

NOVA NOTES

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Peopled



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they want

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Halifax Centre



May-June 1984
Volume 15
Number 3

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NOTICE OF MEETINGS

Date: Friday, May 18th : 7:00 P.M.

Place: The Clinper II Restaurant
Dartmouth Ferry Terminal
Parking is available adjacent to the
terminal building

Topic: ANNUAL BANQUET
see inside for more details

Date: Friday, June 15th : 8:00 P.M.

Place: Nova Scotia Museum: Meeting to be held
in the lower theatre. Access from park-
ing lot and side entrance.

Speaker: Mr. Larry Bogan will be our speaker for
this month's meeting. His lecture is
entitled "Titan's Ocean : An Interesting
Detective Story" which will look at the
latest theories about what the surface
of Titan is like, and how these theories
were developed.

REFRESHMENTS WILL FOLLOW THE JUNE MEETING !!

Please note that this list is tentative
and subject to change.

About the cover: This advertisement from an 1893
Chicago newspaper reflects some of the public
interest which centered on the opening of the
one metre refractor at Yerkes Observatory.

Miscellaneous Notices

ANNUAL BANQUET

The 1984 Halifax Centre Annual Banquet will be held on Friday, May 18th at 7:00 with the meal scheduled to commence at 7:30. The location this year is the Clipper II Restaurant in the Dartmouth Ferry Terminal. We will have a private room with a view of Halifax Harbour, a full meal with wine and all drinks from the bar at "happy hour" prices. Tickets are \$15.00 per person and may be obtained from the Treasurer. It promises to be a great time so make plans to attend.

NEW TIME FOR L.C.A.C. MEETINGS

Due to new hours at the DesBrisay Museum, meetings of the Lunenburg County Astronomy Club will now be held at 7:30 P.M. on the third Saturday of each month at the DesBrisay Museum in Bridgewater. Also note that the meetings to be held in March, June, October and December will be especially for the public and all are welcome.

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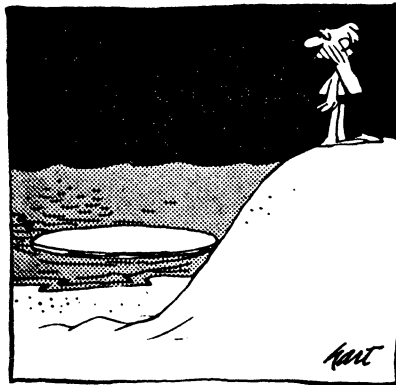
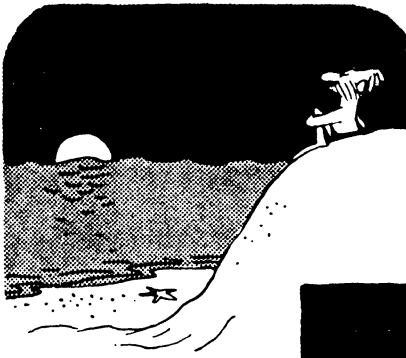
As a result of a communications mix-up between myself, the printers and the museum, the cartoons which should have appeared on the blank pages in the last issue were inadvertently not printed. They are reproduced in this issue and I trust that they were worth the wait.

ASTRONOMY DAY

This year Astronomy Day falls on Saturday, May 5th. We will be "celebrating" Astronomy Day this year with an exhibit at the Sir James Dunn Building on the Dalhousie University campus. The afternoon session, running from 2:00 to 4:00 P.M. will feature solar observing (weather permitting) and planetarium shows in the Halifax Planetarium. There will also be an evening session from 8:30 to 10:30 with observing (again, weather permitting) and more planetarium shows. There are sure to be other interesting things going on as well so bring your telescope and friends.



Reprinted from "Hey, B.C."



