being in 1975. At these times it reaches magnitude seven. Adonis approaches Earth within a million miles.

The close approaches of these asteroids provide good opportunities for measurement of the Astronomical Unit. The distance of any asteroid or planet measured in Astronomical Units can be found from their observed orbits. The close approaches allow the Astronomical Unit to be given in miles because of the relatively large parallax.

The "Trojan" asteroids provide an example of the so-called three body problem of the famous physicist-mathematician, Lagrange. He stated that if three bodies are at the three vertices of an equilateral triangle, then they form a stable configuration. Recently, fifteen asteroids have been discovered in the "Trojan" positions on either side of Jupiter -- 10 are 60° west and 5 are 60° east. Since only one object can occupy

a point, these asteroids oscillate around the Trojan positions. Their orbits are not entirely stable due to Saturn's influence and it is suspected that periodically some bodies are torn away. It is also suspected that from time to time Jupiter captures asteroids from the belt in these positions.

At the first-ever Asteroid Conference, held at Tucson, various aspects of the asteroid problem were discussed. Among the problems discussed were the composition of the asteroids, the interpretation of their light curves, and meaning of reflection properties at different wavelengths for the asteroids. A report of the Conference was given in Sky & Telescope for July, 1971.

oooooooooooooooooooooooooooo

TELESCOPES

John Shaw has both our admiration and our envy on the completion of his 8" mirror. It has been figured and aluminized, needing only a mount for use. Then he will discover how many relatives, friends and neighbors he has.

oooooooooooooooooooooooooooo

Each year, at the Autumn meeting of the AAVSO, Dr. Owen Gingerich gives his ten highlights in astronomy for the previous year. For the benefit of our armchair astronomers we reproduce these highlights, for Autumn of 1971.

1. The Apollo 15 mission to Hadley Rille on the moon, July 31 - August 2, with astronauts David Scott and James Irwin, showed that the primeval highlands regions of the moon have much more complicated chemical recycling than anticipated.
2. The USSR Venera 7 soft-landed on Venus on December 15th, 1970, telemetered back 20 minutes of data from the Cytherian surface, and disclosed a temperature of $475 \pm 20^{\circ}\text{C}$ and a pressure 90 times greater than at the earth's surface.

3. Princeton's Stratoscope II balloon carried aloft a high-resolution telescope for planetary studies on March 26-27, 1970; the results fore recently announced include an unclouded pure molecular hydrogen atmosphere for Uranus.
4. The Harvard-Smithsonian Reference Atmosphere for the sun, published in July, delineates the temperature structure of the sun with greater precision than before, including a minimum of 4100°C; other work there reveals a plateau at 20,000°C as the temperatures increase outward in the chromosphere.
5. The astonishing discovery of the unstable element promethium in the A-type star HR465, if substantiated, seems to require nuclear reactions and element production at the surface of this star.
6. In the past year radio astronomers have doubled the number of known interstellar molecules, finding new ones at the rate of one a month. The list from September 1970: CH₃OH, CHOOH, NH₂, CHO, CH₃CN, OCS, CS, CH₃C₂H, HNCO, SiO, CH₃CHO, H₂CO, HNC.
7. Speckle interferometry, a brand-new spectrographic-computer technique to unscramble the seeing images of stars, has enabled the 200-inch Hale Telescope to get closer to its theoretical resolution with observations of the diameters of Betelgeuse, Antares, and Aldebaran, and the splitting of the Capella double star system.
8. The nearby Gum Nebula in Vela and Puppis has been recognized as a fossil supernova remnant associated with the Vela pulsar; the explosion dates from approximately 9000 B.C.
9. uhuru (the Swahili word for freedom) is an x-ray satellite launched December 12, 1970; among the many discoveries of this first true x-ray observatory are remarkable rapid pulsations in the source Cygnus X-1.
10. The quasar PKS 2251+11, located in a small compact cluster of galaxies, has been shown by James Guss at Palomar to have the same high red shift as the cluster itself, thus apparently establishing the quasars as remote, cosmological objects.
11. Just for good measure, and of special interest to the AAVSO, are the infra-red observations of Nova Serpentis 1970, which revealed the rapid formation of a circumstellar dust shell about sixty days after the outburst.

A number of comments can be made about these highlights. The "new astronomies" are making an enormous impact on our knowledge of the universe. They are not usurping the role of optical astronomy, but merely giving it its proper role. If an amateur wishes to keep himself informed on astronomy, he must

attempt to follow the new astronomies as well as the old astronomy. In all cases, new and old, the object of astronomy is to shed some light on the universe.

00000000000000

SOME MESSIER OBJECTS

The Observer's Handbook lists the Messier Catalogue. Most of the objects are easy to find and make a rewarding piece of work. Finding some of them for the first time can be quite a chore, but once found become easy objects. The moral is find them first, then bring your friends around another evening.

Auriga contains three Messier open clusters, M36, M37, and M38. All are moderately compact, and easy to find.

In the early evening sky Taurus is slipping toward the west. His shoulder is marked by the open cluster M45, known in some circles as the Pleiades. The question inevitably asked is how many members can be seen by the naked eye. Well, how many can be seen? The ancients called them Seven Sisters. Are there seven? Are they sisters? The blue-white hue of the brightest members is caused by their high surfact temperatures. This blue color is characteristic of clusters which are young. At the old end of the evolutionary trail is the supernova remnant, M1, also found in Taurus. This bizarre object is the famous Crab Nebula. It is found only a short distance from zeta Tauri, the star which marks the tip of the Bull's more southerly horn. It is a ghostly, compact image in a small telescope. It is worth seeing. In fact if you were built right, you could examine it in x-ray, ultraviolet, visual,

infra-red, and microwave and radio wavelengths. It is the wreckage of a supernova, it is a pulsar, it may be a producer of cosmic rays. It is stupendous. Don't miss the greatest show on

000000000000000000000000

A number of constellations which are often regarded as for southern observers only really are visible even here in Nova Scotia. Star Maps 1 and 4 in the Observer's Handbook show that Eridanus, Lepus and Puppis are easily visible in the winter sky. Additionally, Fornax, Caelum, Columba are theoretically visible. Their appearance will be governed ultimately by the horizon you have available and the haziness of the sky. An interesting observation is to determine how many magnitudes are lost in going from the zenith to the horizon. Near the horizon, the brightest stars only will be visible and the Handbook provides a valuable list of magnitudes for the brightest stars.