

SCORPIO

Journal of the Astronomical Society of Frankston Inc

Vol 1, No. 5

P.O.Box 596, Frankston Victoria 3199

SEPT/OCT 1992

FUTURE EVENT

GENERAL MEETING

16 Sept 1992 Technical Session

Multi-Activity Meeting

- Telescope Making
- Computing
- General Observing

(Bring a scope)

21st Oct 1992

Quiz Night

(come and win a prize)

VIEWING NIGHTS

Society Viewing Nights

Observing Nights will be held at the Mt. Martha park at 7.30pm on the following dates:

26th Sept & 24th Oct

{ Melways Map 150 F8 }

COMMITTEE MEETING

The committee will meet at the Brown's residence on:-

24th Sept 1992

29th Oct 1992

The Astronomical Society of Frankston was founded in 1969 with the aim of fostering the study of astronomy by amateurs and promoting the hobby of amateur astronomy to the general public. The society holds a General Meeting each month for the exchange of ideas and information. Regular observing nights, both private and public are arranged to observe currently available celestial objects. In addition the Society provides the services of its members for educational presentations or observing nights for schools and local community groups.

DEEP SKY OBSERVING

WITHOUT A TELESCOPE

Can you do deep sky observing without a telescope? Yes, of course. Everyone starts out in astronomy doing deep sky observing, without even knowing it.

When you first go out with your star atlas, you start observing with of course your eyes only. Naked eye observing is the only way to really get to know your way around. While learning the constellations you will see lots of fuzzy patches in the sky. Most of these are star clusters, globular clusters and even some galaxies. Good atlases will have most of these marked.

I find nothing better in the hobby of astronomy than just going outside at night, laying back in a lounge chair and just looking.

For all those who are just starting out and even the most experienced of you, next clear night why don't you just go outside unarmed { without the telescope or binocular} and spend an hour just looking. Get out the red torch and Norton's star atlas, settle back and just see what you can see. Even the most experienced of us forget what you can see by just looking.

Let me know how you went!

Dark Skys to you all

David Murray

EDITORS MESSAGE

Don't forget membership fees are due. If you are not financial this is your last copy of Scorpio

WELCOME TO NEW MEMBERS

It is with great pleasure we welcome the following people as new members of the society:

Mr. S.Hamm

Meeting Venue:

The Peninsula School

Wooralla Drive, Mt Eliza

(Melways Map 105, F5)

Room F6 at 8.00pm on the third Wednesday of each Month except December/January

Visitors are always welcome

Annual Membership Fees

Full Members \$20

Concession Members \$15

Family Members \$30

Family Pensioners \$25

Membership Fees due 1st July each year

President

David Murray, 132 Bay Road

MtMartha (059)744 204

Vice President

Peter Lowe, 4 Grainstore Court

Langwarrin (03)776 6309

Treasurer

Peter Brown, 7 Kiandra Court

Frankston (03)789 5679

Secretary

Don Leggett, 4 Vellvue Court

Tootgarook (059)85 4927

Committee

Peter Skilton (03)776 5898

Ros Skilton (03) 776 5898

Ken Bryant (03)789 1590

Tony Hales (03)781 3251

Bob Heale (03)787 1748

SOCIETY NEWS

COMMITTEE NOTES

There is very little to report from committee. The Briars Observatory proposal has been submitted to the Mornington Council. As yet there has been no reply.

The Society badges have arrived and gone on sale.

Peter Norman has had a good start to his University of the Third Age Astronomy course. We have been considering an Astronomy for Amateurs course at one of the TAFE colleges but have decided to postpone until after the Briar issue is complete.

Discussions have been held with the Ballarat Society about a visit. A formal visit will be held next year although an informal one might be arranged this year.

Nominations for Office Bearers.

The election of Office Bearers for next year will take place at the November Annual General Meeting. A nomination form has been included with this issue of Scorpio. If you wish to nominate yourself or someone please give a completed form to one of the current office bearers before the election.

Harvest Moons

"Shine on, Shine on Harvest Moon.

Up in the Sky"

So goes the song but what is a Harvest Moon? Well, Harvest Moons occur when the moon is just rising as the Sun is setting. There is thus a full moon on the horizon. The result is an enhanced twilight so farmhands can continue harvesting longer into the night. Interestingly, this is the only time you can see the Sun and a full moon above the horizon at the same time. Due to atmospheric refraction, the moon can be seen even though it hasn't yet actually risen while the Sun can still be seen although it has actually set.

See, I did learn something from Jim Trainer's question and answer sessions

QUESTIONS AND ANSWERS

WHAT ARE TEKTITES?