Reprinted from " B.C. One More Time "

1984 MEMBERSHIP LIST OF THE HALIFAX CENTRE

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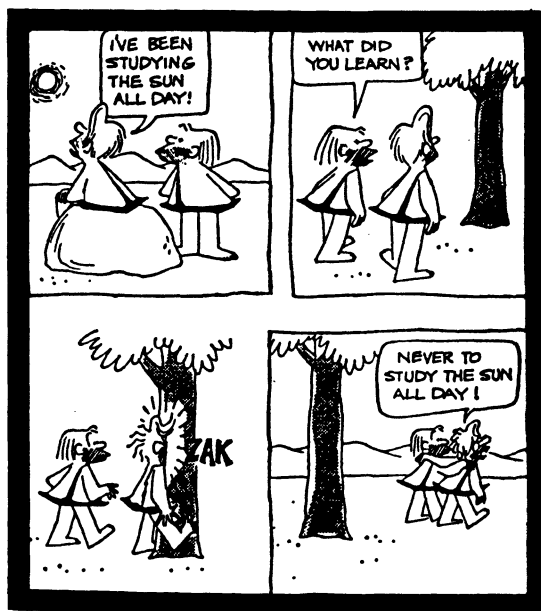
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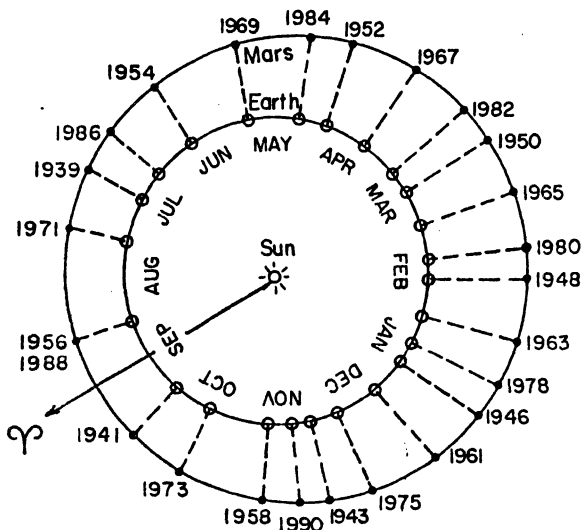
Reprinted from " Hey ! B.C. "

MARS OPPOSITION--MAY 1984

"....We saw how badly off for water Mars, to all appearance, is; so badly off that inhabitants of that other world would have to irrigate to live. As to the actual presence there of such folk, the broad physical characteristics of the Planet express no opinion beyond the silence of consent, but they have something very vital to say about the conditions under which alone their life could be led. They show that these conditions must be such that in the Martian mind there would be one question perpetually paramount to all local labour, women's suffrage, and Eastern questions put together--the water question. How to procure water enough to support life would be the great communal problem of the day."

