THE ROYAL ASTRONOMICAL SOCIETY OF CANADA

SASKATOON CENTRE

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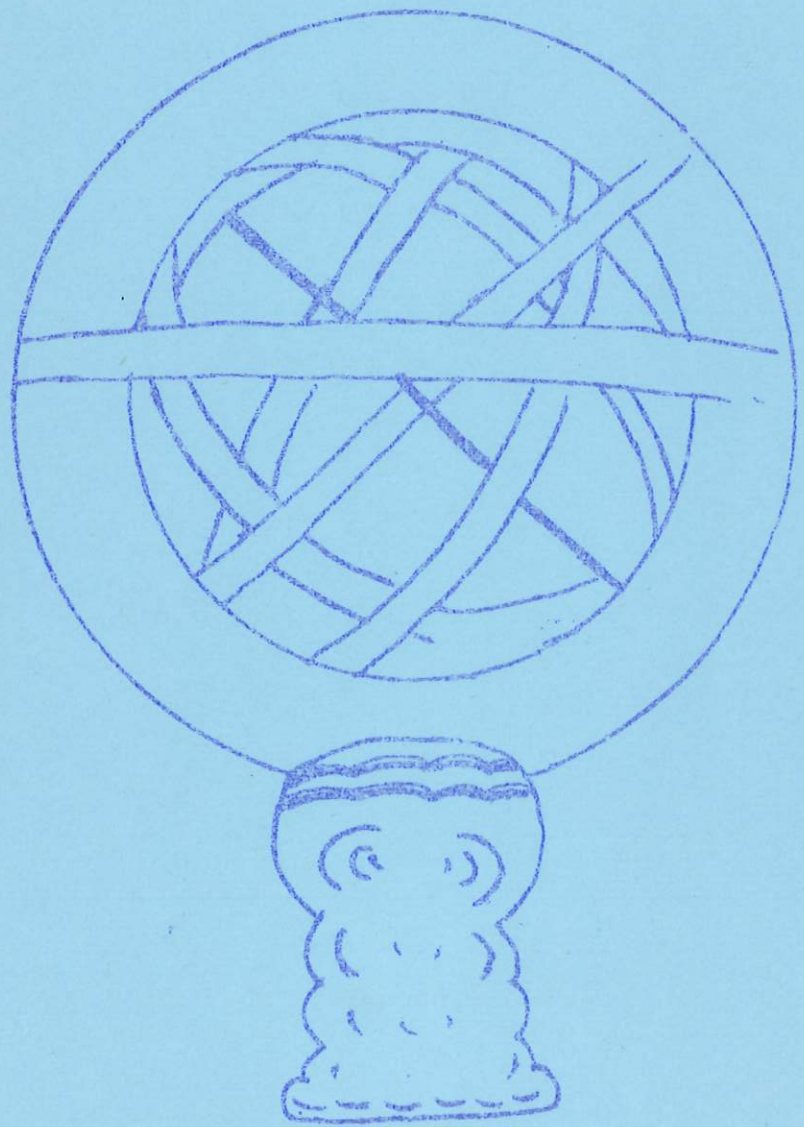
News Letter



In order to apply the title of astronomer to the first man in the history of science to earn such distinction, one must furnish basic qualifications. An astronomer is a scientist who devotes the major portion of his time to careful study, systematic observation, the discussion and interpretation of such facts as he or others may establish and to the formation of theories that seem to rationalize his observations.

The Greeks were people of a strong philosophical trend of mind. They were interested first of all in the interpretation of the world about them on a geometrical basis. Among the Greeks are many names of importance, including Thales of Miletus, a philosopher who held that the Earth is spherical and that stars shine by their own light and he also predicted several eclipses with some accuracy. Pythagoras, better known as a geometer, thought that the Earth revolved about the Sun. Eratosthenes devised a method for determining the size of the Earth, which he held to be spherical; Aristarchus of Samos developed a heliocentric hypothesis for the relationship of Earth and Sun and also applied a geometrical method for the determination of the diameters and distances of the Sun and Moon. But not one of the aforementioned made systematic or painstaking observations; not one interpreted his observations to any considerable degree. To find a man who deserves the title of first astronomer, we must turn to Hipparchus.

Hipparchus of Nicaea lived in the second century B.C., Little is known of his life and of his writings only one has been preserved though there are many references in other works. At his observatory on the Aegean Sea island of Rhodes he performed his research and observations with the best instruments of his time, although at some time he probably visited Alexandria, the cultural center of the ancient world. Our knowledge of his work appears in the statements of his admirer Ptolemy of Alexandria, later himself to gain fame as an astronomer of note.

Among Hipparchus' many achievements one occured when he attempted to measure the size of the sun and moon and their distance from the Earth. He felt the need for a type of mathematics that, by applying measurements made on Earth, it would enable him to measure objects far out in space (he later estimated the distance between earth and moon as 60 times the radius of the earth.) Hipparchus then developed trigonometry which continued to aid him in his work. A summary of his other contributions may be grouped under four separate headings.

First, his scheme of motions, which he applied with some degree of success to the sun and moon. Associated with this were his observations in connection with the length of the year, his preparation of solar tables (the first of their kind), his careful observations of the sun and moon, and his improvement of the

method of predicting eclipses. Hipparchus apparently attempted to apply his scheme of motions of the planets also, but without success; consequently he contented himself with taking a long series of observations of these bodies and left to some future worker the task of their interpretations.

Secondly, having noted the sudden appearance of a star in a position where before there had not been one visible, Hipparchus conceived the idea of making a star catalogue and carried it into effect. This catalogue gave the positions of the stars referred to a definite co-ordinate system and all of the 1,080 stars in it were classified into six gradations of brightness (the beginning of our modern system of visual magnitudes.)

