NATIONAL NEWSLETTER

August, 1977

M42, le 13 déc. 1976. Célestron 8 avec télécompresseurs (f/5) sur 103a F; 15 minutes.
(Photo par LOUIS GAGNÉ *et* MARIO LAPOINTE.)

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Deadline is two months prior to the month of issue.

Figure 1. L'Observatoire du Collège de Lévis, tel qu'il apparaît depuis le chemin. Remarquez le dôme à l'extrémité est de la bâtisse ainsi que la plate-forme d'observation.

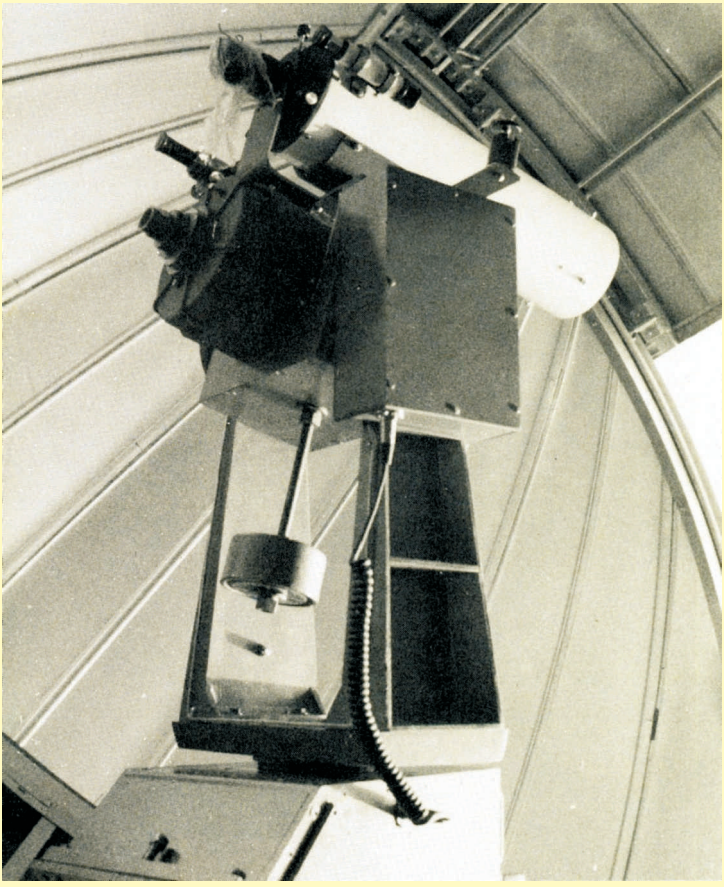

Figure 2. Lamonture équatoriale à fourche est mise en evidence. Notez le coutre-poids sous le Celestron-8 ainsi que le fils flexible fournissant le pouvoir pour la commande de la déclinaison.

L'Observatoire du Collège de Lévis

par Damien Lemay
Centre de Québec

Depuis 1974, les amateurs d'astronomie de Levis et des environs, ont à leur disposition un observatoire astronomique confortable. Située a St-Nérée de Bellechasse, i.e. quelques 30-40 minutes d'automobile du centre-ville de Lévis, cette facilitée est l'œuvre de M. Alphonse Tardif, professeur au collège de Levis.

La bâtisse mesurant 14′ × 28′ × 8′, est surmontée d'une plate-forme d'observation et d'un dôme. Ce dernier, qui a 10′ de diamètre, provient de la firme ASH MANUFACTURING COMPANY, possède un contrôle électrique pour l'ouverture de la fenêtre d'observation ainsi que pour sa rotation, est supporté par un mur circulaire de 4′ de haut. La plate-forme

