

THE ROYAL ASTRONOMICAL SOCIETY OF CANADA



SASKATOON CENTRE

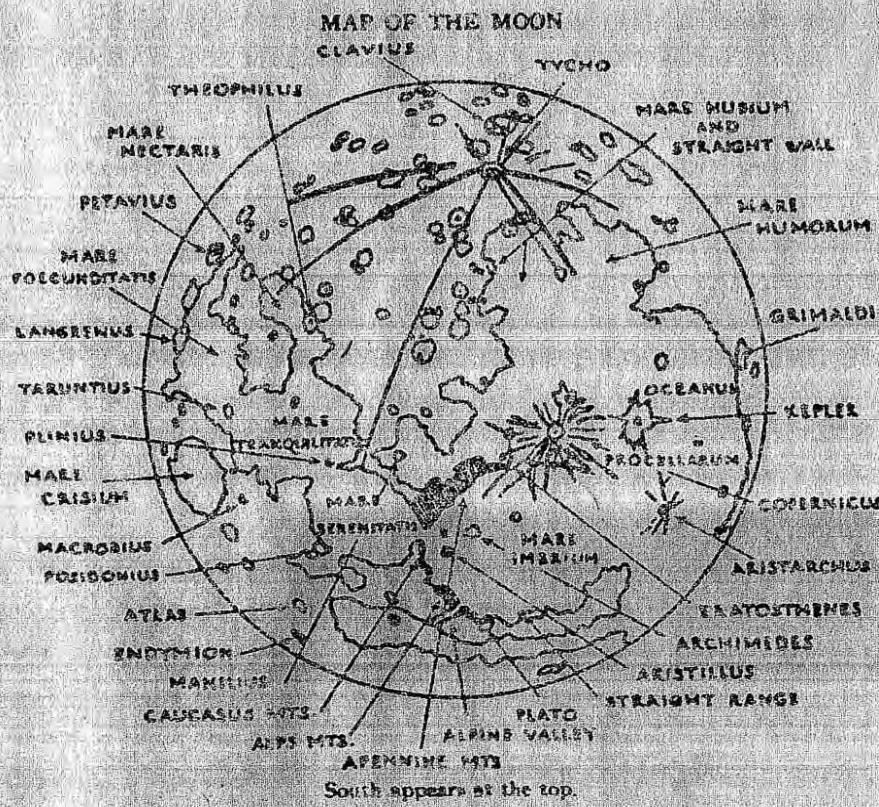
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NEWSLETTER



THE VIKING SPACECRAFT (Michael Wesolowski)

Last August and September, two identical spacecraft called Viking were launched. Their objective: Mars. Each spacecraft is a combination orbiter-lander. The prime objective of this mission is to determine whether Mars has life. If all goes well, we'll know this summer.

THE ORBITER - Although the lander will be given most of the publicity, the orbiter is essential to the success of the mission. It must observe the proposed landing sites and decide whether they are safe.

The orbiter's design is based on the successful Mariner series of spacecraft. Originally, a scaled up Mariner-9 was to be used, but increased fuel requirements and differing scientific objectives dictated a change in design. (The orbiter and lander together weigh almost 4 tons)

Like Mariner, Viking is built around a basic bus structure. Sixteen equipment bays containing all electrical systems are built around this basic structure. Other parts of the orbiter (solar panels, antennas) are appendages to this structure.

As was said earlier, the orbiter must make sure the landing sites are safe and scientifically interesting; in other words, there must be a good chance of finding life.

Any sort of life would probably be near water. An atmospheric water detector on each orbiter will examine the atmosphere at infrared wavelengths in an attempt to detect water vapor. Finding water vapor will increase the probability of finding water on the surface.

The landing sites should also be warm, therefore, each orbiter has an infrared thermal mapper (IRTM) to provide information on atmospheric and surface temperatures.

Two television cameras on each orbiter will examine the landing sites. Filter wheels will admit either unfiltered light or that ranging from 1600 to 6500 Angstroms.

After the information has been gathered, a decision will be made on Earth and the lander will deboost and land at one of the two possible sites.

THE LANDER - The lander has devices for studying Martian geology, soil and atmospheric composition, meteorology and seismology. Each lander has two high resolution color cameras and a soil sampler. The three life detection experiments will settle the centuries old question of whether there is life on Mars.