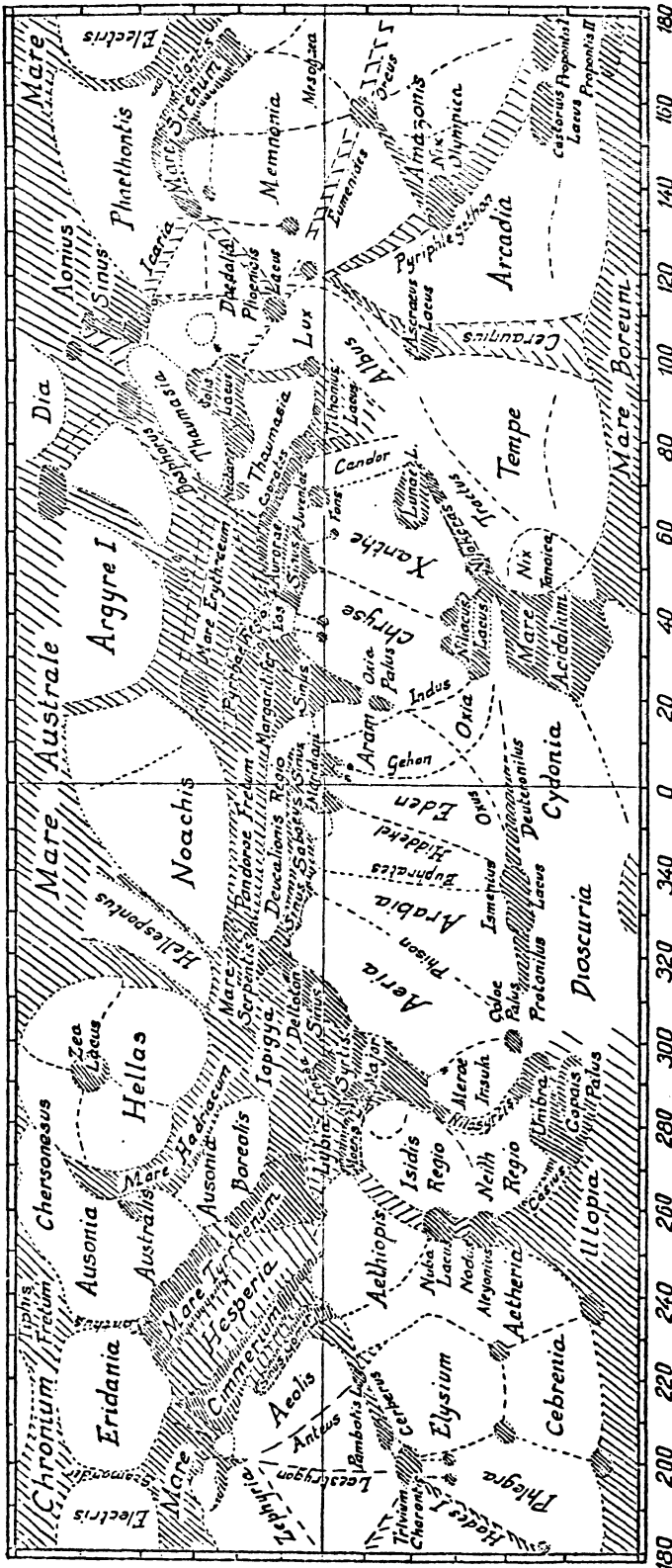
That was how Percival Lowell opened his chapter on the Martian canals in his 1895 book Mars. Well, we've certainly come a long way in understanding that the canals he saw were caused by the way our brain analyzes patterns of faint closely spaced features. Indeed, a single photo from the Vikings spacecraft may reveal more about the physical conditions on Mars than Lowell learned in his entire life of Martian studies. This month you have an excellent opportunity to observe Mars in the same manner as Lowell himself and under more favourable conditions than we've had for a number of years. 11 May marks the opposition of this Planet and although you'll probably receive Nova Notes after that date, it's not too late because the Earth's closest approach is on Saturday 19 May when it will be 0.531 A's (or 79.5 million km) distant--the most favourable opposition in 10 years and during this apparition it will reach an almost dazzling -1.9 mag.

The diagram shows recent and future oppositions. They occur every 2 yrs 50 days (as opposed to the orbital period of 1.88 yrs.) and this synodic period carries Mars around its orbit relative to the Earth's position.



The cause of the changing distance at successive oppositions results from the fact that the orbit of Mars is elliptical while the Earth's is almost circular--hence depending on the relative positions, the distance can be as great as 97 million km or only 56 million km as occurred in 1971. At that most favourable opposition, the disc of Mars was 25" in angular size as compared with 17.6" this time. The disc this month will be about the same size as you usually see Saturn and is large enough to allow you to see a fair amount of detail, particularly if you have some filters to use on your telescope's eyepieces.

