NATIONAL NEWSLETTER

July 1972 Total Solar Eclipse

The momentum of activity surrounding the July 10, 1972 National Solar Eclipse Expedition has been rapidly increasing. As was reported in the August issue of this NEWSLETTER, three potential observing sites were closely scrutinized (Pointe-des-Monts Que., Shippegan N.B., Charlottetown P.E.I.). However, since that time there have come many suggestions promoting the addition of an "arctic" observing site to the three existing maritime locations. Subsequent study has indicated that the community of Baker Lake offers the Society the best opportunity to successfully observe the phenomenon from an "arctic" location. Due to its relative isolation (Keewatin District, N.W.T.) and the resulting necessity for chartering an aircraft etc., the cost per individual for observing at this site will inevitably be higher than any of the other three. However Baker Lake exhibits *definite* though not spectacular meteorological advantages, as the following table indicates. There are of course other relevant and critical factors to consider, and in an effort to clarify the advantages and disadvantages of each site, some of these considerations have been included in the table.

	P-des-M.	Shipp'n	Char'n	Baker L.
July mean sea level air pressure (mbars)	1011	1012	1013	1009
July mean mixing ratio*	62	69	71	38
Mean July precipitation (in)	4	3	3	1.5
Mean July hours of bright sunshine	240	262	258	284
Mean July cloud cover (tenths of sky covered)	6.0	5.8	6.0	6.6
Mean daily July temperature (°F)	61	65	64	51
July wind chill factor (kg-cal/m^2-hr)	460	390	400	618
Altitude of sun at totality (degrees)	37	36	35	46
Approximate duration of totality (min:sec)	2:14	2:13	2:11	2:36
Approximate Ephemeris Time at totality	20:31	20:33	20:35	19:43
Serviced by nearby daily scheduled airlines	Yes	No	Yes	No
Serviced by all-weather asphalt roads	Yes	Yes	Yes	No

*grains of water vapour per pound of dry air.

Reference to the above tables indicate that the chances for observationally successful expeditions are in each case favourable but by no means excellent. I stress however that *no other* locations on the entire eclipse path can offer as much in terms of regional accessibility or the availibility of accommodations, chartered transportation services, food etc. as those presented in the tables.

The expeditions will be coordinated by the recently appointed National Coordinating Committee for the 1972 Solar Eclipse. All Centres are asked to begin preparing for this national observational event, and in particular to determine as best possible the number of people that will be participating in association with each Centre. On a projected basis of available space, any interested foreign observing groups (in particular reference to American observers) are welcome to participate in any of the expeditions.

Continuing details will be presented in future issues of the NATIONAL NEWSLETTER as developments necessitate.

La Société organise une série d'éxpeditions nationales pour observer l'éclipse du soleil du 10 juillet 1972. Les quatres localités designées pour les observations sont au Pointe-des-Monts Que., Shippegan N.B., Charlottetown I.P.E., et Baker Lake N.W.T. Parce que l'éclipse passe au-dessus d'un grand part du nord-est du Québec, on espère avoir beaucoup de participation des Centres situés dans cette province. Renseignements additionnaux sera présentés quand necessaire dans le NATIONAL NEWSLETTER. *En attendant tous les Centres sont priés de commencer les préparations pour le programme de l'éclipse et surtout de particulariser le nombre de personnés qui participeront avec chaque Centre.*

MONTREAL SI BROWN

Planetary Space Missions for the 1970's

Missions into interplanetary space in the 1970's will be varied and scientifically profitable; they include orbiting and unmanned landing missions on Mars, fly-bys of Jupiter, fly-bys of Venus and Mercury, and close visits to all other planets in the solar system.

Technical problems include those of radio engineering for ground-to-space communications, trajectory testing, determination of parachute flight characteristics in the Martian atmosphere, and the mating of the Titan (Gemini) booster with a hydrogen-fueled Centaur vehicle as a planetary workhorse. Missions lasting ten years in space will also pose a problem. However, the outlook of most space planners is echoed in the words of James E. Long, the Jet Propulsion Lab's deep space planner—"The technological challenges . . . are formidable but not insurmountable".

In 1971, two Mariner spacecraft will be put into Mars orbit if all goes well. They will carry much the same equipment as Mariners 6 and 7 did, but will have more complex radio equipment and large retro rockets. With a designed operational lifetime of 90 days in orbit, they will have a chance to map a great amount of the Martian surface at a resolution of 1.1 km. The second spacecraft will concentrate on variable features, recording changes from an orbit which will place it over the same feature once every four days. Spectroscopy will complement photography to determine the composition of the Martian atmosphere.

In March 1972, then April 1973, two small Pioneer spacecraft will be launched to scan Jupiter's equator and poles, respectively. This project is being managed by the NASA Ames Research Centre.

Later in 1973, a tenth Mariner will leave earth, bound for Venus, where it will perform experiments and use the gravitational field to "carom" to Mercury, where it will obtain much-needed data about that planet.