The lander will be in darkness for half of the Martian day, and even then will receive only half as much sunlight as it would on Earth. Solar cells as a power source are therefore quite impractical. Radioisotope thermoelectric generators, having proven their worth on Pioneers 10 and 11, were chosen as the power source for the lander. Heat produced by the decay of plutonium 238 is converted into electricity while excess heat is channeled into the interior.

The two facsimile cameras will be able to view the whole circumference of the landing site. Unlike ordinary cameras, which take pictures in a fraction of a second, these cameras may take up to two minutes for one picture. (remember, the lander is a stationary object) Light is reflected into the camera by a mirror which moves in altitude while the camera body moves in azimuth. Hence, the term "facsimile".

LIFE DETECTION EXPERIMENT - After the soil sampler has a sample, it may deposit it in one of two soil analysis experiments, or in the biology inlet. Here it will be tested for the presence of life. Within a cubic foot of space are packed three different experiments, two of them using carbon-14 as a label.

Pyrolytic Release Experiment - The soil sample is incubated in a Martian atmosphere containing CO₂ and CO, labeled with C-14. At the end of five days, the atmosphere is removed and the chamber heated to 625 °C. Any organisms will be vaporized and the gases are then passed through detectors that will identify any C-14 that has been absorbed by the organisms.

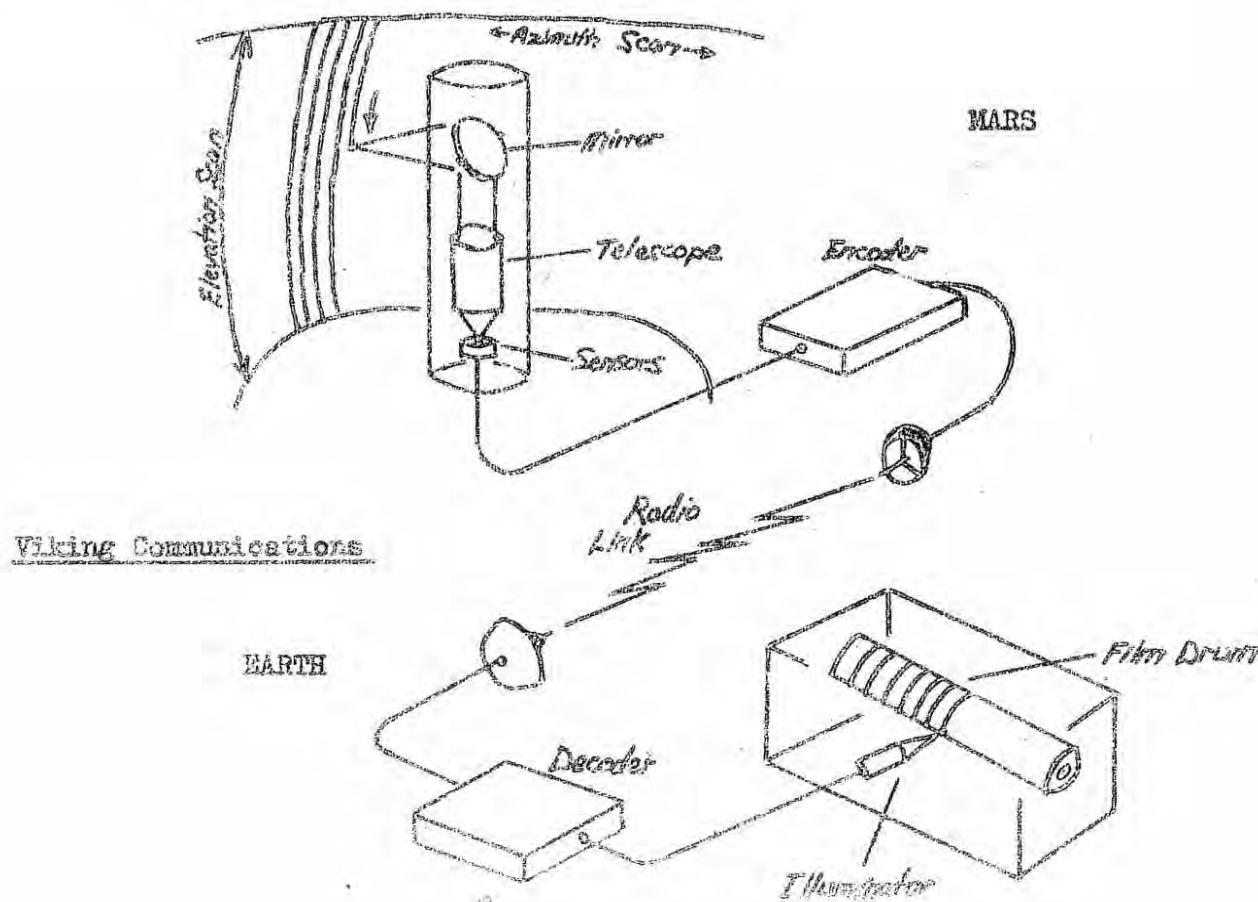
Labeled Release Experiment - Every living organism takes in compounds to support its life and give off some sort of waste product (forget the "Andromeda Strain"). In this experiment, the sample is immersed in a nutrient solution labeled with C-14. After several days, any gaseous wastes (labeled with C-14) will be detectable.