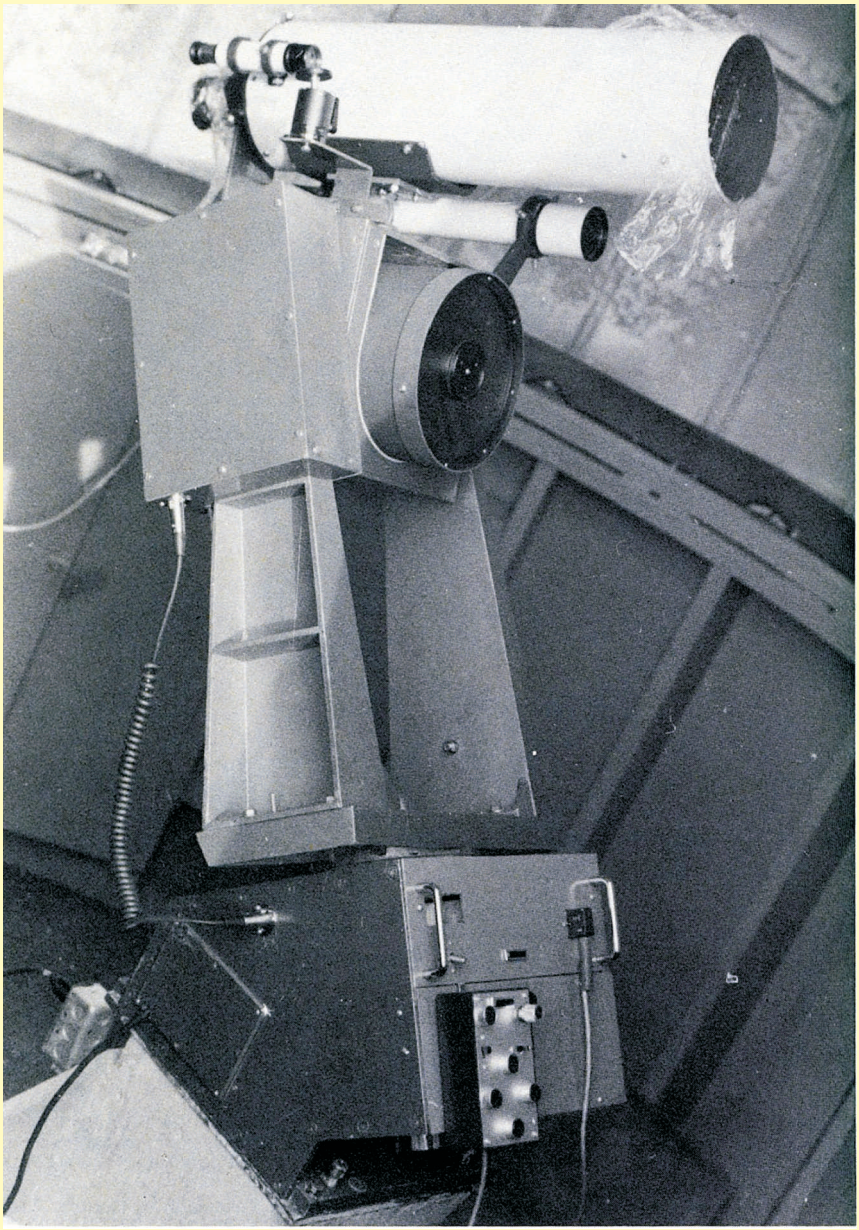

Figure 3. La monture à fourche est mise en évidence. Notez le fils flexible fournissont le pouvoir la commande de la déclinaison, ainsi que le soignée de commandes accrocheé à la base de l'équatoriale.

d'observation est pratique pour étudier le nom des constellations, l'observation à la jumelle ou le comptage des étoiles filantes. Des coussins sont disponibles pour observer confortablement couche sur le dos. L'accès est depuis le dôme, lequel est lui-même atteint au moyen d'un escalier intérieur.

Le premier étage est occupé principalement par une salle capable de recevoir de 15 à 20 observateurs. On peut y projeter des films et des diapositives et plusieurs livres, cartes du ciel, photos, etc... sont disponibles. Une chambre noire et une salle de bain occupent le reste de l'espace.

Une colonne de béton armé de 30″ de diamètre et mécaniquement isolée de la bâtisse, fournit un support très solide à l'instrument. Elle est ancrée solidement dans le roc au moyen de tiges d'acier.