1975 should see the launch of a Titan-Centaur bearing a Viking spacecraft, to be placed in a trajectory for a Mars landing to follow in early 1976. A landing vehicle will descend, taking readings from the time it enters the atmosphere until the time that it runs out of power, or the other part of the vehicle, which remains in orbit as a relay station, does. The lander will be biologically shielded until its landing, to prevent contamination of Mars. The data sent back by the landing will include photos, meteorological data and chemical/biochemical data. The orbiter will take position-finding

photos, as well as acting as a rebroadcast station. The information provided by Viking about the presence of life, or its absence, on Mars, will be of great value to astro-biologists.

Although not too many details are available, there will (if U.S. Congress approves a 1972 budget) be two "Grand Tour" outer planet missions which will give close fly-bys of the outer planets. One will visit Jupiter, Saturn and Pluto; the other, Jupiter, Uranus and Neptune, both continuing on into intergalactic space. The launches are planned with a Titan-Centaur and an unusual planetary arrangement will allow, by planetary "caroming", a great extension of this launch vehicle's range. The objectives of the mission include, besides close-up overall studies of the planets involved, counts of particle density in the asteroid belt, investigations of the Jovian Red Spot and radiation belts, analysis of Saturn's rings (but not flying too near them because of mass perturbations) and testing of equipment for long-duration space flight.

In my opinion, whereas the 1960's will be remembered for man in space as a pioneer, the 1970's will be known as the era when true scientific space exploration began.

LONDON MARTIN G. CONNORS

Manger in the Sky

Rising after nine o'clock during the Christmas season is the constellation of Cancer, the crab, aptly named because it once held the summer solstice, where the sun, having climbed to its highest position above the northern part of the earth, began to go backwards, like a crab, on its way south again.

From a visual standpoint, the constellation has little to offer, being faint, with no stars brighter than fourth magnitude. It is of importance only because it is one of the constellations of the zodiac.

The story goes that the Crab had the temerity to pinch the toes of the brave Hercules, at a most inconvenient moment, when the latter was concentrating his energies on getting the better of Hydra. Hercules, in his annoyance, crushed the poor creature, but the gods were sympathetic and arranged for it an entry, however timid, into the Halls of Heaven.

It is altogether fitting that such a modest constellation should hold a modest manger. Cancer, in its entirety, is shaped something like an inverted Y. Slightly to the north and west of the joint of the Y is an interesting open cluster called Praesepe, the Manger. It covers about three square degrees of sky and looks like a nebula to the naked eye. Cancer may be found between Gemini and Leo, and a line drawn from Nath in Auriga to Pollux in Gemini, and prolonged about 15 degrees, ends in this patch of nebulous light. Its distance from us is something like 3000 million million miles—a long walk, though short as celestial distances go.

Nearly 400 stars make up this cluster. Half of them belong properly to the cluster; that is, they have a common motion. The others just happen to be in that vicinity. There are lots of double, triple and even multiple stars in the cluster, some yellow, some orange, but most of them white, though not so purely white as the stars in the Pleiades. The cluster is easily seen on a clear, moonless night, and it is said that under exceptionally clear skies, some individual stars can be discerned.

The Asses: Just above the joint of the Y is a star named Asellus Borealis, the Northern Ass, and marking the joint of the Y is Asellus Australis, the Southern Ass. These complete the picture of the Manger with the Asses standing by.

The cluster, in our time, is commonly referred to as the Beehive. Allen, in his admirable work *Star Names*, confesses that he could find no historical background for this, and for one's own part, one might pose the bewildering and logical question: why ever should asses eat from a beehive?

Born at this season as the great Cross sinks into the west, the Manger is more ancient than the misty Christmas scene it represents, for it has been a weather sign from time immemorial. If the cluster cannot be seen, while faint nearby stars can, it means rain, for a very small amount of excess water vapour in the air will hide it. As the Latin poet Aratus puts it:

> "A murky Manger with both stars
> Shining unaltered is a sign of rain.
> If while the Northern Ass is dimmed
> By vaprous shroud, he of the south gleam radiant,
> Expect a south wind: the vaprous shroud and radiance
> Exchanging stars harbinger Boreas."

ST. JOHN'S — MRS. DORA RUSSELL

News Notes

Congratulations to M. Adelard Rousseau of the Centre d'Astronomie de Montréal, whose refracting telescope won first prize at Stellafane in 1970.

At a meeting of the Council of the International Union of Amateur Astronomers, held in Brighton, England in August, Mr. Ken Chilton of the Hamilton Centre was appointed to the Executive Committee of that Union.

The I.U.A.A. will sponsor an International Astronomical Camp in Italy from July 28 to August 11, 1971. As in the case of previous camps of this kind, it will provide an excellent opportunity for young people of many nations to learn, discuss, observe and exchange ideas and experiences. English and French will be the official languages, and the cost of the camp will be less than $35.00. Space is limited, so if you are interested, you should write without delay to Ken Chilton, 93 Currie St., Hamilton.

R.A.S.C. Journal

Copies of the February and April 1970 issues of our JOURNAL are urgently needed at the National Office. Marie Fidler would much appreciate receiving either one or both from any member who does not wish to keep copies for future reference. Many thanks!