Gas Exchange Experiment - Every living organism alters its environment as a result of its being alive (plants take in CO₂ and the waste product is oxygen). The sample is immersed in a nutrient solution and incubated for several days in an atmosphere of helium, krypton and CO₂. Every few days, the atmosphere is tested for molecular hydrogen, nitrogen, oxygen, methane and CO₂.

After the experiments have been made, each scientist examines the data from his experiment and compares it with the other scientists. They then decide whether the experiments indicate life. Presumably, the public is informed if there is life, and some nut gets a "War of the Worlds" complex.

The first closeup pictures of Mars sent by the early Mariners shattered quite a few theories. How many theories will be destroyed by Viking?

Viking is just the beginning. Within a few years, we may be putting a lander on Mercury, and duplicate the Russian achievement a few months back. Planetary astronomy is entering a new era.



SASKATOON CENTRE FOURTH ANNUAL PICNIC AND STAR NIGHT

Once again the Saskatoon Centre will be hosting a picnic and "Star Night" at Diefenbaker Park in Saskatoon. The picnic, which will start at 6:30 pm, is reserved for members of the Saskatoon Centre, and family and friends of members. The Star Night will begin at 8:30 pm and is open to the general public.

Rather than just having telescopes set up, looking at various objects in random order, this year we are going at it in a much more organized fashion. There will be about ten telescopes set up and each one will look at only one or two specific objects for the entire night. In this way, the public will be assured of seeing several different objects. Each person manning a telescope will be responsible for a general idea of what the object type is, its history, if any and general facts on it. In other words, he or she must be able to answer any questions the public might have.

Pretty well all telescopes are manned, and object-telescope combinations are being worked out, however, we need guides to show people from telescope to telescope. If anyone would like to offer their services as a guide or even the use of their telescope and themself to man it, come to the Saturday 17 July Astro-photography meeting at GN Patterson's home at 79 Baldwin Cres., 8:00 pm. If this is not possible, contact an executive member. Please note that this outing will take the place of the July General Meeting, and as such, we would expect all those who attend General Meetings to be at this outing, along with many other members and their family and friends.

All those planning on coming should bring:

- a.) their telescopes, binoculars and cameras
- b.) flashlight, preferably with red screen
- c.) Their own hot dogs, soft drinks, etc.
- d.) lawn chairs, bats, balls and gloves
- e.) family and friends