Une nouvelle monture équatoriale (était ajoutée en 1976 afin) d'améliorer les performances en photographie astronomique. Cette monture à fourche, comme on le voit sur les photos, fonctionne aussi bien qu'espérée. L'axe polaire est en acier inoxidable avec un diamètre variant entre 60 et 95 mm, est monté sur des roulements à billes de précision, alors que la vis sans fin a 12″ de diamètre et 285 dents. L'axe de déclinaison, également en acier inoxidable, a 35 mm de diamètre, auquel lui est associée une vis sans fin de 8″ de diamètre et 189 dents. Le mouvement motorisé sur les deux axes peut être utilisé pour pointer aussi bien que pour guider. Un oscillateur contrôlé par cristal et un circuit logique permettent une vitesse de guidage très précise.

L'instrument principal est un Schmidt-Cassegrain de Celestron Pacific, d'un diamètre de huit (8) pouces. Acheté il y a plusieurs années par le Collège de Lévis, ce vétéran a eu des temps difficiles, étant transporté ici et là. Maintenant, il demeure installé en permanence dans cette magnifique bâtisse. Il pourra faire place bientôt à un instrument de quatorze pouces (14) pour lequel la monture est prévue.

Pour guider, on y a couplé un télescope Cassegrain de 6″ de diamètre (ouverture F/15) muni d'un oculaire à réticule illuminé. Un viseur, consistant en un réfracteur de 60 mm de diamètre (500 mm de distance focale) complète cet instrument.

Des expositions très précises, d'audelà de 30 minutes sont possibles au foyer du Celestron 8. Equipé d'un télé-compresseur modifiant l'ouverture de F/10 à F/5, plusieurs nébuleuses sont alors accessibles photographiquement.

Ces installations sont à la disposition des amateurs regroupés sous le nom du Club d'Astronomie du Collège de Lévis, dont M. Tardif est le membre permanentle plus actif ainsi que membre du Centre de Québec de la SRAC.

Le site est aussi adjacent à un camp d'été pour jeunes où sont donnés divers cours d'introduction aux sciences naturelles, entre autre l'astronomie. Ces jeunes ont ainsi la chance de pouvoir faire usage d'un instrument de puissance moyennement et ainsi de prendre leurs premières photos astronomiques.

En hiver, l'activité est réduite, mais se poursuit quand même. Le confort d'un chauffage électrique au 1er étage permet de se réchauffer au besoin, et même de pouvoir dormir sur place précédant une observation cédulée tôt le matin.

Financièrement, ce projet fût possible grâce à la générosité des Anciens du Collège de Lévis et de l'administration du même Collège.

Les plans de la bâtisse, de même que de la nouvelle monture équatoriale sont de M. Alphonse Tardif. La fourche, en aluminium, a été coulée d'après un moule réalisé dans les ateliers du Collège de Lévis et les autres pièces (vis, transmission, engrenages) furent commandées à la firme BYERS. L'usinage principal de la monture a été realisé par une groupe d'étudiants en fabrication mécanique du Cégep Lévis – Lauzon sous la direction de M. Odina Plante.

Early Morning Graze of Venus, May 14

by B. Franklyn Shinn,
Winnipeg Centre

As reported in *Sky and Telescope* for May, the thirteen minutes around 10:00 Universal Time on Saturday Morning of the fourteenth of the month promised some excitement. It also meant local members had to get up about 2:30 am. to observe the event. About sixteen made it.

The particular interest around Winnipeg was due to the fact that along a path running west to northeast of the city, the northern boundary of the graze path would be observable. Due to the discernible diameter of Venus as distinct to that of a star, the total grazing path would be of the order of a hundred miles wide; but throughout the area lying south of us the occultation would be only partial, to the west of us the event would be so low to the eastern horizon as to be barely visible, while to the east of us the path entered practically virgin territory where access for observing was extremely difficult. Also due to the low altitude, 6° from the west longitude of Winnipeg, bush country was unsuitable.

The Winnipeg Centre was first alerted to the event by a telephone call from Dr. David Dunham, of the International Occultation Timing Association (IOTA) during April, asking if I would act as local organizer for observations. This I was most happy to undertake, as occultation timing is within the field that I believe amateurs can undertake with equipment they can obtain and afford. David Dunham sent me computer printouts of the predictions. These give the latitude and longitude of a succession of points along which the path will lie, together with the predicted time of central graze at that location. The local preliminary preparation consists of plotting these points on the largest scale maps of the area obtainable. This I proceeded to do, and found that the plot passed very near Selkirk, Manitoba. As we have an active occultation timer there, Clyde Reid, I contacted Clyde and engaged his assistance and local knowledge. We concluded that Highways 6, 7, 8, 9, and 59 all provided access to the graze path, and divided up the visiting of what I have nicknamed “Ground Zero” on each of them: the point where the predicted limit, (transferred towards the moon in allowance for the elevation of the area as a departure from a spherical earth surface) crosses the road.