Tektites are small button shaped pieces of glass found to be strewn over localised S-shaped belts across the Earth. These belts defined the four basic groupings:

Australasia (Australites)

Ivory Coast (Ivory Coast tektites)

Czechoslovakia (Moldavites)

USA (Bediasites from Texas and Georgiites from Georgia)

While it is believed the origin of tektites has an astronomical basis, this is by no means certain and a number of possible theoretical origins have been postulated. Despite their similarity to some terrestrial rock types, tektites do not belong to the rock grouping in which they occur. They are thus assumed to have been transported there by some means.

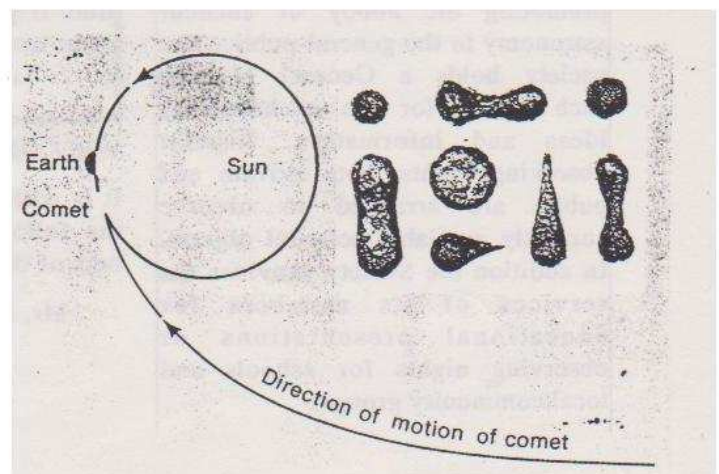
Their glassy appearance and general aeronautical shaping suggests the molten rounded shapes were formed by high speed flight through the atmosphere. Examples of simulated tektites at the Melbourne Museum were produced by this mechanism.

While most tektites are a few centimetres in size, the largest was found in 1932 at Muong Nong, Laos and weighed 3.2kg.

Some theories proposed are:-

- 1) Comet or meteorite collision into the Earth's atmosphere
- 2) Lunar material thrown off by volcanoes.
- 3) Molten material thrown from meteoritic crater formation on the Earth
- 4) Volcanic explosion such as the Kraktoa explosion last century

While it seems the formation of tektites required high speed through the atmosphere, trials to replicate tektites on Earth suggest that either very high speeds are needed or the tektite material was already molten when thrown into the atmosphere. Theory 1 suggests a head-on meteorite/comet collision with the Earth where speeds can reach 70km/sec.(as shown below). The other theories assume the tektite material was molten and thrown into the atmosphere by an explosion. Lunar volcanism seems most likely. At this stage all that can be said is that tektites are aerolites that may also be meteorites.



WHAT'S NEWS IN ASTRONOMY

END OF SPACE RACE.

During the 1950's and 60's the Soviet Union achieve one first after another in space technology. First satellite, first dog in space, first man in space, etc. It was an exciting period as the Americans and Soviets fought it out Olympic style, technology versus technology in the now famous space race.

It was a race that everyone denied. The US claimed they were just going to the moon and the Soviets were more intent on space stations. It was however generally agreed the American's man on the moon mission was the end of the 'unofficial' space race. This unofficial space race came to an endpoint on the Mir Space Station during July when the now defunct hammer and sickle flag was removed leaving the American programme a final winner.

SAIL-RACE FOR COLUMBUS

1992 commemorates the 500th anniversary of Columbus's epoch making voyage across the Pacific. To further commemorate this event a space race has been proposed to start in 1994. The idea is build solar-sail spacecraft and engage in a sail race to the moon using the solar winds for propulsion. The first craft to send back a picture of the back of the moon is the winner. Participants have been attracted from Europe, USA and Japan

THE GREAT ANNIHILATOR

It seems a fair bet these day to assume a blackhole exists at the centre (or close to it) of our galaxy, The Milky Way. The Hubble Space Telescope is being used to show objects at the centre of globular clusters and other galaxies but cannot show the centre of our galaxy due to dust obscuring the view. Infrared telescopes are showing some bright stellar objects at the centre and radio telescopes have been mapping the region for some years however it has not been possible to identify any particular object that positively could be associated with a black hole. Gamma ray observations in the 1970's detected high energy emanations from the centre. The emanations were of particular interest because they had any energy of 511keV. This energy level is important because it is the energy you get when an electron annihilates with its anti-particle a positron to produce gamma ray radiation. The detected 511keV radiation is a sure sign that electron-positron annihilation is going on at the centre and this has got to be the place to look for blackholes. French and Mexican astronomers using a satellite gamma ray telescope in conjunction with a radio telescope have homed in on an object just one degree from the galactic centre. The object appears as several blobs at radio frequencies with bright sources embedded from which annihilation radiation seems to be coming.