REMEMBER -- DATE = Friday 30 July 76 or if cloudy Saturday 31 July

TIME - Picnic: 6:30 pm to 8:30 pm

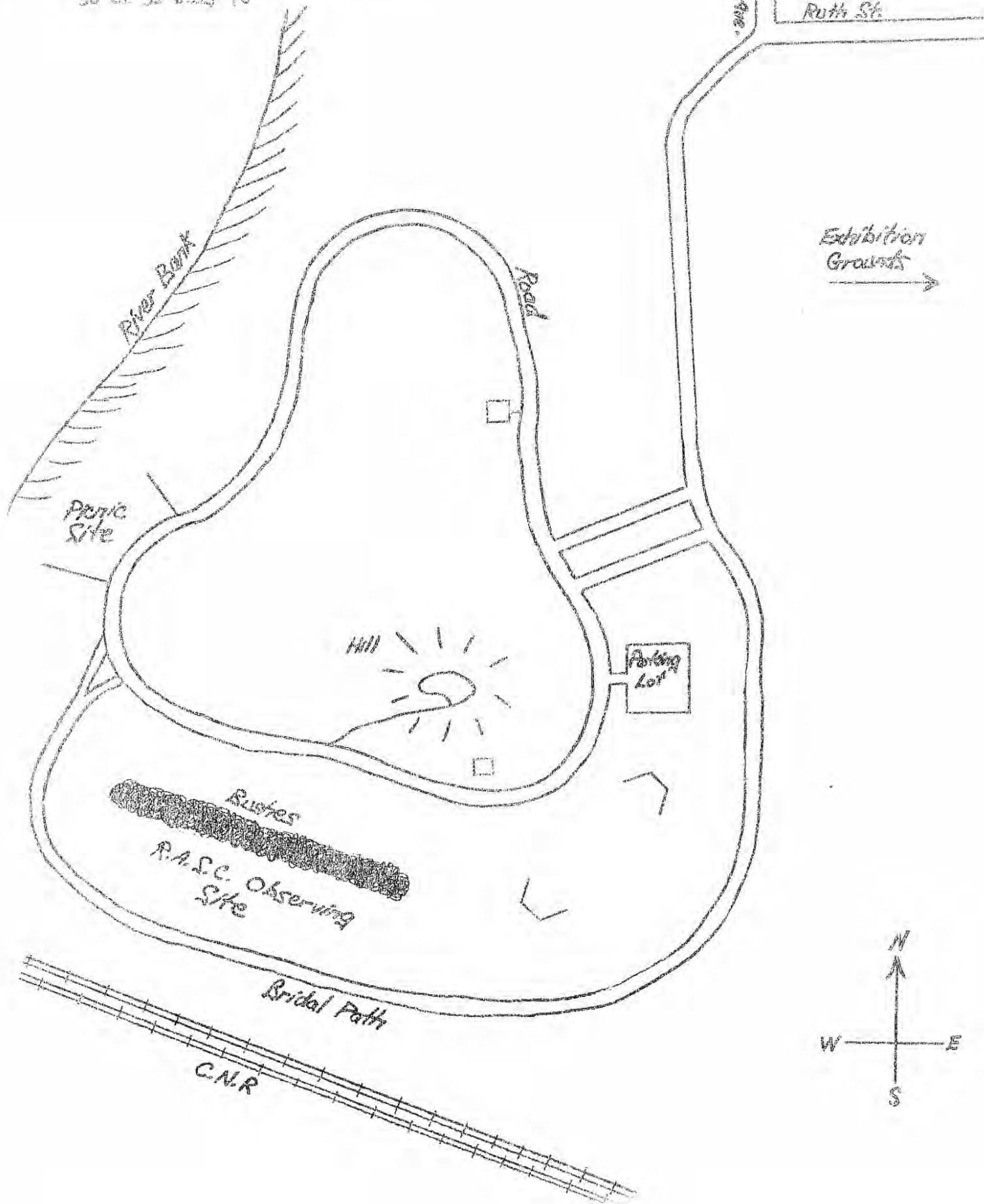
Star Night: 8:30 pm to ???

PLACE - Diefenbaker Park (west of exhibition grounds along riverbank) See map following page

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REEDMANGER PARK

RASC picnic and "Star Night" site,
30 or 31 July 1976



THE BELTS AND ZONES OF JUPITER

David Piatupa
Saskatoon Centre, RASC

The Author - David is 18 years old and has recently completed his grade 12 at Mount Royal Collegiate in Saskatoon. He has been interested in astronomy since he was very young and joined the Saskatoon Centre in 1970 - about the time the Centre was being formed. He owns an equatorially mounted 2.4 inch refractor and has used it for both observing and astrophotography. His other interests include radio and terrestrial photography.

THE NORTH POLAR REGION

The North Polar Region is the hood that covers Jupiter's pole and extends down to 48 degrees. This region is a dull, featureless area of Jupiter although a few white spots do appear which can be used to measure the rotation period of the area. The mean rotation period is 9h.55m.42s.

THE NORTH, NORTH TEMPERATE BELT AND ZONE

These areas are generally obscured by Polar shading and is fragmented, rather than being one solid band. At times one half of the belt is white while the other half is dark giving a high contrast between the two. Sometimes it has many types of rich detail.

THE NORTH TEMPERATE BELT AND ZONE

This area can be the brightest area on the planet at times and varies in width. The belt is brownish-purple and sometimes blue-grey.

THE NORTH TROPICAL ZONE

The brightness of this zone is variable and can be very bright. It contains many spots and in 1942 and 1943 a straight dark line crossed through the middle of the zone.