What we wanted was a series of points for three or four miles along a road at right angles to the predicted path, with an unobstructed view to the east down to within six degrees of the horizon. Having had experience with trying to locate Ground Zero on unknown highways after dark on previous graze expeditions, I set out to reconnoitre these well in advance, and Florence (that’s my wife) and I made an expedition of scouting what eventually became the selected site. We then took another afternoon off and drove down to Altona where I spoke to the local radio station manager and asked him, since their station stays on the air all night, if they could provide us with the service of broadcasting the 5:00 am. time pip from either WWV of CHU for us. This would provide an accurate time check in the middle of the graze, if we found that dawn effect caused the shortwave signals to fade. Then we took a swing west as far as Poplar Point and scouted the prospects at other accessible locations.

The original site on Highway 9 from Clandeboye north looked about the best. From the data I then had, it looked as if we’d need to be south of Clandeboye also, and Clyde and I decided that that was quite feasible.

Then a second set of predictions arrived from Berton Stevens who worked with David Dunham running the computer stuff, and it disagreed by some 4½ miles with the former set. I sent off Air Mail enquiries, and Berton Stevens wrote that he was coming to Winnipeg. Dr. Dunham also planned to come. I also got word from H. R. DaBoll and John Phelps that they would drive up from Chicago and join the party. As it developed, they picked up James Fox in St. Paul en route. Dr. Dunham, due to other commitments, had to cancel his plans to be with us.

Berton Stevens arrived on Thursday, and explained that the original predictions were a preliminary run without inserting semidiameter and horizontal parallax for Venus, so we moved Ground Zero north along Highway 9. Then the weather became the factor.

DaBoll telephoned me from Chicago about Tuesday. As of then the predictions were for clear and warm. He asked when I would decide the trip was on. I suggested noon Friday, so he said he’d phone me en route on Friday. As of that time the weather was partly cloudy, but predicted to clear. He decided to come on anyway.

Berton Stevens addressed the meeting of the Winnipeg Centre on Friday evening, and filled us in on the purposes of graze observation, the processes of the predictions, and the analysis of results. Along about 11:00p.m. some of us retired for what seemed a very short night.

At 0300 hrs Saturday morning some cars were seen converging on Highway 9 near Clandeboye, and moving northwards to Petersfield. Skies were 9/10 cloudy, and lightning could be seen at several active points around the horizon. However, Arcturus was hanging out a welcome lantern through a hole in the overcast as we drove out, and from time to time other heavenly messengers waved tantalizing blinkers at us. We carried on.

As the various observers strung out along the road, spirits were low. Then the cry was heard “There’s the Moon!” Sure enough, in a rift of a spreading cumulonimbus to the east of us the

thin crescent of the 11.8% sunlit moon appeared – and under its left hand cusp hung the brilliant sparkle of the Goddess of Love! At that moment she captured all hearts. Telescopes were rapidly rigged, probably in record times. Short wave receivers buzzed and peeped. Conversation became monosyllabic, then as the telescopes came into focus, the incredible sight awakened murmurs of ecstasy: Venus was a tiny crescent just matching the crescent shape of the moon! As both "planets" were getting the same angle of solar illumination, their lighted shapes were duplicates! While one may know these things theoretically, nothing quite equals the thrill of actually seeing the theory come alive in reality.