With a red filter, you will be able to distinguish dark features such as Syrtis Major and Meridianii Sinus more easily, while a green or yellow filter will bring out the areas covered by frost or fog. The Tharsis region surrounding Olympus Mons is the best place to



Composite Mars map for central longitude 180°. (See Figure 12-11a).

look for fog and at this opposition we'll see the small white North Polar Cap tipped Earthward. Mars is approaching northern hemisphere summer and one may expect to observe developing dust storms after opposition which occurred in 1976 as Viking I approached the red planet. Hence the visibility of some features may be adversely affected after opposition. Some types of features are transient and therefore require careful and repeated observation if they are to be seen. The rotation of the planet will also bring different features into view from hour to hour, so don't just look at Mars at the beginning of a session and forget about it, but go back several times in the evening and compare what you can see. And of course, compare your telescopic view with the map on p. 98 of the Observer's Handbook or with the one provided here.

A few last hints for observing Mars--don't set your telescope up on the driveway pavement if the Sun has been out all day. The warmth may be nice for you, but its effect on image quality is another matter. To see maximum detail you will require moderate to high magnification under steady sky conditions. People have often commented to me that they are disappointed with Martian observations but I believe this is due largely to impatience. If you observe it carefully under good conditions and at 2 or 3 sufficiently high powers, you'll be surprised just how much you can distinguish--and with a little concentration and luck perhaps you too will make out those infamous canals!

R.C. Brooks

ASTRONOMY AND THE GREAT DYINGS

As many readers are probably aware, a new theory has been put forward to explain the mass extinction of the dinosaurs which occurred 65 million years ago. This theory has as it's evidence the fact that clay deposited immediately following this event contained 160 times as much of the rare element iridium as normal terrestrial rocks. The fact that iridium occurs with this abundance in some asteroids prompted the idea that a large asteroid crashed into the earth and blasted so much dust and debris into the atmosphere that the resulting loss of sunlight killed off almost all plants and as a result, most animal life as well. This theory was proposed in 1979 and a hunt began to see if iridium was found in the soil after several other major extinctions. Iridium was found in the soil following a mass extinction which occurred 37 million years ago, but none was found at all for several other extinctions, implying that asteroids were involved in only some of Earth's mass extinctions.

However, in 1982, two scientists published the results of a list which they had compiled of some 250,000 species of marine animals. The list contained two vital pieces of information: the dates at which the family appeared and disappeared in the fossil record. After much statistical work they found that mass extinctions had occurred over the last 250 million years, and that they occurred every 26 million years! This was independently confirmed by another researched who had used radiometric methods to date the four extinctions of the Cretaceous period and found that they were exactly 26 million years apart.

It was now that people began to look a mechanism which could cause this type of event repeatedly over such a large time scale. To date, two astronomical sources have been proposed. The first predicts the existence of a red dwarf which with the sun forms a binary system. This dwarf star would have reach a distance of at least two light-years at perihelion and approach to within half a light-year of the sun at perihelion, with an orbital period of 26 million years. At perihelion it would dislodge a large number of comets from the Oort cloud which would then fall into the inner solar system and bombard the planets, including Earth. The main objection is that a binary system of this sort would be unstable due to perturbations from other stars. That has not stopped the group who thought of the idea from proposing a name for this object, they favor Nemesis; however another name has also been proposed ,George, after Saint George who slew the dragon (dinosaurs).

The other theory involves the sun's motion through the Milky Way. In it's orbit about the center of our galaxy, the sun's orbit passes up and down through the plane of the Milky Way about once every 33 million years. It has been proposed that the gravitational influence of dust clouds in the plane could also bring about a cometary bombardment of the inner planets. This theory also has it's drawbacks, most notable of which is the fact that the sun is now very close to the plane and should in fact be close to it's maximum distance from the plane as determined by the dates of the last several extinctions

Fortunately, both theories show that we should be about 15 million years from the next of the great dyings.