THE NORTH EQUATORIAL BELT

This belt is very active and there are always several dark spots visible on it. The belt's width can be very wide or shrink to a thin line, however, it is always very conspicuous.

THE EQUATORIAL ZONE

This zone has a thin line passing through the middle known as the Equatorial Belt and is usually in fragments. Although it appears to be in the middle it is actually one degree off the true equator. The zone itself is white when at its brightest and when dark can be almost any hue.

BOOK REVIEW by K.P. Atchison: The Stars Belong to Everyone by Dr. Helen Sawyer Hogg

Of all natural phenomena, the heavens are one of the most beautiful and universal. They offer unique and fascinating entertainment to those who bother to appreciate their presence. Such appreciation can be achieved simply through the use of ones own eyes together with a basic understanding of astronomy. This is the purpose of Dr. Hogg's recent book The Stars Belong to Everyone - to indicate to the lay person what to look for, how to identify it and what the object is in the night sky. Of these objects, Dr. Hogg deals with several; from meteors, noctilucent clouds, aurora to the brightest stars, planets, variables, galaxies, binary stars, gaseous nebulae, star clusters and even such exotic phenomena as neutron stars and black holes.

The Stars Belong to Everyone is in no way a text book, but simply a guide that might help one enjoy astronomy; in the words of the author "The magnificence of nature is all around - and above us. I hope this book will add to your enjoyment of it." (pg. viii)

Dr. Hogg goes about handling the complexity of astronomy in a logical and simplified manner. She begins the book with explanations about how the earth's atmosphere is responsible for such effects as the twinkling of stars, twilight and even the rare green flash on the sun. Her explanations are straightforward and lack the complexity that one might expect from an astronomy book. Take, for example, her explanation of why stars twinkle:

"You have doubtless observed this same sort of tremor with objects on earth when you look out a window over a hot radiator and see the heat waves distort the objects or landscape you are looking at. Or you may have noticed it over a highway on a hot sunny day. This effect can be even more pronounced and lead to a mirage. Curvature of the rays in layers of hot and cold air causes this distortion. On a much larger scale, this same curvature causes the position of a star to change ever so slightly, while the rays of light that have been displaced come together in uneven amounts, sometimes making the star bright and sometimes appearing to make it fade out completely." (pg. 7)

By relating the causes of star glitter to such down to earth phenomena as that caused by a hot radiator or pavement, Dr. Hogg is able to place the reader on familiar ground and make it easier for that person to grasp the concept being explained. This technique, combined with relatively short, concise sentences were used throughout the book thus making it understandable for a reader who has had no previous experience with astronomy.

All the chapters have been written in a logical progression. She proceeds from chapter one to a description of atmospheric occurrences such as aurora, meteors and others, and then moves on to discuss the moon, sun, eclipses, planets, comets

and the many types of stars. She ends her work with a description of galaxies and some theories about the origin of the universe.

It is apparent that Dr. Hogg moves from the area of the earth and then gradually on to the galaxies. In this way she moves from familiar to less familiar while building concept upon concept which helps to make her book easier for the beginning astronomer to understand.

Although Dr. Hogg has tried to make her book readable for the layperson (she has been rather successful at it) there are instances where she could not avoid introducing relatively complex astronomical concepts. Consider her references to the origins of the universe:

"The Big Bang model of the universe, favored by physicist George Gamow, starts with a primordial fireball of incredibly high density (Ylem) at some time in the past." (pg. 255)

Dr. Hogg goes on to explain a little more about this theory and others. What she states is all quite understandable, but here, as in previous instances throughout the book, several questions arise in the reader's mind that are not answered by the author's explanations. This is not bad, however, for it encourages the reader to look into the topic under question in greater detail, possibly by reading other books.

In the final analysis we realize that Dr. Hogg has been quite successful in writing a book whose purpose is to encourage an interest for the night sky in non-astronomers. She does not fail to mention objects of interest and where they are in the sky. Her book is filled with fascinating facts, theories and some history of astronomy. The Stars Belong to Everyone is a well organized, comprehensive account of astronomy; truly the type of book I would recommend to someone who wishes to be introduced to this fascinating science. The title of Dr. Hogg's book is also quite accurate, for of all natural phenomena the stars are the only one that all mankind holds in common.