Then that CuN moved northwards, and the spectacle disappeared, at least where most of us were. Homer DaBoll and James Fox had proceeded to the north limit of events in order to get complete immersion. DaBoll's report sums up the details as completely as possible:

> Glimpsed moon and Venus ca. 09:30 or 09:40, unaided, while setting-up telescope. Started recording Ca. 09:50, but moon and Venus were completely hidden in clouds at that time. Focused telescope on a terrestrial light source about a mile away. Northern cusp of moon became visible, unaided, at 10:01:37. First glimpsed moon in telescope about 10:01:51.
>
> 10 02 04 Started observing. (Axes clamped and moon focused)
> 10 03 02.9 Dark limb reappearance
> 10 06 53 Ended observing.
>
> Clouds began obscuring the image noticeably at 10:06:25. By 10:06:42 the moon was not visible, and Venus was barely visible. By 10:06:53 Venus was not visible. Continued recording and trying to recover Venus and the moon until 10:10:08. By the time it finally became lost in the clouds, the cusp of Venus had grown to be easily recognizable by its shape.
>
> At best, thin clouds covered the objects. I feel that there is at least a 70% probability that the reappearance was a true third contact, no more than 30% that it was a cloud event.

Fox's report is similar. Seemingly our friends from the South did at least get some information for their long trip. Dr. Dunham tells me that a nighttime graze of Venus has yet to be observed.

"As Maxwell Smart would say," commented Clyde Reid, "Missed it by THAT much!"

An Eclipse of Iapetus by Saturn Predicted for October 19, 1977

by C.E. Spratt

Victoria Centre

As most observers of Jupiter are well aware of the eclipses and occultations of its moons by the planet, I will not dwell on them here. However, not as well known, perhaps, are the occultations and eclipses that can occur of the moon *Iapetus* by Saturn. This is the only observable satellite of Saturn that can be occulted or eclipsed by the rings. Such an event is predicted in the BAA Handbook for 1977, to occur on October 19th, 1977. This event should be visible for the western parts of North America, later events in Australasia, and the last stages only will be visible from Europe and the British Isles. As there are uncertainties in the orbits of the bodies involved the times listed as per the BAA Handbook and indicated below are somewhat uncertain and therefore timed observations of this event might prove helpful.

Eclipse by		U.T.			D.	P.
		d	h	m		o
Ring A	begins	19	11	23	65	285
	ends	19	12	34	63	284
Ring B	begins	19	13	19	62	284
	ends	19	15	40	58	285
Planet	begins	19	18	13	54	285
	ends	20	03	40	40	290

D = distance, P = position angle, both measured from the centre of the apparent disk of Saturn.

Astronomy Update

by Dr. Doug. Hube
Edmonton Centre

Recent Results of Research in Astronomy

Included among the constituents of deep-sea sediments are "cosmic spherules" which are small (tens to hundreds of microns in diameter), roughly spherical objects believed to be of extraterrestrial origin. As with ordinary meteorites, both stone and iron spherules are recognized. It has generally been believed that they are "droplets shed from the fusion crust of a meteorite as it ablates in the (Earth's) atmosphere". Recent study of the physical and chemical structures of the spherules suggests, however, that they may be meteorites in their own right, and may have had their presently observed spherical shape when in outer space. Are they in fact particles of cometary debris which entered Earth's atmosphere at grazing incidence and thus were able to reach the Earth's surface with only minor modification to their original forms? (*Nature 266*, 515, 7 April 1977)

On the basis of a photometric test, approximately one-quarter of all classical Cepheid variables are found to have binary companions. This is an important result which remains to be fully exploited. It means that, in principle at least, reliable masses can be directly determined for many of these stars. (At present, Cepheid masses are uncertain by a factor of about 2x.) A better theoretical understanding of the late phases of stellar evolution should follow. (*Monthly Notices* R.A.S. *178*, 505, 1977)

After numerous unsuccessful attempts by many different people, optical pulses have finally been detected from the Vela pulsar, PSRO833-45, which has the second shortest period of all known normal pulsars. Previously, only the Crab pulsar was known to be an optical pulsar. As with the Crab, the Vela pulsar emits a double pulse. The source of the difficulty in detecting these pulses is best indicated by noting that "the pulsed emission has a time-averaged blue magnitude of approximately 25.2". (*Nature 266*, 692, 21 April 1977)

Reprinted from *Stardust*, Edmonton Centre

Newsletters from the Various RASC Centres

by June LoGuirato & Peter H. Ashenhurst
Hamilton Centre

Most, if not all, Centres in the RASC publish newsletters of varying complexity and contents. These range from simple one or two page meeting notices to glossy multicoloured covered newsletters. Some are printed by professional sponsors and others are by typed stencils and mimeographed by the Centre's editorial staff. The majority are of the latter variety. These newsletters are normally distributed to the respective members and to the editors of other centre newsletters.