Pat Kelly

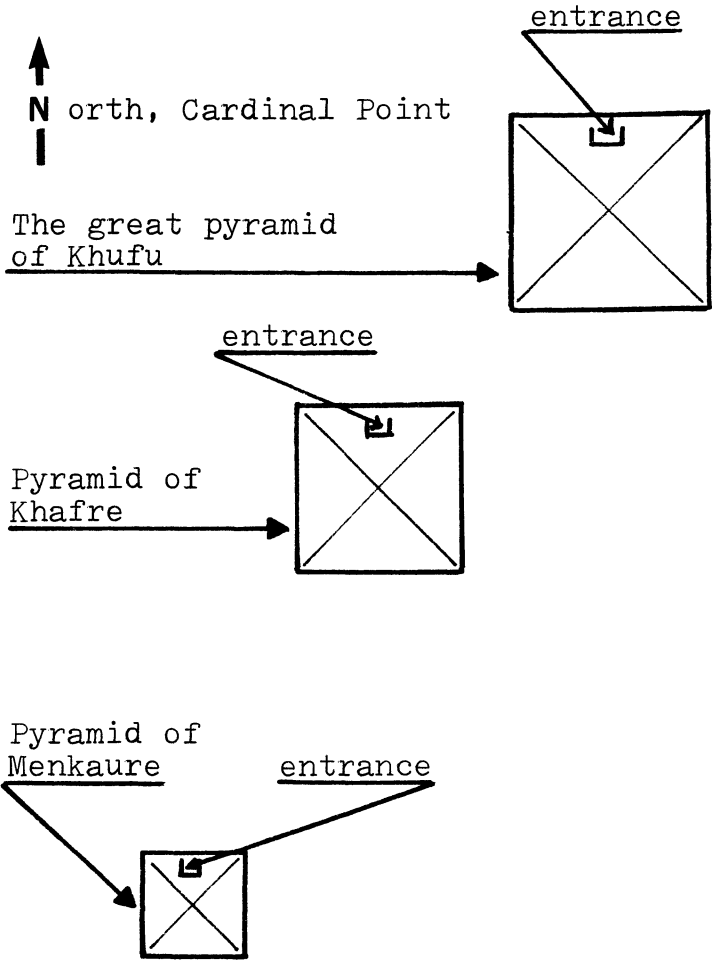
DATING WITH ASTRONOMY

Many astronomers have looked not only to the stars for a challenge and knowledge but have also cast an occasional eye into the fields of other disciplines. One of the earliest mathematicians, physicists and astronomers to apply his interests to the field of archaeology was John Herschel who was born on 7 March 1792 and died on 11 May 1871. He was the son of William Herschel who is known to us the discoverer of the planet Uranus (1781).

Early archaeological interests lay in the collection of art objects and little attention was paid to historical aspects of these finds. The Napoleonic era was a time of change and enlightenment that was to affect much of the western world. This came about with Napoleon's campaign in Egypt and Syria (1798-99) which created new interest in the pyramids of Egypt. Up to that time virtually no serious archaeological work had taken place in the mid-east. Scientists accompanying Napoleon did a lot to popularize Egyptian antiquities and later the exploration by Vyse and Perring, published in 1840 caught the attention of many academics, including John Herschel. Here, some mathematical data relating to the pyramids seemed to be of astronomical significance and he applied his energies to place it into its proper perspective.