- 1 July 1976

Publication Date - 14 May 1976

Price - 12.50

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On Wednesday 16 June at about 11:00 pm I noticed a large sheet of shining silvery-white clouds directly to the north. I thought they might be noctilucent but I dismissed them as cirrus, as there was a good deal of twilight. Unfortunately, I had never seen noctilucent clouds before this, and did not know what to look for. The next day I received a phone call from Robert McAllister, asking me if I saw the noctilucent clouds the night before. Remembering what I saw, I replied yes, now realizing that they were definitely noctilucent. He also told me that they persisted for 2 or 3 hours, which further confirmed them as noctilucent. I then wished that I had taken slides, as it was a fairly extensive, bright and beautiful display. Some of you may also have seen the report of their presence on the weather portion of the Thursday 17 June edition of CFQC-TV News, as they often persist for several nights.

At the Saturday 19 June Astrophotography Meeting at GN Patterson's many members saw another display, although not near as extensive as the one on the previous Wednesday. We did take colour slides, however. Doug Beck and Gordon Patterson also reported some on Wednesday 23 June. I also saw a brief display on Tuesday 6 July just after 11:00 pm and took slides of it.

All members are urged to keep a lookout for them and to take photographs if possible. See Dr BW Curries' article in the March 76 Newsletter for more details on them.

MINUTES OF A GENERAL MEETING, SASKATOON CENTRE, RASC,
HELD IN ROOM B-110, HEALTH SCIENCES BUILDING, U of S, 8:00 PM, 5 JUNE 76

Present:

Halyna Kornuta..... President
 Mr Jim Young..... Vice President
 Mr GN Patterson..... Centre Rep.
 Mr Hugh Hunter..... Librarian

Mrs Lillia Wilcox.. Secretary
 Mr Merlyn Melby... Activities
 Doug Beck..... Councillor
 Greg Towsiego.... Editor

Absent:

Mr Alan Blackwall.... Treasurer

Minute	Subject	Action
104.	Meeting called to order at 8:00 pm	H. Kornuta
105.	Moved that the May minutes be adopted as published. Carried	Kevin Atchison Wendel Frenzel
106.	\$32.00 has been received from the sale of articles to the public in the Observatory.	H. Kornuta
107.	Refreshments are not going to be sold to the public in the University Observatory.	Wendel Frenzel
108.	Requested by Prof. Kennedy that pamphlets distributed to the Centres not be sold to the public.	H. Kornuta

Minute	Subject	Action
109.	A summary of the General Assembly was given. A discussion on the future of the Centre followed.	GN Patterson
110.	The annual July picnic and outing will be held at Diefenbaker Park on Fri., 30 July or if cloudy on Sat., 31 July. Members will bring own food.	Marilyn Melby
111.	Parks Dept. will be notified prior to outing for mosquito fogging.	Ron Waldron
112.	The annual outing to be held at Auckland farm will have a society sponsored picnic.	H. Kornuta
113.	Mr. Gerald Borrowman spoke on Russian Manned Space Flight Programs, followed by slides and a question period.	
114.	Meeting adjourned to Observatory - 10:15 pm.	Kevin Atchison Ron Waldron

THE ROYAL ASTRONOMICAL SOCIETY 1968
SASKATOON CENTRE

MEETING NOTICE

Place South Side of Diefenbaker Park

Date Fri, July 30, or if bad weather, on 31st

Time 6:30 p.m.

Purpose Annual Picnic, starting at 6:30 pm.

Star Night for Public, starting at 8:30pm.

Bring your own lunch & telescopes, etc.

MINUTES OF AN EXECUTIVE MEETING, SASKATOON CENTRE, RASC,
HELD IN ROOM B-110, HEALTH SCIENCES BUILDING, U of S, 10:20 PM, JUNE 76

Present:

Halyna Kornuta..... President
Mr Jim Young..... Vice President
Mr GN Patterson..... Centre Rep.
Mr Hugh Hunter..... Librarian

Mrs Lillia Wilcock.. Secretary
Mr Marilyn Melby.... Activities
Doug Beck..... Councillor
Greg Towstego..... Editor

Absent:

Mr Alan Blackwell..... Treasurer

Minute	Subject	Action
115.	The Executive is to meet at GN Patterson's residence on Sat. 10 July to discuss the Diefenbaker Park outing.	H. Kornuta
116.	Meeting adjourned to Observatory - 10:25 pm.	Marilyn Melby