DISTANCE TO NEARBY STAR

The race to discover planets circling other stars is on in earnest at present. A variety of search methods are being used. One which has been in use for many years is to accurately measure a star's position and look for any wobbles which may be due to the gravitational effects of orbiting planets. Barnard's star has long been a candidate but the wobble seem to be within the error of measurement. A more accurate attempt on nearby stars has not found any planets yet but has produced a better measurement of one stars stellar parallax from which the stars distance from Earth can be calculated.

Lalande 21185 is a nearby red dwarf in Ursa Major and is the fourth nearest star to Earth. Using an electronic detector called a multichannel astrometric photometer a US astronomer has measured it parallax at 0.3951 ± 0.001 arcsec. This is orders of magnitude better than previous measurements. This parallax translated into a distance of 8.25 ± 0.02 lightyears. The star is approaching the Sun at 86 km/sec which should produce a measureable change in parallax every decade. Although no planetary wobble has been seen yet, it is essential to keep monitoring the star's parallax to buildup a detailed trajectory from which a wobble may yet be found.

HUBBLE CEPHEIDS.

The Hubble Space Telescope has been used to discover 27 Cepheid variable stars in a nearby galaxy IC4182. Cepheid variable stars are know to change brightness in a predictable manner and are used as "standard candles" to enable astronomers to estimate distances. The discovery of Cepheids in this galaxy allows astronomers to compare their distance estimates using other methods. The Cepheid measurements suggest a distance of 16 million light-years close to the 14 million light-year distance derived from observing red supergiants.

Of more than passing interest, this measurement has also allowed astronomers to "calibrate" the brightness of a supernova seen in the galaxy in 1937. The supernova was 17 billion times brighter than our Sun. From this estimate the distance to other galaxies with the same type of supernova can be estimated.

SPIN CASTING A MIRROR.

In April this year the 6.5metre main mirror for the Mt.Hopkins telescope was cast using the spin casting method. Spin casting means the 20 tonnes of glass needed was heated to 1175degC while it was being spun at 7.4 rpm in a special rotating furnace.

As the molten glass is spun around the surface is deformed by centrifugal force to a concave shape. The final shape is within 1mm of the desired mirror shape and while another year of fine grinding and polishing is needed, the use of spin casting has reduced the grinding time by some three years. After spin casting there is only one tonne of glass to be ground away instead of the 4 tonnes which would have been removed by conventional methods

Spin casting seems now to be well established for the manufacture of large optical surfaces and the 6.5m mirror is the largest cast todate. Plans are being made to cast upto 11m instruments

SPECIAL ACTIVITY GROUPS

SOLAR SYSTEM SECTION: OCCULT - "to hide or conceal"

The last several weeks has seen 3 determined joint expeditions by the ASV and ourselves to observe grazing occultations of a star by the moon. A grazing occultation is when the moon limb just "clips" a star. As the star "grazes" the edge of the moon, it dips into and out of the lunar mountain ranges. The result to we earthbound observers is a stellar winking on and off as time progresses. A wink off means we are standing in the shadow of a lunar mountain, whereas a wink on means we are getting a clear view of the star through a valley. By timing the on's and off's it is hoped to draw up a detailed view of the lunar profile. To this end, an observing "fence" is set up where observers are spread out in a line over several kilometers and different parts of the shadow fall on them at different times.

Our first graze occurred at 7:09am 29th June, with the shadow passing over Tyabb. Alarm clocks in at least 5 households were set for about 5am to give sufficient time to reach the area and set up. A quick peek through the curtains confirmed it - total 100% impenetrable fog, the worst I had seen for years! So much for that graze, with Ros and I getting another hour's sleep and our ASV colleagues driving home empty handed before going to work. The second graze of the star 155 Leo was looking a bit more favourable. It was 6:30 on Saturday evening and could be seen between Winchelsea to Bell's Beach. The weather was reasonable when we packed up the car. At about Melbourne the rain hit. Undaunted, and ever hopeful, we pressed on for Geelong. Rain and sunshine alternated every 15 min all the way. We reached Geelong then on to Winchelsea where we rendezvoned with Jim and Patricia from the ASV. (two equally optimistic - did I hear someone say crazy - people with a passion for grazes) Set up at the back of Winchelsea, Ros and I next to a farm, complete with a chorus of sheep, Patricia on the roadside doing her stuff, and Jim parked outside the local cemetery! You can guess who had drawn the short straw. The sky was clearish and we were all hopeful, right up until 3 minutes before the blessed event when the heavens opened up. The shadow of the graze fell on the clouds no doubt then 5 minutes later the sky was clear of course. No doubt Bell's Beach was clear throughout!