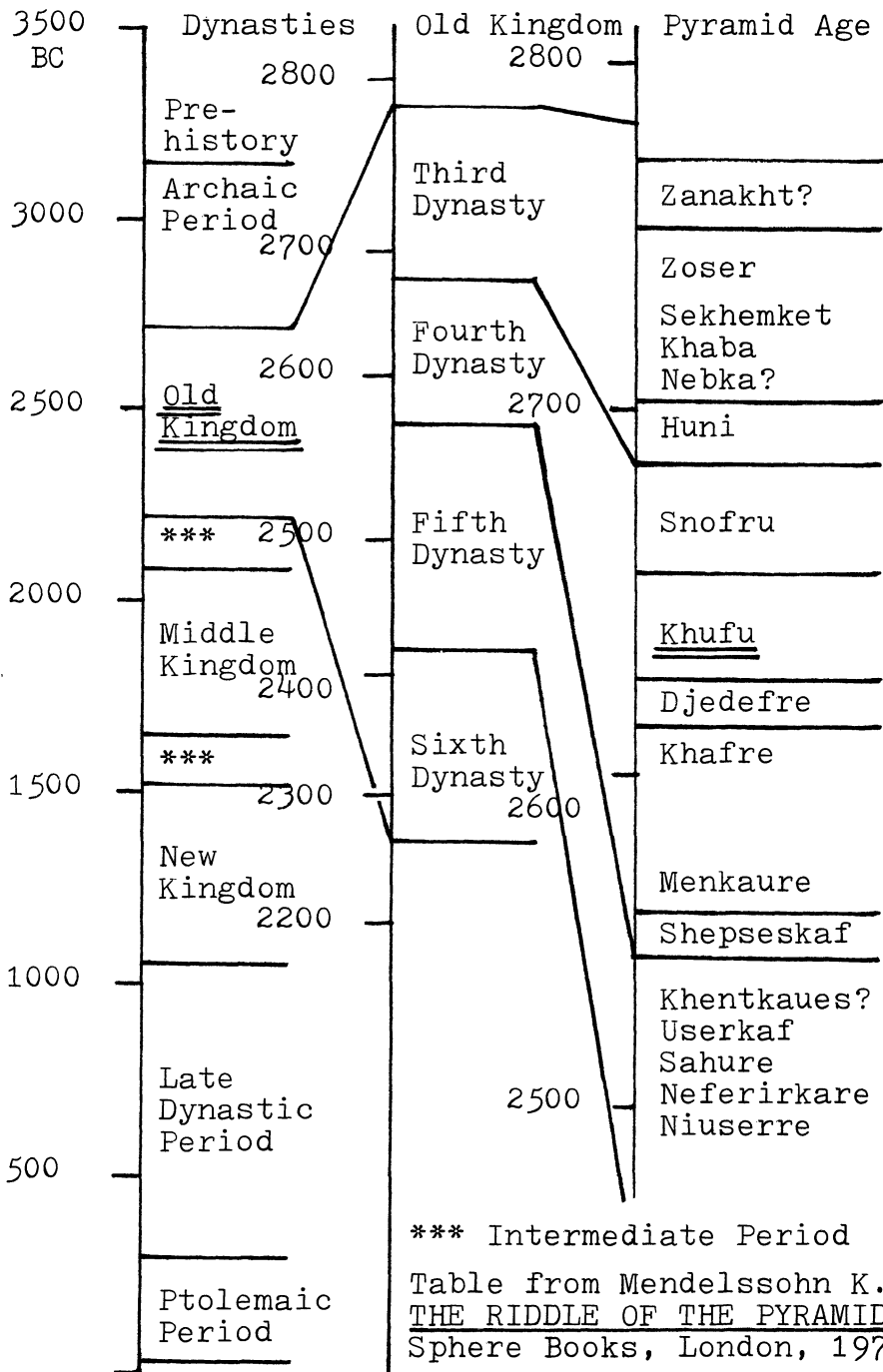
It was discovered that the four sides of the "great pyramids" at Giza in Egypt were aligned quite accurately with the cardinal points of the compass and that the entrance passages to the pyramids might well have been in orientation with a bright North star. Evidence indicated that the pyramids were constructed from about 2800 BC onward. Herschell would therefore have to look for a star that was at the celestial pole about 4000 years ago.

Pyramid Orientation at Giza, Egypt



Drawing of pyramid orientation from Hawkes J., ATLAS OF ANCIENT ARCHAEOLOGY, McGraw-Hill Book Co., Toronto, 1975

Outline of Egyptian Chronology



John Herschel believed that he could determine the age of the pyramids by using astronomical references and data compiled by Vyse for the pyramid of Khufu. The earth spins through space like a top with a slow conical movement about its axis. This motion is called precession and has a period of about 26000 years. Herschel thought that the builders of the pyramids had intentionally aligned the entrance passage to a bright star and he concentrated on finding one that would have been at the celestial pole about 4000 years ago.