However, it may be that some unattached members and individual members of other Centres may wish to get copies of the other newsletters. Most of them may be had for an annual fee in the order of $3.00 and as such we provide here a list of Centres and their newsletters. This list was compiled by contacting the various Centres in 1976, requesting a sample copy of their current newsletter and the name and address of its editor. Only those who responded are listed here and any additions and corrections should be sent to: Peter H. Ashenhurst, 135 West 18th Street, Hamilton, Ontario L9C 4G3.

ASTRONOMY LONDON
London Centre
co-ed. Michael Flegel
132 Emery St. W.
London, Ontario N5Y 4T4

ASTRO NOTES
Ottawa Centre
ed. Jon Buchanan
14 Kirkstall Ave.
Ottawa, Ont.

BULLETIN DU CENTRE DE QUEBEC
DE LA S.R.A.C. (in french)
Quebec Centre
ed. Jean-Pierre Bernier
C.P. 9396
Ste-Foy, Quebec, G1V 4B5

NOVA NOTES
Flalifax Centre
ed. Randall Brooks
Dept. of Astronomy
St. Mary's University
Elalifax, N.S. B3H 3C3

SASKATOON SKIES
Saskatoon Centre
ed. Merlyn Melba
Sub P.O. No.6, Box 317
Saskatoon, Sask. S7N 0M0

SKYWARDS
Montreal Centre
ed. Carl Jorgensen
400 Victoria, Apt. 8
Greenfield Park, Quebec.

STARSEEKER
Calgary Centre
ed. John Howell
Calgary Centennial Planetarium
P.O. Box 2100
Calgary, Alta. T2P 2M5

N4OVA
Victoria Centre
ed. F. Younger
585 Aurora Way
Victoria, B.C. V8Z 3J8

NOVA
Vancouver Centre
co-ed. David Hurd
H. R. MacMillan Planetarium
1100 Chestnut Street
Vancouver, B.C.

ORBIT
Hamilton Centre
ed. Peter H. Ashenhurst
135 West 18th Street
Hamilton, Ontario, L9C 4G3

'SCOPE
Toronto Centre
ed. Nick Fraser
c/o. McLaughlin Planetarium
100 Queens Park
Toronto, Ont. M5S 2C6

STARDUST
Edmonton Centre
ed. Paul Deans
Queen Elizabeth Planetarium
Coronation Park
Edmonton, Alberta

WINNICENTRICS
Winnipeg Centre
co-ed J. Wunderlich
37 Petersfield Place
Winnipeg, Man. R3T 3V5

Astronomy Awards for High School Students

Projects in Astronomy carried out by High School Students are invited to be submitted for the 1978 Priscilla and Bart Bok Awards of Boston University. First Prize is $200.00, Second $100.00, and Third $50.00. A concise, 5 to 15 page description of the project in the style of a serious scientific report including references, figures and diagrams whenever appropriate, should be submitted to the Department of Astronomy of Boston University, Boston, Mass. 12215 by *February 15, 1978*. All entries should be accompanied by a brief endorsement from the student's high school science advisor clearly identifying the high school of the participant. For further information call (617, 353-2626) or write Prof. Michael D. Papagiannis, Chairman, Department of Astronomy, Boston University, Boston, Mass. 02215.

The 1977 winners, their high schools and their respective projects were:

1. *Stephen C. Odewahn* (First Prize). Tuscaloosa High School, Tuscaloosa, Alabama. "The Observation and Analysis of Stellar Spectra".
2. *Michael S. Schmidt* (Second Prize). Utica Free Academy, Utica, New York. "Effects of Travel Through Space on the Position and Magnitude of Stars".
3. *Michael Gurnis* (Third Prize). Cohasset High School, Cohasset, Massachusetts. "The Relationship between Crater Floors and Ejecta on the Lunar Surface".

Edmonton Starnight a Success

Reports from Edmonton indicate that some 500 people attended their "Starnight" programmes April 23 and 24. Visitors were able to view the heavens through an interesting variety of telescopes, including: 5 Celestron 8's, 7 Celestron 5, 1 Questar 3.5, a 10-inch F/8 Newtonian, a 12-inch F/7 Newtonian, a 6-inch F/8 Newtonian, a 4.3 inch refractor, and several 3-inch and 2.4-inch refractors. Displays, films and videotapes were also provided.