The final attempt was due Tuesday night 4th August along a line from Mt.Martha to Hastings foreshore. Another observing fence was set up. Bruce Tregaskis set atop Mt.Martha summit (fending off the indigenous teenagers no doubt), Ros and I were set up South of him on a slope approaching 45 degrees with our ASV friends further South near Safety Beach. We saw the star about 30 minutes before the predicted time but it soon dived into thick cloud never to be seen again.

Incidentally, Ros and I have still never seen a graze though I am told they have been known to occur. Maybe next time?

ENCOUNTER WITH GANYMEDE.by Ros Skilton

It was Tuesday, June 30th and the night was cool, crisp and luckily quite clear of clouds. I thought to myself, "Great! I have a good chance of seeing and timing my first eclipse of Ganymede"

I set up all the equipment in our backyard. Yes, I had the shortwave radio to listen to the relaxing sound of VNG beeps throughout the timing. I had the tape recorder all set to record the event, various eyepieces and our 6" Newtonian telescope. I also had a sketch of what I was expecting to see.

Our black poodle "Pippin" thought it was great fun setting up. She had done this many times before and was egging me on.

Time moved on. The equipment had had time to adjust to the cool temperatures and although it was early, I thought it was time for me to lock onto Jupiter. After some fiddling and adjusting of eyepieces there he was in all his glory glowing in the dark sky. Three moons were clearly visible but Ganymede's spot was empty awaiting its return from eclipse.

With all the equipment on, VNG beeps piercing the silence, Pippin by my feet chewing a bone, I awaited Ganymede's return.

Nothing yet Nothing yet I adjusted the telescope to keep tracking Jupiter and wiped the eyepiece occasionally to remove moisture. Nothing yet then; could that be it? A tiny spot very close to Jupiter and very faint. I wasn't sure. As I watched it gradually became brighter and clearer. "Yes" I shouted for the tape recorder "Hello Ganymede" I was thrilled to see it with my own eyes and at, UT 093429.6, four minutes prior to the predicted time.

Neighbours later told me they were trying to find the cause of the beeps - a backing truck they thought. I think I had the volume up too loud.

My results will be sent off to be collated with others help to refine the orbits of Jupiters moons. As far as I know, no-one else was able to capture this Ganymede timing in Victoria because of cloud cover. If anyone else did, please let me know as I would love to compare results.

I'm certainly hooked now and will be out there looking for more Jupiter eclipses before it sets for the year.

TELESCOPE MAKING

ROUGH GRINDING

In the manufacture of a Newtonian telescope mirror, our objective is machine the surface of a glass blank to a paraboloid shape within a fraction of the wavelength of visible light. At the later stages of this machining individual atoms will be moved around on the surface to produce a final shape however in the first stage it is necessary to grind the glass to an approximate shape. A sculpturing friend of mine once said the sculpturing was easy, you just looked at the stone and remove the unnecessary bits. Well mirror grinding is just the same. The first stage is thus to rough grind as quickly as possible to about the right shape. The paraboloid used for telescope mirrors is very close to a spherical shape and thus it is very convenient to firstly produce a sphere from which a paraboloid can be produced. The grinding process used in telescope making is helped by Mother Nature to produce a sphere without even trying. If you take two plane surfaces and grind those together so they are in contact at all point, there are only two possible outcomes; either both surface are flat or sphere. The way we will be grinding our mirrors they will not be flat. We can thus grind away at our mirrors confident that in the end we will produce a sphere.

The mirror need to be mount at waist height on a work platform you can walk around. I use an old 44 gal drum with a wooden top. The tool itself is held in place by three cleats screwed to the wooden top. A small wooden wedge is used to lock the mirror into the cleats. It does not need to be too tightly held but should be a snug fit. The cleats should be well below the top of the tool to allow clearance during grinding. Before starting to grind, the mirror and tool edges should be beveled to prevent edge chips from occurring. This can be done using a hand carborundum stone. If you have an electric sander I have found the newer sanding papers are ideal for producing a bevel. Make it a good bevel of about 5mm

Starting with an 80 grit carborundum sprinkle a small quantity on to the tool (a salt shaker) and spray on some water from an atomiser. You will need to experiment with the quantities of water and grinding material. Always err on the side of too little rather than too much since we want the individual grains to work as explained below.