Since precession changes the night sky at the celestial pole over a long period, Herschel worked backward in time until he came accross one that met his requirements. He found one that was located in α Draconis and at the time of the building of the pyramids it would have shone down to the entrance passage (about 2800 BC). Finding this star gave archaeologists an independent means for ensuring the accuracy of pyramid dating.

It is to John Herschel's credit that he did not attempt to link these astronomical findings to the speculation that the pyramids were used as astronomical observatories. Modern archaeological evidence has found that they could not have served that purpose since the entrance passages were filled with stone plugs. Since Herschel's time archaeologists have more and more employed the multi-disciplinary approach to determine that the pyramids were used as funerary edifices for Egyptian rulers to bring about a reunion between the deceased ruler and heaven. To us however, the alignment of the pyramids is one question that still remains to be answered and understood.

Peter Steffin

Topical Astronomy

One of the extra pleasures of any hobby comes when it can be combined with another interest. Such has been my case as I have been able to combine my interests in both astronomy and stamp collecting. This type of interaction would have been quite futile even as few as 25 years ago. In those days, there were considerably fewer countries to issue stamps and those stamps that were printed usually commemorated events and people associated with each particular country. However, as more and more colonial states became independent, and as stamp collecting became more and more popular, it did not take long for many countries to see that they could raise considerable amounts of money by issuing many different stamps and selling them to collectors. Indeed there are cases where countries with no airline service and populations in the order of tens of thousands would print millions of stamps each year including airmail stamps!

This proliferation of stamps forced many philatelists to abandon all hope of collecting each and every new issue. Many decided to restrict themselves to fewer and fewer countries, but others saw this as a new opportunity and began what is known as "topical" collecting, that is, collecting all stamps which focus on a single topic, such as flowers, art, horses, even stamps depicting people who wear glasses or mustaches!

As public interest in the growing American and Soviet space programs increased, stamps with space themes began to appear with increasing frequency. Today one of the major topical is astronomy and space. Stamps issued that would fall under this category include a wide variety of

subjects, from the launching of communications satellites (Canada issued such a stamp in 1966 to mark the launching of Alouette II) to the landing of probes on other planets; from pictures of celestial objects to the opening of a new planetarium.

Botswana issued a set of four stamps depicting the night sky as seen from this southern African nation and the stamps show the constellations of Orion, Scorpio, Centaurus and Crux. Both Gibraltar and the Bahamas have issued stamps showing views of their countries taken from Landsat. In 1974, Ascension Island issued a set of 14 stamps based on the theme "Man into Space". Included in this set are stamps showing early Chinese rockets, Galileo and his observations of the moon, the 5 metre telescope at Mount Palomar, Mariner 7, the Apollo 11 mission and a view of a futuristic space research station. There is also a beautiful set of stamps from Yemen showing current space vehicles as well as spaceships from famous works of science fiction.

Although many stamps are issued specifically for events of national importance, there are occasional happenings which bring recognition from countries around the globe. Probably the two events which produced the most number of stamps occurred in 1969 when Neil Armstrong set foot on the moon and in 1973 which marked the 500th anniversary of the birth of Copernicus. Perhaps astronomy will once again provide a world-wide focal point for philately in 1986 with the return of Halley's comet.

Pat Kelly



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NOVA NOTES INDEX

May-June 1984

Volume 15/Number 3

1984 Halifax Executive	43
Notice of Meetings	44
Miscellaneous Notices	Halifax Centre 48
Cartoon	Hart 49
Cartoon	Hart 50
Mars Opposition May, 1984	R. Brooks 51
Astronomy and the Great Dyings	P. Kelly 55
Dating with Astronomy	P. Steffin 57
Topical Astronomy	P. Kelly 61
Cartoon	Hart 63

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