The Roosevelt of Astronomy. III

by J. D. Fernie
Past President, R.A.S.C.

Lowell's expedition to Chile was so widely publicised that its mailing address was simply "Lowell Expedition to the Andes". The actual site proved to be a matter of some dispute between the expedition's members, Lowell's forceful personality being absent, and a good deal of ill-feeling was engendered between Lowell's assistants and Mrs. Todd, wife of the expedition's leader, whose convictions seem to have been in inverse proportion to her scientific knowledge. Todd himself took a rather casual attitude to everything, and, as one report back to Flagstaff had it, "I guess he must always ask Mrs. Todd; she seems to wear the trousers."

However, by June of 1907 they were camped out at a point about 70 miles inland from Iquiqui (almost 700 miles north of Las Campanas). Here, on the floor of the desert they erected the 18-inch refractor sans dome or other shelter, since the probability of precipitation was absolutely nil. The assistants began the taking of 13,000 photographs of Mars, and almost immediately proclaimed the presence of canals on them. To the annoyance of the assistants, however, Todd found himself unable to see the canals ("Mr. Todd's eyes are not good and he cannot see them"), but he amiably passed on the good news to Lowell, adding "As they looked at these photographs and then flew over the pampas, even the bats (of the desert) screamed oasis, oasis, oasis – *canali, canali, canali!*"

It was the same old story, of course. Lowell might issue lofty proclamations of success, he might subsequently expostulate and exclaim, but without the eye of the disbeliever the canals remained elusive.

But Lowell did not rely altogether on such direct attempts at proving his claims. To bolster his general theory of Mars as the abode of life he wanted more evidence on the physical conditions that prevail there, the composition of its atmosphere, and the like. Thus he

came to invest in one of the finest available astronomical spectrographs, and hired a young man named Vesto Slipher to run it. Slipher's career was almost cut short when, finding the adjustment of the spectrograph difficult, he innocently suggested to Lowell that he visit Lick Observatory to learn the techniques from the experts there. The bellicose Lowell would sooner have had him set foot in hell, and told him that while everyone has difficulties, only the stupid go running to others for help!

In retrospect it is clear that Slipher shared very few of his director's beliefs or enthusiasms. He dutifully took the plates Lowell demanded, but they proved of very little help. (Slipher would offer them to Lowell, saying he thought they were inconclusive; Lowell would then publish a report announcing another major breakthrough.) But when Mars was unavailable for observation, Slipher was allowed to take up his own research interests. He turned to the spiral nebulae, discovering their very large radial velocities and rotational velocities, and thus laying the spectroscopic groundwork of modern observational cosmology. Eventually, his quiet but illustrious career would span 36 years as Director of the Lowell Observatory after Lowell's death; he was 94 when he died in 1969. History has pronounced him a vastly better astronomer than Lowell, yet to Lowell he owed his start.

While Slipher worked on nebulae in the off-Mars periods, Lowell turned his attention to Mercury and Venus (although spectrograms of Venus were frequently called for too). An early Lowell map of Mercury shows its surface criss-crossed by lines, but it was his views on Venus that would excite the Lick observers to new heights of sarcasm. Venus, he firmly declared, was most certainly not cloud-covered, but instead showed permanent markings which resembled the spokes of a wheel. These, however, unlike the case of Mars, were quite clearly naturally occuring features that did not speak for a resident civilization. The ensuing Lick-Lowell battle reached such proportions that at least one newspaper gleefully wrote it up under the headline "The Strife of the Telescopes". As usual, the popular press was on Lowell's side: "Astronomer Holden, being jealous of the implied reproach upon his great telescope and the 'glorious climate of California' denies the conclusions of Lowell.

But it was the canals of Mars to which Lowell returned indefatigably again and again up to the very time of his death (of a massive stroke on November 12, 1916). It is amazing how year alter year for over two decades he managed to keep the controversy blazing, although it is clear that without his highly coloured personality and habit of claiming the most outrageous conclusions as incontrovertible, interest would have died out much earlier. Even so, the public did weary of it all at times. "We have been getting a little more astronomy than usual this autumn," sighed the *New York Times* in November of 1907, "and some of it has been very poor astronomy."