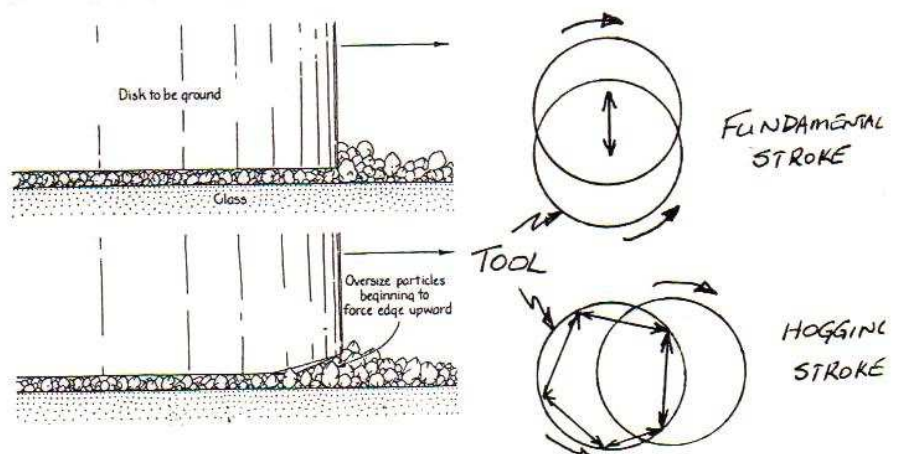
The diagramme shows the two basic grinding strokes at this stage. They are the fundamental and hogging (or chordal) strokes. The fundamental stroke is a simple centre over centre grind action of the mirror over the tool. Every few strokes a step around the tool and rotate the mirror a bit in the opposite direction. This always produced a sphere. The hogging stoke is used to "hogg" out the mirror centre fast. Instead of centre over centre, the mirror centre is ground over the edge of the tool. You can use a lot of weight to speed up the grind rate but be careful not to tip the mirror over the tool edge. Every half hour return to the fundamental stoke before testing progress. After a while you will notice the grinding powder has lost its effectiveness and need re-newing. Don't persist too long with wornout powder, cleanand dry the tool with a sponge and recharge with fresh powder.

THE GRINDING PROCESS

Glass is a material which at the molecular level is analogous to a liquid but has the bulk properties of a solid. From an optical viewpoint this means a glass surface can be worked to an optical polish because its properties are consistent right down to the molecular level. The first stage in producing an optical surface is to remove the bulk unwanted glass by grinding. In the free grinding process individual grains of grinding powder progressively splintered away the surface. These grinding powders are normally silica carbide SiC known as carborundum or alumina silicate (or combinations of both). They both have hardness indices of 9-10 approaching that of diamond while glass has a hardness of 5-6.

The grinding mechanism relies on the point contact between individual grains of carborundum and the glass surface. At sufficiently high applied load the grain's sharp edges vents or crack the glass surface. Known as a median vent, it propagates into the glass by the shearing forces developed as the carborundum grain enters the vent. The median vent and other side vents formed cannot go very far from the original vent site and eventual breaks back to the surface due to the rolling action as the grain is force sideways from the relative movement of the glass and tool. When the vent breaks back to the surface it forms a glass splinter. As the mirror is moved back and forth on the tool, carborundum grains roll until they catch at another site to form another median vent.

Trials on the grinding rate show the amount of glass removed is directly proportional to the weight of the tool and the relative speed of the tool and glass. In the first instance the higher the force applied to grinding grain the deeper the median vent can propargate before returning to the surface. A higher relative speed between the tool and mirror just presents more opportunities for grains to produce splinters.



DISCUSSIONS - THE ATMOSPHERE OF MARS

I wonder how many science fiction stories have been written describing some future exploration of a distant planet and the discovery of some lost civilisation destroyed by a planet wide catastrophe. It seems these days we are more attune to the idea of change in our climate and accept that the Earths climate has not been constant over its history. In fact if it had not been for the mediating effects of the Earths' oceans, our climate would much more changeable. While no lost civilisations have been found yet, the exploration of Mars has revealed a planet with a history of major atmospheric change. With all the thrill of a science fiction story, in 1971 the spacecraft Marina 9 was placed in orbit around the Mars with the major objective of photographing the planet's surface at a variety of resolutions.

Initially treated to a global dust storm that obscured the whole planetary surface, the mission scientists had to make due with the other instruments while the storm subsided and camera could be used. The only features visible were four spots. Three spots were in linear array and named (with appropriate deference to the classical Greek and Latin nomenclature for Martian features) North Spot, Middle Spot and South Spot. The fourth feature closely matched a known feature called Nix Olympica; a prophetic name considering that Nix Olympica is the largest volcano known in the solar system being twice as big as the largest earth equivalent at Hawaii. It took almost six months for the storm to fully subside and the four spots were revealed as the first extra-terrestrial volcanos discovered.