Thirdly, it must be noted that Hipparchus had formed the practice of comparing his own observations with those of previous observers. To his surprise he found a progressive change in the distances of the stars from the equinoctial points, all of them having increased in celestial longitude while the latitudes remained unchanged. He concluded that a change of reference point in his system of co-ordinates had taken place and he was the first to recognize the very remarkable astronomical phenomenon known to us as the precession of the equinoxes.

Finally, he took careful observations of all possible astronomical events and phenomena.

Laboring under extreme difficulties, without good instruments, Hipparchus produced results which are truly amazing. He was a man of learning and accomplishment in his field, and he was the first who devoted his life to careful study and systematic observation of the heavenly bodies and attempted interpretations of what he saw. Hipparchus ranks above his predecessors in this field and is rightly to be regarded as the first real astronomer.

GENERAL MEETING

DATE: Tuesday, May 21, 1974

TIME: 8:00 p.m.

PLACE: Room B110, Health Sciences Bldg
(across from Observatory)

PROGRAM: Regular Business

Film: A View of the Sky

- that all four of the Soviet probes launched to Mars last summer have failed. Mars 4 and 5 arrived at the end of February but Mars 4's braking engine failed to fire and it passed by the planet at a distance of some 1600 miles taking photographs, but unable to do much else. Mars 5 did go into elliptical orbit but so far no details have been released. Mars 6 released its descent module but then moved away from the planet into heliocentric orbit. Meanwhile, Mars 7 like 4, just flew past the planet at a distance of some 650 miles. The descent module's radio ceased to function before it had even reached the surface, though it did detect a magnetic field in the planet's environment some seven to ten times greater than in interplanetary space.

- that from the recent Venus flyby, it is assumed that Venus is a planet with past and recent volcanic activity. In analogy with other planetary objects such as the moon and Mars the Venusian crust is believed to be heterogeneous and the relief seems to be volcanic and volcanic sedimentary. The most probable processes are of lava formation, weathering, wind erosion and deflation. Among the terrestrial planets, Venus is the single planet whose physical characteristics (such as mass, size, density, etc.) are similar or near to Earth's parameters. It would seem therefore that also the evolutionary stage would be similar to that of Earth. It is now known that to draw such a conclusion would be highly eroneous. The former opinion that Venus is a sister-planet of Earth is far from reality. Venus when compared with the Earth and its complex organizational structure, is a less developed body. It probably takes some intermediate position between Mars and Earth.

- that the ultraviolet camera carried by a NASA Aerobee Rocket snapped a unique picture of Comet Kohoutek. After analysing it and other photos it was reported that the spherical image in the picture was a huge cloud of hydrogen (three times the diameter of the sun) completely enveloping the head and most of the tail of the visible comet. Some of the hydrogen appears to be blown away by the sun to form a tenuous cloud behind the comet which is many millions of miles across. Space scientists believe that the comet consists largely of water ice, in which are embedded dust and other ices. As the water evaporates when the comet nears the sun, the action of sunlight breaks it up into its component hydrogen and oxygen atoms. The lighter hydrogen atoms escape rapidly producing the extensive cloud. The first evidence of water molecules in a comet was discovered on Kohoutek by two Canadian scientists. This is one of the most important findings thus far and it reinforces the belief that Kohoutek is, scientifically speaking, the most important comet since Halley's. Here is how the data was obtained: As Kohoutek moved toward the sun, it was heated and the ice in its center layers turned to water vapor or steam. Then solar radiation ionized the water vapor molecules, causing them to lose electrons and gain a positive electric charge. Once the molecules were charged the solar wind (plasma particles that constantly stream away from the sun) pushed the molecules back away from the sun and into the tail of the comet. At this point the molecules produced red light observed by telescopes and spectrographs.

MINUTES OF THE GENERAL MEETING
Saskatoon Centre, R.A.S.C.
Held in the Health Sciences Building
April 16, 1974, 8:00 p.m.

Present:
Wendel Frenzel, President — Ron Waldron, VP/PR
Melodie Andrews, Secretary — Hugh Hunter, Librarian
Milton Phenneger, Programming — Gordon Patterson, Activities

Absent:
Alan Blackwell, Treasurer — Halyna Kornuta, Editor

Item	Detail	Action
47.	The meeting was opened.	
48.	Adoption of March Minutes. H. Hunter, G. Patterson. CARRIED	
49.	The cost of the trip to Winnipeg for the General Assembly was discussed: Registration $10.00 (includes reception, festival, banquet) Accommodation Residence at the university Single room $35.40 Double room $32.40/person Full amount to be paid by June 1, 1974. Transportation: Air $84.00 — Car sharing expenses for Rail $45.00 — 1040 miles--approx. $10 Bus $37.00 — to $15 per person.	
50.	The film presented was Space Navigation.	
51.	The meeting was adjourned to the observatory. CARRIED	D. Beck R. Waldron

MINUTES OF THE EXECUTIVE MEETING
Saskatoon Centre, R.A.S.C.
Heldiin the Observatory, 7:30 p.m., April 30, 1974

Present:
Wendel Frenzel, President — E. A. Hoiken, Centre Representative
Melodie Andrews, Secretary — Gordon Patterson, Activities
Halyna Kornuta, Editor — Hugh Hunter, Library
Ron Waldron, VP/PR

Absent:
Milton Phenneger, Programming — Alan Blackwell, Treasurer

52.	The meeting was opened.	
53.	Four new members have joined this Centre.	
54.	Those planning to attend the General Assembly discussed the trip and Accommodations.	
55.	The restrictions of the telephone was discussed.	
56.	The meeting was adjourned.	R. Waldron H. Hunter