Now that we have finally achieved a close-up view of the Martian surface from spacecraft, and have indeed seen the giant rifts and canyons that are there, is there any vindication of Lowell's claims? Sadly, no. A detailed comparison between Lowell's maps and modern spacecraft photographs has already been made by Carl Sagan and Paul Fox, and their conclusions are quite specific: "A small number of canals may correspond to rift valleys, ridge systems, [etc]. But the vast bulk of classical canals correspond neither to topographic nor to albedo features, and appear to have no relation to the real Martian surface."

Probably the real explanation of the canals lay in an experiment done as early as 1903 by Walter Maunder in England. He asked a group of Greenwich school boys to copy a canal-expurgated picture of Mars, without telling them what it was, and without presenting it too clearly. Their copies showed the tell-tale lines joining isolated features. Concluded Maunder: "The apparent lines on Mars are simply the integration of the eye of minute details too small to be separately and distinctly defined. ... The canals have no more objective existence than those which our Greenwich boys imagined they saw. ... It seems a thousand pities. ..." Lowell, of course, brushed it all aside with a scornful reference to "this schoolboy theory".

There is one last irony to Lowell's astronomical endeavours. In his later years he became absorbed in the probability of there being another planet beyond Neptune. Like Adams and Leverrier before him, he used the observed perturbations of the known outer planet to predict possible positions for what is now Pluto. In fact, we now know that his calculations could not have succeeded, but he, of course, was satisfied with them, and instigated a massive photographic search for the planet at the Lowell Observatory. He died without its being found, but of course it was eventually found on plates of the Lowell Observatory in 1930. The irony is that once its place and motion were measured, the later Lowell observers found that Pluto had indeed been photographed twice on Lowell plates of 1915. Had those plates been properly blinked, Percival Lowell would have departed this world in a much greater blaze of glory and respect than he eventually did. (There is, in fact, a double irony here. William Pickering also

predicted a trans-Neptunian planet – several indeed – and he had a photographic search made at Mt. Wilson. Plates taken there in 1919 also showed Pluto, and again it was missed.)

How then to summarise Percival Lowell? He had the makings of greatness: talent, tenacity, courage, and strength, yet with an underlying kindliness that could belie his bellicosity. He had wealth and prestige to back him. The one fatal flaw was a total lack of scientific judgement and intuition, which, for one of his position and personality, in the end proved unforgiveable to his peers. As the Roosevelt of astronomy he should have heeded his namesake's famous remark. "Keep your eyes on the stars, but keep your feet on the ground."

Mythology and Astronomy

by John Grow

One of the earliest forms of employment was astronomy. From the earliest times astronomers were required to warn rulers of the impending onsloughts of the heavens. It was their responsibility to anticipate any unusual behaviour of the celestial signposts of space and time: a closed ring around the moon, an appearance of a comet, an eclipse of the sun or moon. People did not care for the cause, only the consequences of such events. A comet's tail streaking over half the sky threatened doom to the earth. The people and their ruler had to placate the gods in order that these signposts of doom not appear. Pleasing the gods was in the form of public penance, such as prayer and sacrifice.

In one civilization the eclipse phenomenon was described as a dragon tormenting a sun-eating demon to bring forth his wrath. When an eclipse took place, the lords mounted their steeds and the people gathered in clusters to the beat of a prayer drum. Attempts were made to scare off the sun-eating demon (the cause of the eclipse) by using terrifying masks and noise-making. When this failed to ward off the eclipse, the people were overcome with fear, and prayed to the gods to deliver them from their impending doom.

Through the ages, various religions have viewed astronomical phenomena as divine events. In China the stars became gods. To the Chinese, so sublime were the mysteries of the cosmos, that they demoted their traditional divinities to demons, and created a cult of the stars without priests, myths or dogmas. On the other hand, Babylonian gods became stars, and a highly structured religion developed. The stars in the sky played out the stories of the gods. Similarly the Greeks named the constellations for their gods and heroes. In this manner astronomy has been closely associated with mythology throughout history.

from *Skyward*, Montreal Centre