Major planet wide features began to show themselves. Large channels or rift valleys could be seen extending over vast distances across the planet. One particular rift valley extended some 80 deg of longitude - thousands of kilometres long, almost 100 km wide and several kilometres deep. Feeding into these valleys high resolution photographs showed many

meandering channels with tributaries at their sources. If these photographs were of Earth, we would immediately attribute these channels to the effects of running water. This presents a difficulty because the contemporary atmospheric conditions are such that no running water can exist on Mars.

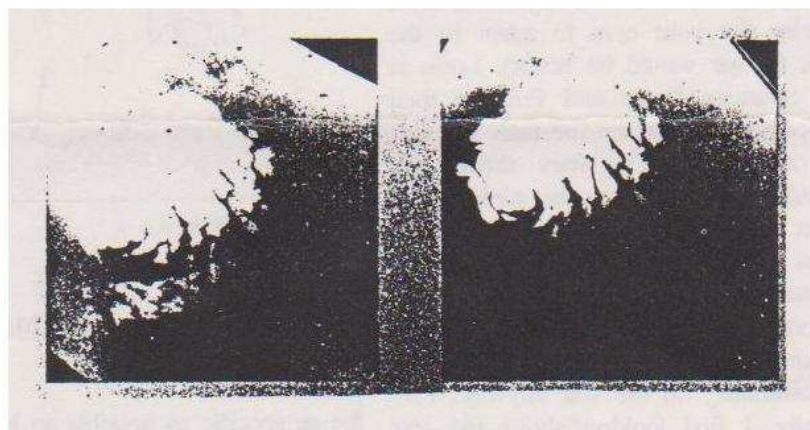
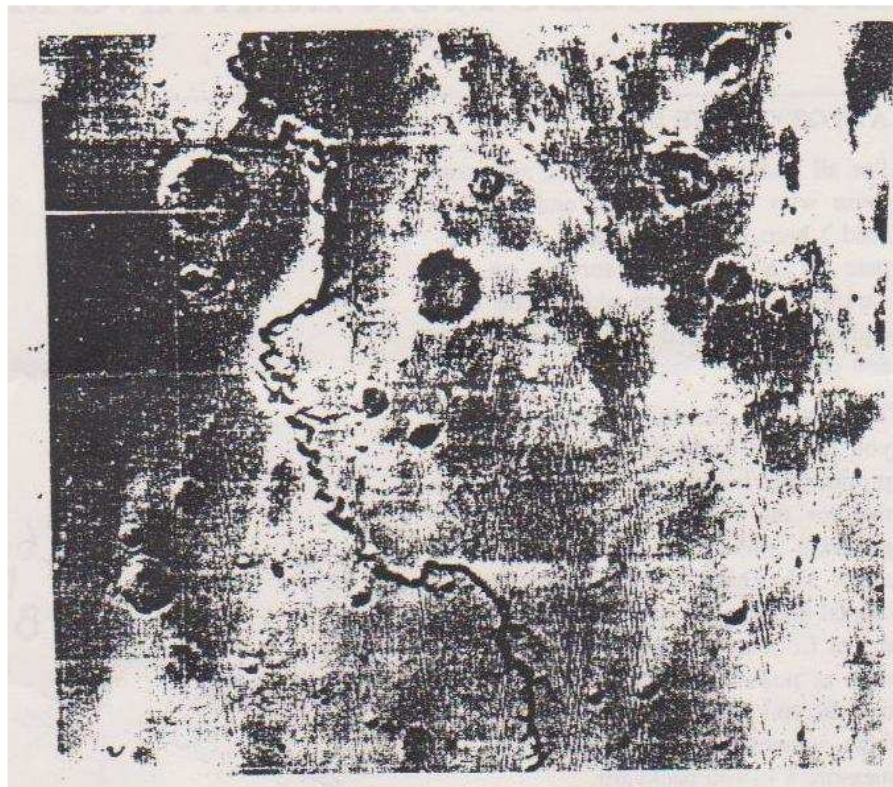
The presence of volcanos on Mars is a problem when trying to understand the current atmospheric conditions. Assuming these volcanoes are similar to their terrestrial counterparts and are driven by the same basic geological processes, we can estimate the amount of material they should have put into the Martian environment. The gases given off from volcanos on the Earth today are in a large part at least carbon dioxide and water vapour. Since we know these are the two principle constituents of the Martian atmosphere and it is reasonable to assume that Martian volcanos also give off CO_2 and H_2O . The temperature of the Martian upper atmosphere is too low for significant quantities of these gases to escape into space and so the question to be answered is "Where is the Martian atmosphere today?"

There is a problem. We know that large quantities of carbon dioxide and water were expelled into the atmosphere and that in the past the

conditions were such that liquid water flowed on Mars. Yet today there is no liquid water, very little atmosphere (65,000 times less than Earth's) and the atmospheric conditions do not allow these gases to escape into space. The answer lies partly here on Earth. When both of these planets were born they formed under basically similar conditions with regard to composition, pressure and temperature. Yet at some time in their evolution they took different paths. On Earth the atmosphere was kept warm by a greenhouse effect based on CO_2 . Carbon dioxide is depleted from the atmosphere by incorporation into carbonate rocks. Earth's mass is large enough that plate tectonic activity continuously recycles these carbonate rocks and converts them back to CO_2 through volcanic activity. On Mars however the carbon dioxide is not re-cycled after conversion to carbonate rocks because Mars does not have sufficient mass to maintain active volcanism for very long. Infrared traces across the Martian volcanos showed they were cold. Apparently Martian volcanism stopped a long time ago. Without the benefits of a greenhouse gas the Martian surface loses its heat quickly. The Martian surface is typical well below zero at the equator and reaches temperatures of minus 130 degrees at the poles. This is an

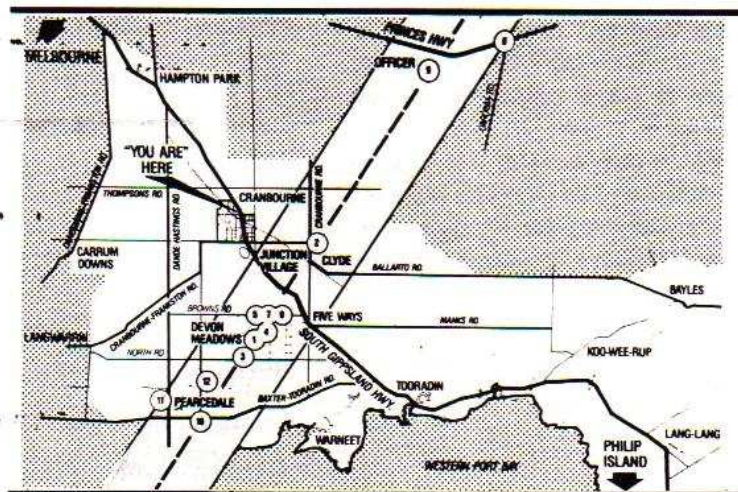


immediate hint to the current whereabouts of the ancient atmosphere. At the Martian polar temperatures, water and carbon dioxide will be frozen out. It appears likely the polar caps are a mixture of water and carbon dioxide. The water is permanently frozen but is this true of the frozen CO_2 ? The atmospheric pressure on Mars has a very interesting value. On Earth the atmospheric pressure is about 1 bar (14psi for those imperialists who insist on using real units). On Mars the pressure is 6 millibars or 6,000ths of a bar. If we ask the question: what is the vapour pressure of CO_2 at -130 degrees. You guessed it, the answer is 6 millibars. This means the atmospheric pressure on Mars is determined by the temperature of the coldest place. If we increase the temperature of the poles in some way then the pressure increases through evaporation of the polar carbon dioxide. Amateur astronomers have been watching this phenomena every time they see the Martian poles shrink in summer and grow in winter. As Mars orbits the Sun, the amount of energy falling on the poles is slowly changing and thus carbon dioxide is being either evaporated or condensed at the poles. The atmospheric pressure must therefore be changing. I wonder if this has anything to do with the global dust storms Marina 9 witnessed when it arrived at Mars. Next time you look at Mars, just note those polar caps Mars' fossilized atmosphere.



CRANBOURNE METEORITES.

Just on the Dandenong side of Cranbourne there is a small park with a display of models showing various meteorites found in the Cranbourne during the past century. It is thought that some 25,000 years ago the Cranbourne area was peppered with meteoritic material from a large impact. While no crater is found almost 10 tonnes of material has been removed over the years. Some actual meteorites are on display at the Cranbourne Council Offices and the Melbourne Museum. The rest is spread around the world.



LIGHT POLLUTION LIMITING MAGNITUDE SURVEY

A SPOT ON THE MAP.

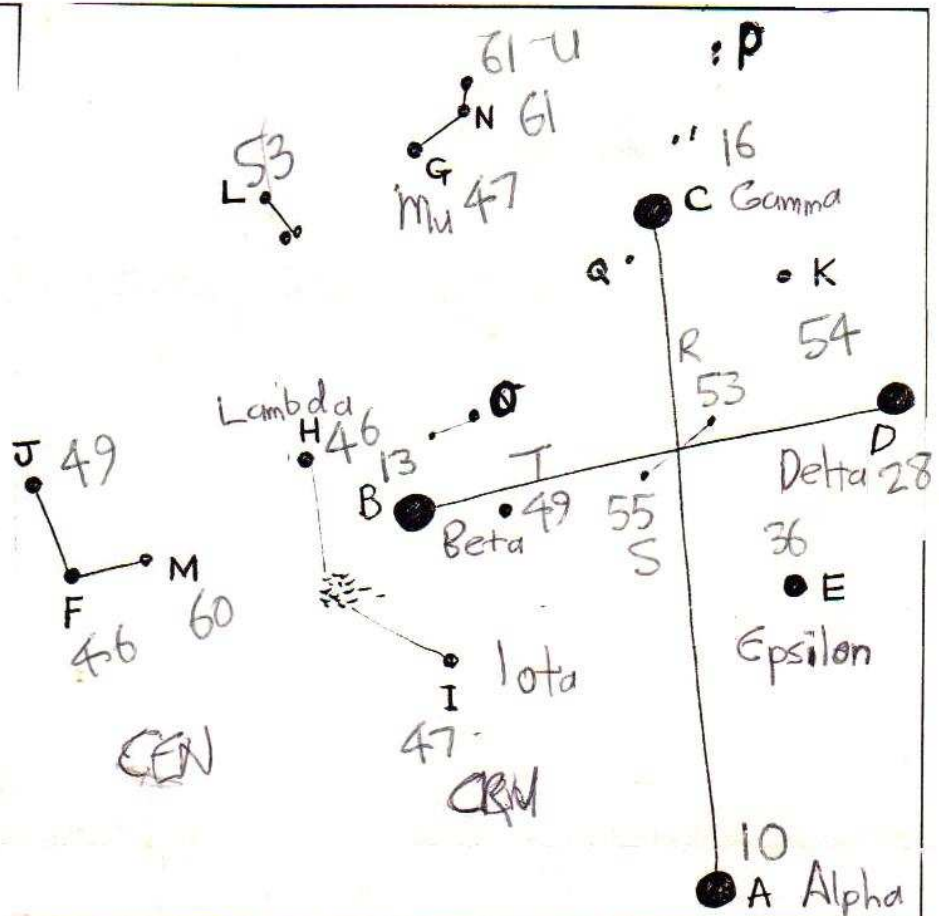
For all budding astronomers (and even those who have flowered and gone to seed) here is an opportunity to participate in a statewide survey on the darkness of our night skies. The only equipment you need is a pen and paper and your eye's - simple!!

The aim is to determine the faintest star you can see unaided. This is part of a programme being run by the ASV to monitor the effects of increasing light pollution around the state, in particular about the cities. Your contribution is crucial because we need to get measurements from as many locations about the state as possible. Remember light pollution in you backyard is slight different from someone else's and only you can measure it in you backyard.

Before making your contribution to the survey, go outside and allow at least 15mins for your eyes to adapt to the dark (longer would be better). Look at the Southern Cross and Pointers then indicate which star on the map you can or cannot see. The stars shown get fainter and fainter in the alphabetical order A to B to C etc. You might like to cross out each star as you spot it. For the fainter stars you may have to use "averted" vision. This merely means looking to one side of the star while concentrating on the star anyway. Personally, I find looking above the star better. This method enables the eye to see fainter objects than are visible by looking directly at them.

When you have done this, simply fill out the questionnaire and return it to me or post it to the Societies P.O. box. If you are unable to fill a section in, do not worry about it - leave it blank. These results will be passed on to the ASV so as to eventually prepare a map of Victoria showing contours of sky brightness. You will then have proudly contributed your won "spot" on the map for posterity

Peter Skilton



QUESTIONNAIRE

Date: _____ Time: _____ Name: _____
 Age: _____ Sex: Male/Female _____ Eyesight: _____

Place of Observation

be as specific as possible so it can be located on a map. Latitude & Longitude or Melways map reference.

Comments on the Location

e.g. one streetlight 50 meters away/ next to highway/etc

Comments on Sky Conditions,

eg thin clouds and some haze but normal for this location

Observing Experience of Observer

eg first time I have ever looked at sky/ experienced planetary observer/etc

OBSERVATION

Star Limiting Magnitude Estimates:

(eg I can see stars A,B,C,D,E, but cannot see others even with averted vision)

Background Magnitude Estimates:

(eg I can see the Milky Way stretching from South Horizon to overhead)

Remember, if you travel as part of your work, or you go on holidays, then why not make a 15 minute estimate there and help complete the map.

